What Does Credibility Feel Like? The role of emotion in undergraduate students' credibility judgments of online information

Anna Couch

School of Information Studies

McGill University, Montreal

August 2023

A thesis submitted to McGill University in partial fulfillment of the requirements of the degree of Doctor of Information Studies

Table of Contents

List of Tables

List of Figures

Abstract

Judging the credibility of online information presents one of the more daunting challenges to Internet users, made evident in the discourse around fake news, alternative facts, and bias dominating our personal, social, and political lives. Our study aims to broaden the theoretical lens looking at Internet credibility by examining how *emotion* may be influencing undergraduate students' credibility judgements of the information they find online. Library and Information Studies (LIS) has been exploring the role of affect in information behaviour (IB) for decades (e.g. Kuhlthau, 1991; Chatman, 1996; Nahl, 2007; Lingel and boyd, 2013; Savolainen, 2015; Willson and Given, 2020). However, little is known about the role of emotion in credibility judgements, pointing to a gap in our understanding about how these judgements are made.

Our study asks *to what extent* and *how* emotion may be influencing credibility judgements of online information related to health, news, leisure and academics. Specifically, we investigate whether emotions contribute *important information*, whether they *help or hinder* judgements, and what *characterizes the situations* in which they influenced judgements. We use in-depth, semi-structured interviews of 18 undergraduate students varying in age, gender, faculty of study, and residency status, reporting general behaviours and descriptive narratives regarding their judgements. Analysis using Hilligoss and Rieh's Unifying Framework of Credibility Assessment (2008) and Schwartz's (2012) Feeling-as-information theory led to findings that emotions were important factors in credibility judgements, influencing them in several ways and situations.

We found 33 distinct emotions showing a large variety of emotional experiences during credibility judgements. Because of this variety, we use a dimensional approach to help with some of the analysis, specifically, the valence (positive or negative) of emotions (Scherer, 2005). We found that emotion influenced credibility judgements by contributing important information during systematic processing of cues, establishing and reenforcing heuristic rulemaking, and defining constructs of credibility. Using concepts of integral and incidental emotion (Lerner et al., 2015), we also found that emotions were influencing judgements through the overarching context.

We found that emotions could be both helpful and hindering to credibility judgements, depending on various situational factors, including the information topic. Our participants had varying levels of awareness and understanding regarding the role their emotions had in their own credibility judgements, and this awareness contributes to how helpful or hindering emotions can be in credibility judgements, including their ability to manage emotions during credibility judgements. This finding makes a case for including emotional competencies in educational programs that wish to improve undergraduate information and media behaviour and literacy. We recommend further research that considers individual user attributes, such as emotional intelligence and awareness. We also recommend a deeper look into how emotion may influence credibility based on dimensions beyond valence. We ground our findings theoretically by using them to extend Hilligoss and Rieh's Unifying Framework of Credibility Assessment to include emotion as part of its structure, finalizing our study aim.

Résumé

Juger de la crédibilité de l'information en ligne représente un défi d'envergure pour les utilisateurs d'Internet, comme en témoigne le discours sur les fausses nouvelles, les faits alternatifs et les préjugés qui affectent notre vie personnelle, sociale et politique. Notre étude vise à élargir la perspective théorique sur la crédibilité en examinant dans quelles mesures les émotions influencent les jugements des étudiants de premier cycle sur la crédibilité de l'information qu'ils trouvent en ligne. Le domaine de la bibliothéconomie et science de l'information explore le rôle de l'affect dans le comportement informationnel (IB) depuis des décennies (p. ex., Kuhlthau, 1991; Nahl, 2007; Savolainen, 2015; Willson et Given, 2020). Cependant, on sait peu de choses sur le rôle de l'émotion dans les jugements de crédibilité, ce qui limite notre compréhension de la manière dont ces jugements sont rendus.

Notre étude examine comment les émotions peuvent influencer les jugements de crédibilité de l'information en ligne liée à la santé, aux nouvelles, aux loisirs et aux universitaires. Spécifiquement, nous examinons dans quelles mesures les émotions apportent des informations importantes, si elles aident ou entravent les jugements, et ce qui caractérise les situations dans lesquelles elles influencent les jugements. Nous avons recours à des entrevues semi-structurées approfondies auprès de 18 étudiants de premier cycle (de différentsâges, sexes, statuts et domaine d d'études) en faisant état de comportements généraux et de récits descriptifs concernant leurs jugements. L'nnalyse, basée sur le modèles de Hilligoss et Rieh Unifying Framework of Credibility Assessment (2008) et de Schwartz (2012) Feeling-as-information theory, a mené à la conclusion que les émotions étaient des facteurs importants

dans les jugements de crédibilité, les influençant de plusieurs façons et danss diverses situations.

Nous avons dénombré 33 émotions distinctes montrant une grande variété d'expériences émotionnelles pendant les jugements de crédibilité. En raison de cette variété, nous utilisons une approche dimensionnelle dans l'analyse, en particulier selon la valence (positive ou négative) des émotions (Scherer, 2005). Nous avons constaté que les émotions influençaient les jugements sur la crédibilité en fournissant des renseignements importants pendant le traitement systématique des indices, en établissant et en renforçant les règles heuristiques et en définissant les concepts de crédibilité. En utilisant les concepts d'émotion intégrale et accessoire (Lerner et coll., 2015), nous avons également constaté une influence émotionnelle dans le contexte global.

Nous avons constaté que les émotions pouvaient à la fois être utiles et nuisibles aux jugements de crédibilité, selon divers facteurs situationnels, y compris le sujet de l'information recherchée. Nos participants avaient des niveaux variables de conscience et de compréhension du rôle que leurs émotions avaient dans leurs propres jugements de crédibilité, et cette conscience contribue à la façon dont les émotions peuvent être utiles ou entravant dans les jugements de crédibilité, y compris leur capacité de gérer leurs émotions pendant les jugements de crédibilité. Cette constatation plaide en faveur de l'inclusion des compétences émotionnelles dans les programmes éducatifs qui souhaitent améliorer les comportements informationels au premier cycle. Nous recommandons des recherches plus poussées qui tiennent compte des attributs individuels des utilisateurs, comme l'intelligence émotionnelle et la sensibilisation. Nous recommandons également un examen plus approfondi de la façon dont

l’émotion peut influencer la crédibilité en fonction de dimensions au-delà de la valence. Nous fondons nos conclusions théoriquement en les utilisant pour étendre le modèle de Hilligoss et Rieh en y incluant les émotions.

Acknowledgements

I would like to first acknowledge my thesis supervisor, Dr. Catherine Guastavino. Your insightful feedback and generosity with your time was integral to making this work a reality, thank you. I would also like to acknowledge the help I received from the other members of my thesis committee, Dr. Ilja Frissen and Dr. Joan Bartlett, who provided a critical perspective that played a formative role in this work. I would like to thank Dr. Kimiz Dalkir for opening the door and getting me started, and Dr. Jamshid Beheshti and the SSHRC funded Information Seeking Research Project team; work with this team honed my research skills and helped with my study design and recruitment. I would like to warmly acknowledge the support I received from my fellow PhD students, who provided me with inspiration, commiseration, and laughs, without which the daily life of PhD study would have been too quiet. I would like to also acknowledge the 18 undergraduate students who were willing to share their thoughts and experiences, the life and soul of this study.

Finally, I would like to thank my mother and father for supporting me, and most of all, K(A)OS, who helped me carry the weight of this endeavour more than I ever wished to ask. I do this for you and because of you, thank you.

1 Introduction

1.1 The Problem of Credibility in Online Information

Undergraduates are coming of age as our future leaders, experts, educators, and workers in a world with unprecedented dependence on digital, networked information. While negotiating their future roles, they are also in the vanguard of new information technologies, using them in all aspects of their lives while developing new information skills, knowledge, and attitudes. An important area of development is the ability to judge the credibility of information found online.

There is a growing concern in academic and popular discourse that misinformation is having a negative impact on our personal health and well-being, social lives, and political activities by confounding our ability to judge what is credible. Compounding the problem, researchers in Library and Information Studies (LIS) are showing gaps in undergraduates' ability to search for, process, and evaluate information in online contexts (Gross and Lantham, 2012; Kim and Sin, 2016; Saunders et al., 2017). However, as the drivers of new information technologies, it may also be said that undergraduates are *in the process* of reframing skills, knowledge, and attitudes to fit the evolving information landscape, a landscape in which professionals and students alike are sometimes considered novices. It is important that we have a comprehensive understanding of undergraduate experiences with online information, and perhaps consider whether instruments of measurement include all relevant components before we can understand where gaps exist. Our study will look at the role of affect[1] – specifically emotion - in credibility and credibility judgements of online information in various topics in order to better understand how the undergraduate population is adapting their skills, knowledge and attitudes toward information online.

[1] The term 'affect' is used in LIS research and literature and refers to the domain of feelings-based or non-rational cognitive processes in contrast to behavioural or rational processes (Kuhlthau, 1991). Research in Psychology has defined 'affect' as an umbrella term, under which emotion is a specific type (Scherer, 2005). We will clarify our use of 'emotion' in our Literature Review and Theoretical Framework chapter.

1.2 The Context of Credibility in Online Information

Online information landscapes have become far more fluid in structure; methods of judging credibility based on traditional media do not necessarily account for contexts where authorship, expertise, credentials, and affiliation are not easily verifiable. The checks and balances that pre-internet technologies normally employ, such as editors, peer reviewers, directors, producers, and professionally defined standards do not underlie the majority of sources found online. Indeed, in many online contexts, these methods of judging credibility are neither appropriate nor achievable: information for personal interests or relationships, for marginalized or subcultural groups, and topics not normally valued by traditional media outlets may not conform to the same ideas of credibility or lend themselves to the same methods of checking credibility. With the proliferation of non-traditional information sources, topics, and audiences, as well as the increased reliance on social media, users are modifying the manner in which they verify the credibility of information. This fact combined with the ubiquity of information technology in everyday life means that users are interacting with information in more ways than ever before. To examine new ways of judging credibility, LIS research needs to cast a wide net, one which encompasses all relevant considerations from the research conducted in the field of Information Behaviour (IB) thus far. Our study of the credibility judgements of undergraduate students will attempt to extend current credibility theory in order to examine the role of affect – more specifically emotion – as a key factor in how undergraduate students make credibility judgements online.

Affect has been playing a role in LIS from early on in the research (Kuhlthau, 1991; Nahl and Tenopir, 1996; Dervin, 1983, 1992; Wilson, 1997). Continued growth in interest about the role of affect in IB promises a broader perspective that may shed light on how undergraduates are coping with the evolving information landscape (Nahl and Bilal, 2007; Fulton, 2009; Lopatovska and Arapakis, 2011, Tsai, 2014; Savolainen ,2016; Hyvärinen and Beck, 2018; Willson and Given, 2020). Our study will consider the role of emotion in credibility and credibility judgments as a missing piece of a picture that exclusively rational models are unable to render. In using an approach that explores the possibility of emotion as a key component of credibility judgement, we investigate whether a current theoretical framework of credibility – Hilligoss and Rieh's

Unifying Framework of Credibility Assessment (2008) – could be extended to include emotion, and if this extension would reveal new insights into how credibility is judged online. Including emotion in prevailing frameworks would be an important advancement in credibility research as it would provide a more powerful lens by which to understand how users make credibility decisions.

Previous research on credibility has little mention of the role of affect or emotion in credibility decisions. However, research on decision-making in Psychology has shown a large amount of evidence that affect – specifically emotion - plays a crucial role in how we make decisions (Frijda et al, 1989; Damasio, 1998; Schwartz, 2012; Zeelenberg et al., 2008, Lerner et al, 2015). We propose that, as a type of decision-making about information, *judging the credibility* of information will also include emotion as a key component. The aim of our study is to understand how and how much emotions may be influencing credibility judgements of undergraduate students, thereby providing insight into how undergraduate students are adapting to new information landscapes.

Toward this aim, we have designed a qualitative study to dig deeper into the role of emotion in credibility judgements. Understanding how emotions factor into credibility decisions will fill a theoretical gap in knowledge about credibility that will have useful practical outcomes as well. We hope to provide information designers and educators with theory and practical insights that will consider the role of emotion in online decision-making around credibility.

1.3 Affect and Library Information Studies Research

We see our study as continuing the work of the 'user-centered revolution' in LIS, a change in focus by Computer Science and LIS professionals from more systems-based approaches to information research and development (Kuhlthau, 1991; Dervin, 1992; Nahl, 1997). Focus on the user has facilitated a deeper dive into individual attributes, such as personality (e.g. Sin and Kim, 2013). We see the exploration of the role of affect as bringing another important factor of the user experience into focus.

In our literature review chapter, we explore an 'affective revolution' growing from an interest in evolving information contexts and audiences; new information contexts provide the setting for reframing traditional models and ideas of information searching, information retrieval, and other LIS modalities. It is no coincidence that some of the more prolific researchers of affect and information also explored (and even spearheaded) Everyday Life Information Seeking (ELIS) (Savolainen, 1995), Internet information seeking (Nahl, 1998b; Kim and Allen, 2002), health information seeking (Veinot, 2009; Fourie, 2009), social information contexts (Fisher and Landry, 2007; Loudon et al., 2016), marginalized groups (Chatman, 1996; Lingel and boyd, 2013) and online social networks (Kim and Sin, 2013; Hyvärinen and Beck, 2018). The unstructured and social nature of the contexts explored in these studies have encouraged LIS researchers to question the traditional individual-cognitive approaches to understanding how we process information and explore social, psychological, and technical factors influencing how we search for, use, and share information (Talja et al., 2005).

Another key component in our study is the use of concepts and methods from Psychology, a discipline with strong empirical and theoretical exploration of the role of affect and emotion in decision-making. Several LIS researchers have identified the importance of drawing on this expertise to better understand how affect may be influencing decisions related to IB (Wilson, 1997; Nahl, 2007; Lopatovska and Arapakis, 2011; Savolainen, 2016). Credibility judgements are some of the most important decisions users make regarding the information they find. The choice of whether or not to use, share, or discard information depends on the decision to believe or trust that information. We use theory and concepts from decision-making and emotion research in Psychology to better understand the factors that lead to credibility decisions, as some of the more advanced research in the field of decision-making (Damasio, 1994; Frijda et al., 1989; Zeelenberg et al, 2008; Schwartz, 2012; Lerner et al., 2015).

1.4 Credibility and Emotion

The literature on credibility straddles LIS and other disciplines such as Communication, Organizational Management and Behavioural Psychology. Similarly to LIS research in IB, credibility research has demonstrated how newer information technologies and contexts are

changing the way users perceive and judge credibility in the digital age (Fogg and Tseng, 1999; Wathen and Burkell, 2002; Rieh and Danielson, 2007). Fitting with the *social turn* in LIS, credibility research was defined early on as a user-centred study: credibility is in the 'eye of the beholder' and is usually operationalized as what the user *perceives* as credibility, rather than any objective quality of the information itself (Fogg and Tseng, 1999; Flanagin and Metzger, 2000). Despite the focus on user perception, the prevailing research has yet to examine the role of emotion as a key attribute of the user, and as a key factor acting on credibility perception and judgement (Metzger and Flanagin, 2015). Research from Psychology on the role of emotion in any kind of decision-making has shown emotion to be critical in understanding how we perceive information and make judgements about it (Schwartz and Clore, 1983; Lerner and Keltner, 2000; Zeelenberg et al., 2006; Schwartz, 2012; Lerner et al., 2015). There has been exploration of dual processing - particularly *heuristic* processing - in credibility research, suggesting a trend toward deeper understanding of affective aspects of user processing (Sundar, 2008; Hilligoss and Rieh, 2008; Flanagin and Metzger, 2007; Metzger et al., 2010; Metzger and Flanagin, 2013).

Also similar to LIS research trends, credibility research emphasizes how technological and media-based changes in how information is produced and shared have created a whole new set of factors in credibility (Fogg and Tseng, 1999; Flanagin and Metzger, 2000; Wathen and Burkell, 2002). Conceptual frameworks of credibility have integrated the user and various *components* of information, modeling the interaction between the user and multiple technological and media-based factors external to the user, but which influence how credibility is perceived (Wathen and Burkell, 2002; Rieh and Danielson, 2007; Sundar, 2008; Hilligoss and Rieh, 2008). It is perhaps because of the focus on the relationship between user perception and objective aspects of credibility that more detailed modeling of user attributes, including affective ones, have yet to be explored, with some exception (e.g. Hilligoss and Rieh, 2008; Metzger and Flanagin, 2015).

Hilligoss and Rieh's Unifying Framework of Credibility Assessment centralizes the user's credibility processing at three levels of cognition from basic interactions with information

objects to heuristic processing using rules, to high-level defining of constructs (Hilligoss and Rieh, 2008). The framework provides a versatile scaffold by which to explore the role of emotion as a possible part of the process of making credibility judgements. It also provides for the influence of 'context' or situational factors, which may further influence the user's judgement of credibility. Our study will examine whether emotion would fit into this framework as an integral part of credibility conceptualization and processing.

1.5 Population and Methods

Undergraduate students are a select group of younger adults, usually aged 18-24[2], who represent the next leaders in industry, policy, education, and research, and as such are an important group to understand in terms of IB. While undergraduate students do not represent the entire population of their age-group, economic class or educational background, undergraduates as a group are representative of younger adults from all over the world. Our cohort is from McGill, a large, well-established university in Canada with a substantial international population. Undergraduates also exist at a place where they are both driving the newest information practices and trends but still under the influence of authority and expertise outside their own experience.

There have been a number of studies of how undergraduates judge the credibility of information online (Metzger et al., 2003; Kim and Sin, 2011; Kim et al., 2014; Kim and Sin, 2016, Beheshti et al., 2018), however, none have looked closely at the role of emotion in credibility judgements. In addition, while many studies of undergraduates focus on academic information contexts, our study includes health, news, and leisure information in addition to academic information. In this way, we are able to compare the relative importance and influence of emotion in these various contexts.

This study uses a qualitative approach to provide in-depth analysis of the role of emotion in credibility judgements based on self-reporting by our participants. The study uses semi-structured interviews of 18 undergraduate participants in order to examine their reported

[2] https://www150.statcan.gc.ca/n1/pub/81-004-x/2010005/article/11386-eng.htm

general behaviour as well as specific narratives about judging credibility. We chose this method to best answer our research questions about the extent, importance, and role of emotion in credibility judgements within a variety of information contexts, and to ground our results theoretically by using them to extend Hilligoss and Rieh's Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008).

1.6 Organization of Chapters

Chapter 1: Introduction states our research problem and introduces some of the important literature and theory for our study, our study population, and a brief description of our methods. Chapter 2: Literature Review and Theoretical Framework contains the literature review section and subsections and the theoretical framework section and subsections. The literature review subsections situate where our study is drawing its theory and the gap in knowledge that it is addressing. As a contribution to the research of IB in LIS, we begin with the literature that addresses the role of affect or emotion in IB and to some extent Information Retrieval (IR) as well. We take a closer look at where this literature has begun to employ more theory and concepts from Psychology. We then discuss the literature specifically related to the field of credibility (and related concepts) and from here segue into credibility literature. Credibility is a topic that straddles LIS and other disciplines and thus is treated as somewhat adjacent to the core literature in LIS. We discuss the main concepts and theory from credibility research and note some issues with how credibility is conceptualized in the research. The Literature Review section concludes with a description of where emotion may fill a gap in knowledge regarding how credibility is defined and how credibility decisions are made.

The Theoretical Framework section gives the definitions and operationalization of our two key concepts: 'credibility' and 'emotion.' Definitions are followed by a description of Hilligoss and Rieh's Unifying Framework of Credibility Assessment, the main framework that we use in the study (Hilligoss and Rieh, 2008). This section also describes concepts and theory on decision-making and emotion from Psychology that we use to help design data collection tools and perform the analysis. The chapter concludes with our Research Questions and explanations, as well as the overall goal and objectives of our research.

Chapter 3: Methods describes our approach, sample, and data collection. Each section has subsections describing the overall approach, recruiting and sample description, interview guide development and testing, and coding and analysis process.

Chapter 4: Results reports the results of the interviews and analysis. Subsections are structured based on the components of Hilligoss and Rieh's framework in order to better illustrate and support how it may be extended to include emotion. Themes not directly related to the framework but help answer our RQs are reported at the end.

Chapter 5: Discussion and Limitations, has a section for the discussion of our results in answering our RQs, the extension of Hilligoss and Rieh's framework, and our Limitations. The discussion of our results is organized under each of our RQs and sub-questions to answer RQs. The second section has our recommendations for extending Hilligoss and Rieh's framework to include emotion. Recommendations for future studies or practical applications are made throughout the chapter. The final section describes the limitations with subsections relating to different design aspects as well as barriers encountered during data collection and analysis, and how these were addressed.

Chapter 6: Conclusion summarizes the findings in terms of key findings, which are mapped to recommendations for future research in the area of credibility and emotion. We describe how our results helped to address our research problem and serve our study population, as well as the theoretical contributions to credibility research.

2 Literature Review and Theoretical Framework

We begin our literature review by presenting literature on the evolution of *affect* and more specifically *emotion* in Library and Information Studies (LIS), with a particular focus on information behaviour (IB). For the purposes of our research, we use the term 'information behaviour' as a holistic term for behaviours including information seeking, searching, sharing, and creating, as in Björneborn's IB 'lifecycle' concept (Björneborn, 2011).

We then identify credibility as a concept that straddles multiple disciplines and make the argument for using credibility literature instead of similar concepts in LIS, such as *information quality* and *information relevance*. We present the literature on credibility and show a need for more research of affect and emotion in this area, demonstrated by a dearth of research with affect as a factor. We touch on literature from Knowledge Management on *trust* as a related concept when discussion *trustworthiness* of information. Finally, we demonstrate the precedent for and usefulness of leveraging the research on affect and emotion in decision-making from Psychology, which has developed methodology and theory for studying affect and emotion.

In our Theoretical Framework section, we explain the specific theoretical approaches from the credibility and Psychology literature that we use to build our data collection methods and structure our analysis. We detail our definitions and operationalization of 'emotion' and 'credibility,' and describe the Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008), which we have used to structure our analysis. We describe our main concepts from Psychology, the feeling-as-information theory (Schwartz, 2012) and the concepts of incidental and integral emotions (Lerner et al., 2015). We finish the chapter by describing our research goal and objectives, and research questions and sub-questions.

The focus of our study is *emotion,* however, because *affect* is used as a general term for a variety of affective phenomenon in LIS literature (with some exception, e.g. Nahl and Bilal, 2007; Lopatovska and Arapakis, 2011), we do not make a strong distinction between affect and emotion until our Theoretical Framework section (2.2).

2.1 Literature Review

2.1.1 Information Behaviour and Affect

An interest in the role of affect in IB can be viewed as a natural development of the user-centred approach in LIS, and indeed many of the researchers espousing the user-centred approach have also pursued an interest in affect (Kuhlthau, 1991; Dervin, 1992; Savolainen, 1993; Nahl, 1997). A stronger focus on the user and their attributes reasonably leads to an interest in the affective dimension of the cognition and the behaviours of how individuals search for and use information (Dervin and Reinhard, 2007, Hartel, 2019). Nevertheless, the integration of affect and, eventually, emotion in LIS modalities has been slow (Julien et al., 2011, Fourie and Julien, 2014, Krakowska, 2020). Our review of the literature in LIS shows both a trend of early adoption as well as a slow uptake of affect in models and theory of IB. We view those researchers who first considered the importance of affect in IB as pioneers of affect in LIS (e.g. Kuhlthau, 1991; Wilson, 1997; Nahl and Tenopir, 1996).

We also noted that researchers who focused on new information genres and contexts, such as the development of Internet-based technologies, information beyond academic or work-based contexts, and social information structures also seemed to find an interest in the role of affect (e.g. Savolainen, 1996; Nahl, 2004, 2005; Fisher and Landry, 2007; Veinot, 2009; Laplante and Downie, 2011; Lingel and boyd, 2013; Lueg, 2015; Loudon et al., 2016; Floegel, 2021).

2.1.1.1 Early Adopters

Affect in IB has played a role in frameworks and models in LIS from an early stage. Affect has been included in seminal models such as Dervin's Sense-Making model (Dervin, 1992), Kuhlthau's Information Search Process (ISP) (Kuhlthau, 1991), and Wilson's Model of Information Behavior (Wilson, 1999). Dervin was an early recognizer of the role of emotion in her Sense-making model, and later proposed several 'theoretical thrusts,' or mini-models showing a variety of ways in which emotion may influence IB (Dervin and Reinhard, 2007). Kuhlthau, whose work was based on Dervin's Sense-making model, was the first to include affect as a pervasive, continuous factor operating throughout her Information Seeking Process (ISP) model (Kuhlthau, 1991). Her study was also one of the first to establish affect in a model

using empirical evidence inductively as opposed to theoretical deductions. Wilson pushed the inclusion of affective concepts in IB by including a theory of stress and coping from Psychology in his comprehensive Model of Information Behavior (Wilson, 1997, 1999), opening the way for interdisciplinarity and a more sophisticated understanding of affect. However, affect was limited to the activation stage in his model, even though his model was comprehensive and potentially had more places for affect to be included. Wilson does state that there are areas for theoretical expansion in his model, such as his 'information processing and use' box, where credibility judgements would likely be located (Wilson, 1999). He also states that 'stress and coping' may not be the only Psychology theory that could fit the model, but exploration of risk-reward (where much of the work on emotion and decision-making has focused) could also yield interesting results.

Despite the early interest in affect amongst leading LIS researchers, Julien et al. (2011) note in their review of LIS trends in IB research, very little changed with respect to affect in the research from 1999 to 2008. According to their analysis, affect was considered mainly in academic journals, from a theoretical perspective; very little of this work was being integrated into practice or being researched empirically. One of the few affective concepts to directly influence the professional sphere of LIS researchers was Mellon's library anxiety (Mellon, 1986), which was found to be a formidable barrier in academic information searching. The outcome of this research influenced library practices and research ubiquitously (Gremmels, 2015). A later paper by Fourie and Julien calls for a research agenda that includes a more vigorous approach to affect in various foci of LIS research (Fourie and Julien, 2014). Krakowska's more recent review of IB literature from 2014-2020 makes a similar call for more vigorous treatment of affect and emotion in LIS drawing on theory and methodology from Psychology and other interdisciplinary approaches (Krakowska, 2020). Some LIS researchers have begun to heed this call to interdisciplinarity in their research, with many including theories and concepts from Psychology to characterize affect, although with somewhat more focus on methodologies than theory (Nahl, 2007; Lopatovska, 2014; Zanghaneh and Hariri, 2019).

Nahl's early interest in affect – and later emotion – appears to be rooted in her interest in the user-centered paradigm, similarly with other early adopters (Dervin, 1992, Nahl, 1997). Her co-authored empirical study of seven academic users querying databases found three 'affective user variables' anchored throughout the search: purpose, motivation and satisfaction, based on user comments (Nahl and Tenopir, 1996). Nahl goes on to use concepts from Psychology, including appraisal theory, to support a more robust understanding of emotion as a key factor in IB, culminating in a model for affective and biological factors in IB (Nahl, 2007) and the first LIS book dedicated to emotion in IB (Nahl and Bilal, 2007). In the book, Nahl and Bilal and contributing authors argue for a more central focus on emotion and affect in LIS research, and put forward a number of theoretical and empirical studies of emotion and IB. They also explore a variety of information contexts, including Everyday Life Information Seeking (ELIS) contexts and social information contexts (e.g. Fisher and Landry, 2007), and special populations (e.g. Hayter, 2007).

Overall, it appears that the interest in affect and emotion has grown with a diversification of research into other information contexts beyond the academic, such as workplace IB (Byström and Järvelin, 1995; Lloyd, 2009), social information spaces (Fisher and Landry, 2007), health information (Veinot, 2009) and Everyday Life Information Seeking (ELIS) (Savolainen, 1995). There is reason to suppose that these developments are linked: a growth of interest in new contexts may have led to a growth in new factors that characterize new contexts, particularly social ones. Alternatively, a diversification of contexts may have amplified the focus on the user as the central player in whatever context, sparking a need understanding psychological aspects of the user (Hartel, 2019). It is possible that Nahl's early interest in the user-centred approach may have led to an interest in affect in IB in a similar way that Savolainen's interest in ELIS led to his interest in affect in IB (Savolainen, 2014; Savolainen, 2015a; Savolainen, 2015b, Savolainen 2016). Similarly, Fisher's interest in social information spaces (Fisher writing as Pettigrew, 1999) may have led to her later interest in emotion and IB (Fisher, Landry, and Naumer, 2007; Fisher and Landry, 2007). As an exploratory study of emotion in IB, we look across a range of contexts and online technologies, with a focus on the user as the centre of IB, considering the role of emotion as a key user attribute.

Arguably the most pervasive contextual change in information behaviour has been the development and growing dependency on Internet-based information technologies. More than a distinct 'context' like a place or group or topic, online technologies integrate all these things into new socio-technical configurations that draw on many of the developments mentioned above (e.g. social spaces, ELIS) and introduced new factors, such as a lack of traditional media structures and credibility markers, and the amplification of information sharing and creation as a key part of the landscape. As our study focuses on information found online, we make a distinction in our literature review and our study design that presumes the binary of 'Internet-based' (online) information and 'in-person' information that is more conceptual than practical. We recognize that more and more, discussions of information contexts need to allow for some complexity and hybridity in terms of how information is created and shared (Floegel, 2021; Given et al., 2023). In the following sections we discuss the evolution of various contextual factors that were felt to have influenced how affect and emotion were considered in IB, including, but not exclusive to the role of Internet-based technologies.

2.1.1.2 Evolving Contexts – Internet-based information technologies

As noted in the last section, the growth of Internet-based technologies is not a separate development to other information context developments, but rather may have introduced new factors and complexity to the discussion of information and affect. Researchers examining affect point to the lack of structure of information on the Internet as a factor in affective IB, and that differences in individual attributes would be amplified in these contexts (Nahl, 1998b; Nahl, 2004, Nahl, 2005; Savolainen, 2007; Kim, 2008). In Nahl's review (1998b) of survey and ethnographic research on new adopters of Internet information technology, she calls for an awareness by designers to integrate user-centred approaches into their designs that acknowledge individual differences and affective factors. In subsequent research, Nahl advanced IB theory regarding affect with her work on measurement of affective factors in web searching in college students (Nahl, 2004, 2005). These studies begin to flesh out some of the cognitive, affective, and sensorimotor domains in IB, and emphasise the continuous influence of affect in every aspect of IB: "By definition, all information behavior, no matter how small or partial, must be driven by a feeling-motivation, or else the behavior stops and is replaced by

another behavior driven by some other affect or goal-feeling" (Nahl, 2004, p.192). Her definition of affect here draws on well-known Psychology-based concepts of emotion as goal-orientation and prime motivator (Frijda, 1989). In the first study of 73 college students performing 10 web search tasks, Nahl develops a rating system of several measures of a user's affective experiences drawn from the literature, including task completion motivation, uncertainty feelings, time pressure, affective load, self-efficacy feeling, search optimism feeling, user coping skills, evaluation of search episodes, and acceptance of search environment. Nahl's resulting Affective Load Theory (ALT) is a trade-off of positive affective experience (optimism, coping skills, self-efficacy) over the negative ones (uncertainty, time pressure). She shows that successful searching is dependent on the user's ability to coping with negative affective experiences, which otherwise stop the information seeking/searching process. She attempts to further her theory in a subsequent study of 55 college students performing more complex web information tasks during a course, using a similar rating system to measure various affective dimensions. She found similar outcomes as her 2004 study, that positive affective experiences such as optimism and self-efficacy helped counteract negative affective experiences, even over long term. She also found that there was an interaction between affective and cognitive experiences, with higher affective coping skills (optimism and self-efficacy) benefitting those with both high and low cognitive abilities. Her study helps to support arguments showing that *affect* and *cognition* interact.

Kim's experimental study of 67 undergraduate students looked at their 'emotion control,' a similar concept as Nahl's affective coping skills, although for Kim emotion control is a user attribute rather than a part of the search process (Kim, 2008). Emotion Control was measured as Personal Control (PC) a measure from a Problem-Solving Inventory (PSI). Her study looked at the impact of emotion control as well as search task type (general and specific) on search behaviours and search performance. Search behaviours were measured by the number of times the search tool was used and search performance measured by completion time and precision. She finds that emotion control and task type have a strong impact on user behaviour and their ability to search for information effectively, although less impact on performance. She also found a possible interaction between emotion control and task type, finding that users

with low emotion control used much less effective search behaviours on general tasks than specific ones, although the finding was not significant.

Online commerce shows the intersection of technology and spending money, an often stressful and emotion-ridden process. Literature from Marketing and Advertising has recognized the importance of emotion since the 80s and have drawn heavily on theory and concepts from Psychology to understand people's purchasing behaviour (Dewitt and Poels, 2019). Landry's dissertation uses semi-structured interviews and observation to look at affect factors in high stakes purchasing (homebuying), using an experimental ersatz homebuying experience (Landry, 2014). She found that emotion was related to time-pressure and influenced whether and how information was used and shared with others. Landry considers several decision-making theories from Psychology as a justification for looking at emotion in decision-making (similarly to our study), but uses LIS theory for her theoretical approach, specifically Chatman's Theory of Normative Behaviour (Chatman, 2000) and Fisher's Information Grounds (Pettigrew, 1999).

The research exploring Internet-based search behaviour and affect shows that the higher complexity environments of the Internet seemed to be augmenting and amplifying some of the already known impacts of affect and interactions with cognition and behaviours. Subsequent research exploring the Internet in general as well as other more complex information contexts – such as everyday life information seeking (ELIS) and social information contexts – would further explore and expand the notion of affect as a key factor in IB.

2.1.1.3 Evolving Contexts – Everyday Life Information Seeking and Social Information

Savolainen originally defined Everyday Life Information Seeking (ELIS) negatively, as those contexts which are *neither* academic *nor* work related, creating a conceptual space for future researchers to fill with myriad information contexts (Savolainen, 1995). For Savolainen, ELIS was a space for 'mastery' of life, a highly cognitive and rational framework for ordering and prioritizing information needs related to personal improvement. Everyday life information seeking (ELIS) expanded in definition with the rise of interest in social spaces of information (e.g. information grounds) and the rise in ubiquity of Internet-based technologies as a tool for managing life's information needs. As ELIS-based research progressed, contexts began to be

defined more often by reconfigured structure and increased complexity in social dynamics (Floegel, 2021; Savolainen, 2022).

Social interactions are laden with emotions, both felt in the user and embedded in information content; similarly, unstructured or reconfigured information spaces can evoke strong emotional responses in the user (Savolainen, 2016). For these reasons, ELIS has been fruitful for the study of affect and emotion, as evidenced by the inclusion of affect in a variety of ELIS topics, including parenting (Fisher and Landry, 2007; Loudon et al., 2016), commerce (Landry, 2014), hospitality (Gursoy, 2018), hobbies (Fulton, 2009), music (Laplante and Downie, 2011), and even less mainstream activities such as body modification (Lingel and boyd, 2013) and pornography (Keilty, 2012). Internet technologies furthered growth and visibility of new information contexts by providing information spaces that were accessible, different-structured, anonymous, creative, and user-driven, among other factors (Floegel, 2021). The access to information afforded by Internet technologies has also provided LIS researchers with new datasets about groups, topics, and behaviours that traditionally were more difficult to get.

Information Grounds, Small Worlds, and the Information Poor

'Information grounds' is a key concept from the LIS literature that looks at social structures of IB (Pettigrew, 1999; Fisher and Naumer, 2006). Information grounds emerges primarily from studies of real life IB (not computer-based or web-based), where information environments are social, complex, and iterative. Fisher and Landry's study of mothers' IB uses 'information grounds' to illustrate how contexts with socially based structures are often also contexts that elicit emotions (Fisher and Landry, 2007). Fisher and Landry observed 20 stay-at-home mothers at support groups and later conducted interviews, finding evidence that affect influenced the mothers' IB, including motivation to search or share and several other aspects. This study was also one of the first to include distinct emotions in their findings; they found evidence of 24 distinct emotions felt during information searching and sharing.

Chatman's Small World and Information poverty theories posit that some isolated or marginalized groups have limited or limiting IB, either because they choose to favour information from their 'small world,' or because their worlds are made small by stigmatization,

which limits them from participating in societally normalized information venues and practices (Chatman, 1991; 1996). As a result, they will either have unfulfilled information needs or in some cases seek out alternate or underground information sources for their needs. Affective factors characterize limits and barriers to IB, such as fear of judgement, suspicion of others, desire for anonymity, and affinity to likeminded information sources. Lingel and boyd (2013) use Chatman's 'information poverty' theory to investigate privilege and marginalization in the information contexts of sub-cultures. The authors look at the social dynamics of body modification groups and how they share, or do not share, information. Information poverty elicits emotions of fear of judgement, suspicion, and anxiety while individuals try to find information and hide their intent at the same time, to avoid social stigmas or illegality of their pursuits. In these situations, emotions influence motivations to seek and share information in an overt way, according to the authors, and should be considered in models that wish to reflect the IB of the marginalized or the information poor. Although information grounds, small worlds, and information poverty all began from real life information contexts, they have since been applied to online social network contexts. Loudon et al.'s study of first-time mothers' information-seeking in an online forum uses information grounds (Pettigrew, 1999) and Chatman's information poverty and small worlds theories; they found that fear of others' judgement kept them from accessing their family and peer networks.

Social media exemplifies intersection of social space and technology. Social media has been highlighted as a context in which emotion plays a significant role in how information is shared and processed; this is not surprising as it combines Internet technologies with social contexts, both identified as emotion-stimulating contexts. Sin and Kim (2013) look at the online social network ELIS of international students; they consider personality (as measured by a 'Big 5' personality inventory) and found that extroverts were more likely to use social networks than introverts and found no effect for the other 4 traits; this shows that personality may not be the most interesting affective aspect to investigate in future studies, although it may also point to the need for a different type of personality inventory, such as the Myers-Briggs Type Indicator (MBTI). A more recent analysis (Hyvärinen and Beck, 2018) of the literature on emotion and social media studies notes that there has been a sharp increase in studies since 2011, proving

that the topic of emotion is growing in relation to online information, and that, again, it is the social nature of this information that seems to amplify the role of emotion, compounded by the lack of cohesive structure on the internet.

Embodiment and Pleasure in Information Seeking

The concept of embodiment in information gained interest in studies of situated information or information practice in information literacy (e.g. Somerville and Lloyd, 2006; Lloyd, 2009). These started almost as antithesis to online information contexts, where information was sought and shared through interactions between the body and the workplace and between bodies, and has developed in that vein in some research, for example, research the looks at communication with animals (Solhjoo, 2022) and often considered in health information research, between caregiver and patients (Huttunen, 2023). However, even when applied to online or digital information contexts, embodiment becomes a key factor in leisure IB, and takes on a decidedly affective quality in the concepts of pleasure and enjoyment in information seeking found by several researchers of hobbyists and pleasure-seekers on and offline (Fulton, 2009; Laplante and Downie, 2011; Keilty, 2012; Lueg, 2015; Cox et al, 2017).

Fulton (2009), Laplante and Downie (2011), Keilty (2012) and Lueg (2015) argue that traditional IB models emphasize the link between needs and outcomes, ignoring the importance of the body and feelings of pleasure in the information seeking/search process. Their research uses embodiment to help develop leisure or hobby information contexts, a type of ELIS that may be distinct from other everyday information types, such as shopping or planning one's daily activities. For example, the search for shopping information is usually initiated by a specific need (e.g. best price for shoes) that is only satisfied (or not) by the outcome of the search (finding shoes at best price – or not), whereas the information searching itself can be the need and outcome in a leisure context. This implicates the affective profile of information searches as well, which would look markedly different from those that emphasize needs and outcomes. Fulton examines the idea of leisure information seeking/searching as inherently pleasurable and forwards that LIS should be considering affect beyond stress/coping and other negative affective experience such as uncertainty and frustration that have characterized need-and-

outcome based searching (Fulton, 2009). In her study of amateur genealogists, she finds that they associate pleasure with the information seeking process itself, and that this may help explain patterns of behaviour not explained in traditional models that focus on outcomes, such as wanting to delay the outcome in order to prolong the pleasure of searching.

Keilty comes to a similar conclusion in his analysis of Spink et al.'s exploratory study of sexual information seeking, which found that sexual information seeking took longer and more effort than non-sexual information seeking (Spink et al., 2004; Keilty, 2012). Spink et al.'s paper emphasizes the importance of considering sexual information seeking/searching as different than other ELIS models, because this type of searching involves very different behaviours, for example, more interactions and longer time spent on certain sites compared to other ELIS searches (Spink et al., 2004). Keilty uses two theories from Psychoanalysis – Lacan's theory of desire and Freud's theory of cathexis – in his analysis of Spink et al.'s findings and concluded that the differences in search behaviours were because sexual information searching takes on a different set of goals than regular searches, including the delaying of satisfaction and enjoyment of the seeking activity itself. The importance of more passive forms of searching such as encountering, scanning and serendipitous seeking for their ability to invoke pleasure is a contribution of this research, and draws attention to the fact that the direct needs-to-outcomes modeling that may be appropriate in academic contexts does not always explain observed IB in other contexts.

Laplante and Downie's study of young adult music enthusiasts uses a new approach to the concept of 'satisfaction' in online shopping behaviour to show that music information searching/seeking can be for both utilitarian (acquiring music and acquiring information about music) and hedonistic purposes (feeling of engagement, pleasure), allowing for an affective and cognitive dimension (Laplante and Downie, 2011). Their definition shows that 'satisfaction' had hitherto been vaguely associated with affect without having a strong affective definition: by showing that 'satisfaction' can be both utilitarian and hedonic they have made a clearer distinction between satisfaction part of an affective process as opposed to a cognitive process. Leisure research continuous Kuhlthau's ISP findings, that there is an affective dimension throughout IS and this may implicate many more affective expressions than first imagined.

2.1.1.4 Health Information

Health information was recognized early on as a context that implicates affective or emotional factors (Wilson, 1997). Pettigrew's information grounds theory, which found that affect was a key factor in information sharing, emerged from a study involving staff and patients at a foot health clinic, (Pettigrew, 1999). In spite of, or perhaps *because of* the inherent importance of emotion in health information, it has also been reported as emerging slowly in the field. Fourie's review of emotion in health information from 2004-2008 showed that emotion received relatively little attention in the literature, despite influencing multiple aspects of health IB (Fourie, 2009). Veinot's study of AIDS/HIV patients' IB spring-boarded a stronger interest in affect in health information contexts by demonstrating the importance of emotional support expressed through information sharing in friend and family networks (Veinot, 2009). Like the small or impoverished information worlds of parents and marginalized groups, health information contexts are often characterized by emotionally charged barriers to IB, and therefore, modeling of this IB requires acknowledgement of an affective dimension (Godbold, 2013). Studies have often found that aversion to searching or sharing health information resulting from the experience of stress and other negative emotions, which has created significant barriers to information access (Lee et al., 2008; Anderson and Agarwal, 2011; Costello, 2016). However research looking at risk in health information has shown that certain positive emotions can also inhibit seeking, and conversely, certain negative ones can increase it, making it clear that a closer look at the role of emotion is needed (Griffin et al. 1999; Myrick and Willoughby, 2017). It has also been recognized more recently that not enough has been done to include emotion or affect in health information studies (Julien and Fourie, 2015). Since Julien and Fourie's review, research into emotion and health information has expanded greatly, presenting a new challenge of how to translate these findings into practical solutions for health information systems (Singh et al. 2019).

At the intersection of health information, information embodiment, and information poverty, recent research into queer and transgender IB has brought into critical view assumptions about sociotechnical structures that aim to normalize cis-gendered, heterosexual experience (Floegel, 2021; Huttunen, 2023). New assemblages provide new information pathways when normative

relationships are strained, as with patient-caregivers relationships. Huttunen's study of transgendered people in Finland seeking gender-affirming care uses the concepts of cognitive authority and triangulation to show how patients triangulate information from various sources, including their own bodies (embodiment), to work around caregivers, who are felt to have bias or lack of knowledge about transgendered bodies and care (Huttunen, 2023). Huttunen expands the concept of cognitive authority to include one's own embodied feelings as a key source of information in health decision-making about health.

2.1.1.5 Affective Elements in IB models

Affect has taken a number of forms in IB models, from specific roles as with stress and coping in Wilson's Model of Information Behaviour to more permeating influence, such as Kuhlthau's ISP (1991) or Nahl's Socio-biological Technology model (2007). Kuhlthau laid the groundwork for understanding affect as a continuous dimension of IB separate from cognitive and behavioural dimensions in her ISP model. However, models need to be able to look closely at the interactions among various factors including affect, in order to see how affect influences decision-making and actual behaviour. Kuhlthau's model is also limited to linear academic search contexts and does not address more nebulous tasks and structures in social, online, and ELIS contexts.

On the other hand, Pettigrew's Information Grounds model is completely non-linear, allowing for interactive, iterative information practices that are social in nature (Pettigrew, 1999). Emotion is a key factor in how and why information is shared in the Information Grounds, as part of 'caring' or support during information exchanges. Research using this type of iterative model often emphasizes affective aspects of information sharing but are not easily able to focus a lens on particular IB activities, such as information selection or evaluation. Wilson's Information Behaviour Model (Wilson, 1997) focuses on important search initiation decisions and uses stress and coping theory as a lens to understand motivation to search. However, he does not include affective dimensions in any other aspect of his model. Griffin et al.'s Risk Information Seeking and Processing (RISP) model shows the influence of affect among other factors in health information seeking and processing, particularly with respect to motivation to

seek information as well as the processing of that information (heuristic or systematic). Yang and Kahlor, 2013 later use the RISP model to examine variations in individual behaviours, including how positive and negative affect influences risk perception using a survey of 736 students. They found that negative emotions about a risk topic (climate change) motivates information seeking in order for individuals to assess the imminence of the risk, while positive emotions demotivated information seeking, possibly in order to avoid any new information that may change their positive outlook (mood maintenance).

Dervin and Reinhard (2007) describe the multiple ways that emotion might plausibly influence IB, in their 8 'emotional thrusts' mini models. These are theoretical models developed in order to encourage a closer examination of the influence of emotion on particular aspects of IB, including contextual (model 1), to motivational (model 4) and informational (models 7 and 8). These mini models fit intuitively with some of the Psychology concepts that are used in this study, such as 'feeling-as-information' (Schwartz, 2012) (informational) and 'feeling-is-for-doing' (Zeelenberg et al., 2008) (motivational). They are not descriptive of any particular IB activity but provide many possible approaches to including emotion in the IB lifecycle.

Savolainen's more recent work has actively taken a closer look at emotion and motivation in IB by both analysing prevailing IB models that include affect (Savolainen, 2015b), as well as presenting his own conceptual model of emotion and its motivational effects on IB (Savolainen, 2014); he has not yet tested this model empirically. In his study of the discrete emotions expressed during information sharing among travel consumers, he uses Bale's Interaction Process Analysis, a model for studying problem solving in face-to-face groups (Bales, 1950; Savolainen, 2015a). Savolainen sets out to show how the expressions of certain emotions elicit emotions in respondents, who then share or don't share information. He acknowledges a number of issues in interpreting and coding emotions, such as drawn-out expressions of emotional nature that may or may not use discrete emotions terms, and uses a simplified coding for these, understandable in his admittedly more exploratory approach. One key issue with his approach is that it equates the emotion embedded in message content with actual experiences of emotion, which are not necessarily identical. He uses the content of the

messages (questions and responses) as a proxy for the actual emotion of the users at the time of reading the message and composing a response, when without observing the users, one cannot know what s/he was actually feeling as a result of reading a response and whether the user authentically transmitted that emotion through his/her response.

Nahl's Socio-biological Information Technology Framework (2007) integrates affect, cognition, sensorimotor, and technological dimensions into one continuous, iterative process of information access and evaluation. As far as IB models, it is the only one that ties affect and the evaluation together, along with a relationship to cognitive processes. However, evaluation here is not limited to the evaluation of information quality but of many aspects of the search process such as difficulty of search task, prioritizing, continuing to search etc. In her literature review, Nahl presents a broad analysis of different emotional theory in LIS including seminal research in Psychology on emotion and decision-making (e.g. Zajonc, 1984; Ortony et al., 1998; Scherer et al., 2001). Her framework models the interaction of technology, biology, and society, showing that they are highly iterative and co-dependent in IB. Nahl's framework is used to map the dynamic relationship among technological affordance, sensorimotor, affective, and cognitive aspects of 'spontaneous user discourse' to show how these systems are integrated in these informational interchanges. Her framework resembles some of the credibility frameworks we will see in the subsection on Credibility (2.1.4); the inclusion of 'affordances' and social contexts are also included in credibility models. Nahl's framework is considered an important example of how affect is a key ingredient of IB and the processing of information.

Willson and Given's recent study of academics produced a model that describes the influence of discrete emotions on IB (Willson and Given, 2020). This qualitative study of 20 academics looks at the link between emotional experiences in context (at work) and various aspects of their IB. Their work does not explicitly leverage theory from Psychology; however, their approach bridges easily to concepts such as appraisal tendency and dimensional models of emotion, which proport that individual emotions are characterized differently in their effects on thinking and behaviour (Frijda et al, 1989; Lerner et al., 2015)

2.1.2 Information Behaviour and Psychology

IB researchers are relying more readily on Psychology for definitions, concepts, and theories to investigate the role of affect in IB. The RISP model used the appraisal theory from Psychology to look at the motivating influence of positive and negative emotions on seeking information about risk (Griffin et al, 1999). This model has continued to be included in research aiming to explain individual variations in certain kinds of IB, showing a continuous trend to utilize Psychologic concepts in IB (Yang and Kahlor, 2013; Myrick and Willoughby, 2017). Lopatovska and Arapakis made this explicit through their comprehensive analysis of important concepts from emotion research in Psychology (Lopatovska and Arapakis, 2011). Their analysis of various approaches to studying emotion discusses how LIS modalities might employ them to study emotion in their own research contexts. Because of these two researchers, the IR domain of LIS has been relatively active in terms of using theory and methods from Psychology to research the role of affect and emotion relating to both information quality and information relevance. (Arapakis et al., 2008; Gwizdka and Lopatovska, 2009; Moshfeghi and Jose, 2013; Lopatovska, 2014; Zanganeh and Hariri, 2018).

Arapakis et al.'s experimental study of 24 undergraduate and graduate students explored affective feedback during the information seeking process in order to find where affect played a role in information searching and retrieval of relevant documents (Arapakis et al., 2008). By measuring 7 basic emotions using facial recognition techniques, in combination with search logging and self-reporting exit questionnaires, they found patterns related to task difficulty, as well as individual differences in patterns among participants. They concluded that affect interacts with cognitive processes throughout the seeking process, and that text complexity influences type and intensity of emotion. Although the task required that participants bookmarked relevant documents, there was no framework to associate emotional reaction to relevancy judgement itself (or any other particular element of the task), so it was not clear which emotions were experienced at which particular aspect of the search and selection. However, we can assume some of the emotions experienced were in reaction to their relevance judgements. From the self-reporting the most prominent emotions included frustration, happiness, sadness, anger, and surprise, in order from most to least frequent. An interesting

finding was the difference between the emotional information from the self-report and the face tracking, which showed surprise to be far more frequent than the other emotions, a different result than the self-reporting. Arapakis et al. do not discuss in detail this difference or what it meant to their findings or methodology. They do conjecture that the less frequently detected emotions from the biometric data might provide more accurate information, as they may indicate reactions to particular events.

In a study information retrieval of relevant documents, Moshfeghi and Jose (2013) observe the biometric data of 24 subjects in combination with their 'dwell time,' a typical behavioural factor of relevance assessment, for different types of searching intentions (information seeking, re-finding, entertainment). They found that biometric measures of affective response in combination with dwell time more accurately predicted relevance judgements, in the absence of task information, and therefore could be a proxy for task information; the study showed that affective factors can be predictive in relevance assessments, although the reliability varied with search intention.

Gwizdka and Lopatovska's experimental study of 48 students examined the relationship between various subjective (happiness levels, satisfaction with and confidence in the search results, feeling lost during search, familiarity with and interest in the search topic, estimation of task difficulty) and objective factors on search outcomes (search behavior, search outcomes, and search-task characteristics); search outcomes included relevance (Gwizdka and Lopatovska, 2009). Interestingly, they found that positive affective factors (feeling happy before search) did not necessarily lead to satisfaction or the selection of relevant information sources and suggested that negative affect may be associated with better outcomes. They suggest a deeper exploration of the relationship between affect and quality of outcomes, as it may seem intuitive that positive affect would promote better outcomes.

A somewhat more recent experiment from Lopatovska also explored the predictive power of measuring emotions in IB, focusing on 'search outcome quality' (Lopatovska, 2014). Her study of 30 participants uses data from 'primary emotions' (7 distinct emotions observed through real-time, facial detection methods), 'secondary emotions,' (those reported by participants

through interviews) and mood (using the Positive and Negative Affect Schedule (PANAS) questionnaire (Watson et al., 1988)). She found that primary emotions were more closely linked to search behaviours, and therefore could provide a proxy measure for behaviours and vice versa. While her findings for primary emotions were quite robust, she admitted her interview data was not. She indicated that this was a possible shortcoming of reporting, but it may also have been due to her interview approach. Her analysis relied on direct reports of emotion strength and used the video of the participant's search as a memory prompt, whereas more iterative, probing questions and self-reflection may have been needed for participants to access their deeper emotional memories. One important result that advances the research on affect and credibility was her grounded finding of another aspect of the information search process: assessment. This finding emerged from the interview data, showing that participants were more easily able to access their emotional reactions to assessment of the search process, including, outcome quality, revealing that assessment is a reflexive process, and that interview data is appropriate for analysis of assessment processes.

In a similar experiment, Zanganeh and Hariri's (2018) study of emotion and information retrieval of 50 PhD students performing academic and ELIS searches. They looked at emotions (happy, sad, neutral, angry, fear, disgust, surprise) taken from facial expressions during search tasks to look for correlations between emotions and individual characteristics (frequency of searching the internet, pleasantness of the search experience, interest in the search task, familiarity with similar searches, clarity about the search goal, and satisfaction with search results) and search performance (time spent on a search task, number of viewing hits, result pages requested per session, unique queries per session, pages (Google and non-Google) visited, time examining each search results' page) . Their analysis found a relationship between more happiness and disgust with reviewed hits, time spent on task and unique queries, while less happiness and more sadness and fear related to more reviewing results, but less unique queries and less time spent reading hits. This finding reinforces that that emotional valence may not be the only factor in performance (e.g. time reviewing hits, time spent on task), although likely plays a role in some (e.g. time spent reading). While none of these search

performance indicators is easily defined as evaluative, we see evidence of emotions to several closely related aspects of search performance.

The literature shows a definite trend toward focusing more on the role of affect with the increased attention to the impact of new, Internet-based information technologies in all aspects of our lives as well as the attention to more social information contexts. In keeping with this pace, research has looked to other disciplines such as Psychology for help with more in-depth concepts and methods for looking at affect and emotion in IB. The use of biometrics and self-reporting that examines discrete emotions, rather than vague affective factors such as uncertainty or need shows that LIS is developing stronger interest and stronger tools for including emotion in IB. It seems LIS may be answering Krakowska's call for more rigorous integration of affect in IB after all (Krakowska, 2020).

2.1.3 Information Behaviour and Credibility

The research on credibility straddles LIS, Organizational Management, Communications, and Behavioural Psychology (Rieh and Danielson, 2007). Credibility is not considered as often as closely related concepts, such as information evaluation, information quality, and relevance (Rieh and Danielson, 2007; Savolainen, 2011, Kim and Sin, 2011; Kim et al., 2014; Kim and Sin, 2016). In some studies of credibility, relevance is a key criterion, although not the only indicator of credibility (Wathen and Burkell, 2002); in others, credibility is a component of relevance (Rieh, 2010); in both cases, the concepts overlap, but are not identical. However, as we saw in the previous subsection, the literature on retrieval provides several useful examples of exploring the role of emotion in these kinds of decisions about information.

Information quality is often operationalized as objective *features* or *elements* of an information source (such as authorship) or its content (such as being up to date) that users consider when selecting an information source (Rieh, 2002; Savolainen, 2011; Kim and Sin, 2011; Lopatovska, 2014). These studies are closely related to the literature in credibility, which is sometimes conceptualized as a set of *criteria, elements* or *features* by which credibility judgements are made (Metzger and Flanagin, 2000; Fogg et al., 2003; Savolainen, 2011; Beheshti et al., 2018). What distinguishes the literature on information quality from credibility is the lack of user

attributes in the construct of information quality: information quality is seen as an objective dimension of information, not necessarily influenced by user perception (Stvilia et al., 2007; Ginsca et al. 2015), whereas credibility is either central or at least inclusive of the user (Fogg and Tseng, 1999; Flanagin & Metzger, 2000; Hilligoss and Rieh, 2008).

Because it includes the user as part of the process, credibility literature also looks at behaviours or actions of the user as another kind of criteria for credibility decision-making (e.g. Flanagin and Metzger, 2007). In LIS *information evaluation* focuses on *how* users evaluated the quality of information in terms of their strategies and actions (Kim et al., 2011; Kim and Sin, 2014). Information evaluation is also part of most Information Literacy frameworks (e.g. ACRL, 2000; Bent and Stubbings, 2011; Mackey and Jacobsen, 2011). Information evaluation has a user-centred focus like credibility but is often characterized by professionally defined best practices, as opposed to actual user behaviour (Kim and Sin, 2014, 2016). Information evaluation is the *ideal* of IB, where the information literate user selects the right information for all the right reasons, a standard toward which behaviour should aim. Despite a focus on this idea approach to user behaviour, IL research has not ignored the role of affect. The inclusion of *attitudes* and *dispositions* in more recent IL frameworks shows a developing interest in affect, albeit from a highly cognitive standpoint (Mackey & Jacobsen, 2011; ACRL, 2015).

All of these concepts – credibility, relevance, quality, evaluation - relate to each other because they also relate to *decisions* or *judgements* about information that involve the user processing information using either objective features or elements of the information itself, or through certain evaluative actions or strategies. Information behaviour models can be understood as laying out a framework for a series of decisions about needing, seeking, finding, and using information, and some of the factors that influence those decisions. Decisions or elements which involve evaluating or processing the quality of information are usually part of these models. For example, Ellis's model of behaviour shows a linear series of decisions or actions, one of which is a decision about the quality of the information (verifying). Kuhlthau's 'selection/exploration' phase of her ISP also implies decisions about information quality (Kuhlthau, 1991). Wilson's Model of Information Behaviour has a box for 'information

processing and selection' grouping both the decision about quality and selection of that information together. Nahl's Sociobiological model provides one of the stronger lenses to view how information quality might be decided, in terms of the overall information selection process, but considering the import of the evaluation decision in the IB process, a stronger lens that considers as many possible factors and relationships is needed. To some extent, evaluation process remains a black box in IB research, as an important but undertheorized part of the IB process. The evaluation stage involves complex cognitive processes that individuals employ to assess the quality of information sources, and complex intervening factors, including an individual's information needs, prior knowledge, beliefs, and emotions. It is difficult to conceptualize what factors are part of the decision-making process about the quality, relevance, or other important criteria of information that makes it useful or needed. We therefore lean on concepts and models from credibility and Psychology literature to create a sharper lens into decisions or judgements about information quality, particularly with respect to the role of emotion.

Credibility literature unites some of the varying terminology around evaluation (relevance, quality) under the overarching definition of credibility (Hilligoss and Rieh, 2008). There are multiple credibility models and frameworks that provide scaffold for investigating factors – such as the role of emotion – in the process of credibility judgement (e.g. Wathen and Burkell, 2002; Hilligoss and Rieh, 2008; Sundar, 2008). By employing a framework for credibility, our study is putting a lens on the evaluation or processing point of the overall IB cycle, which has been done with other key concepts such as information need and use. (Wilson, 1996). In the following subsection, we review the literature on credibility and describe the research and resulting knowledge base on credibility constructs and judgement processes.

2.1.4 Credibility Literature

In the literature, it is generally agreed that credibility is *perceived credibility*, dependent on the ability for the user to *interpret* what they see, but very much influenced by technology, media, and information genre (Fogg and Tseng, 1999; Fogg et al., 2000; Flanagin and Metzger, 2000; Wathen and Burkell, 2002; Rieh and Danielson, 2007; Sundar, 2008; Hilligoss and Rieh, 2008).

The research on credibility puts its focus on the user as opposed to an entirely system-based approach, largely as a result of changes in information technology (Fogg and Tseng, 1999). Credibility is often operationalized by what people *perceive* to be believable, trustworthy, truthful, and in some cases accurate, reliable and relevant.

Credibility researchers have recognized that credibility in online contexts requires a novel understanding of the user's processes of judging credibility as well as the characteristics of new technologies, media and information type, as they have changed drastically from more traditional media-based models (Flanagin and Metzger, 2000). Credibility studies have sought to determine what criteria people use to judge credibility, particularly in relation to new technologies (Fogg et al., 2003; Metzger et al., 2003; Metzger, 2007; Savolainen, 2011; Kim and Sin, 2011; Kim et al., 2011, 2014; Kim and Sin, 2016; Beheshti et al., 2018), and some have attempted to categorize these into socio-technological components that frame the processes of judging credibility (Wathen and Burkell, 2002; Flanagin and Metzger, 2007; Sundar, 2008; Hilligoss and Rieh, 2008). Studies often conclude with suggestions on how to improve user credibility decisions through better design and user education (Fogg and Tseng, 1999; Metzger and Flanagin, 2000; Wathen and Burkell, 2002; Fogg, 2003; Flanagin and Metzger, 2007; Sundar, 2008; Kim and Sin, 2011).

While there has been little attention paid to affect or emotion in the research on credibility, the research that has considered the role of *heuristics* in perceived credibility parlays into a dual model of credibility processing, suggesting a role for more affective processing (Sundar, 2008; Hilligoss and Rieh, 2008; Metzger et al. 2010; Metzger and Flanagin, 2013). In our own study, we use Hilligoss and Rieh's Unifying Framework of Credibility Assessment, which combines various socio-technical elements into a tiered processing approach, including heuristic processing, where a space for affect or emotion may be considered (Hilligoss and Rieh, 2008)

2.1.4.1 The User-Centred Approach and New Technologies

Fogg and Tseng spearhead a new era of credibility research in their examination of computer-based credibility, recognizing that profound changes to technology have de-stabilized traditional constructs of credibility (Fogg and Tseng, 1999). For them, credibility is 'in the eye of

the beholder,' or subjectively constructed: "First, credibility is a perceived quality; it doesn't reside in an object, a person, or a piece of information. Therefore, in discussing the credibility of a computer product, one is always discussing the perception of credibility." (Fogg and Tseng, 1999, p. 80). They further delineate the construct by defining credibility in terms of trustworthiness and expertise and distinguishing between credibility and trust: trust is a judgement by the user of how functionally *dependable* a system is, whereas credibility is the *believability* of information or output from a system. Their analysis results in two approaches to studying credibility: systems perspective, which looks at the physical and technical elements and their perceived credibility, and psychological perspective, which considers perception of softer elements, such as character and brand. This suggests a dual nature of credibility, and presents a problem when investigating the role of technologies, media, and information objects: if credibility is only in the eye of the beholder, how do we conceptualize the role different technologies, platforms, and information objects moderate perception? While subjective experience of credibility is important, so are the technological and media-based systems that support information when judging credibility (Wathen and Burkell, 2002). The argument that technological changes to the information environment are the catalyst for reframing credibility requires that objective aspects of credibility brought on by new technologies must be factored into any conceptual framework. Fogg's report on 'prominence-interpretation' theory (Fogg, 2003) describes the interaction between *design elements* (prominence) and a *user's ability* to evaluate them (interpretation). Following from Fogg's previous work, the theory centralizes the role of the user, who is responsible for both noticing (prominence) and assessing (interpretation). However, the notion of 'prominence' suggests a quality of the object, not the user – features of information sources are often designed to be more easily noticeable, independent of the users' ability to notice. Fogg lists five user-based attributes for the prominence of an element: involvement, topic, task, experience, and individual differences. The 'most dominant' – involvement - suggests that a more involved user will notice more website features. However, his only example of prominence is a large picture, which suggests that the largeness, as opposed user involvement, is the reason for its being noticed. The concept of noticing is also based in a conscious-rational model of cognition, and

does not distinguish between consciously noticing, and subconsciously being aware of something, and how this might impact credibility processing.

Flanagin and Metzger (2000) continue the discourse on credibility as perceived by the user, while shifting focus to the role of different media and information type on perceived credibility. Using the results from a survey of 1041 undergraduate students, they show the impact of media, information type, and user experience with the internet on verification behaviours and resulting credibility perceptions. Their study compares user perception of credibility of internet information with more traditional media (magazines, newspaper, radio, TV) as well as different information types (news, reference, commercial, entertainment). They considered user experience with the internet as a possible factor of credibility perception, although they did not consider user experience with the other media, perhaps assuming that users will have similar exposure to these more traditional media. Overall, they did not find much difference in perceived credibility across media, with the exception of newspapers. They also found that, while internet experience meant users were more likely to find internet information credible, they did not necessarily find it more credible than other media. A subsequent study (Metzger et al., 2003) used data from 436 undergraduates and 307 nonstudents to compare how credible the information they found across various media (Internet, books, journals, newspapers, magazines) and information type (news, reference, entertainment, commercial). They found that students generally found all media to be more credible across all information types compared to the nonstudent group, with the exception of the Internet, which they found to be about the same level of credibility. They had a few explanations for these differences, primarily to do with experience and age, but no conclusive finding about why these two populations would disagree about other media but agree about the Internet.

What most earlier researchers of credibility in new technologies agree on is that information on the Internet requires a new understanding about credibility judgement, and that comparison with other media may not be enough to see how web-based technologies are changing ideas about credibility. Research seeking these answers continue to look at large samples, trying to collect lists of criteria and behaviours that describe how users are judging credibility in these new environments.

2.1.4.2 Credibility and Internet-based Technologies

These studies of credibility in new web-based technologies, examine more closely those technological factors through large-scale survey-based studies of user strategies and behaviours in various contexts and among different populations (Fogg et al., 2003; Savolainen, 2011; Kim and Sin, 2011; Kim et al., 2014; Kim and Sin 2016) Studies have generated lists of criteria for judging credibility, that both broaden and contextualize credibility concepts. Criteria are sometimes delineated by categories from previous literature on information quality, fleshing out those categories out by providing actual qualities used to judge credibility in real information contexts (e.g. Savolainen, 2011). Others take a more grounded approach, collecting open responses from participants on what they think makes a 'credible' source on the World Wide Web (e.g. Fogg et al., Kim et al., 2011). Studies tend to use large datasets, helping to establish some generalized but detailed definitions for new credibility concepts.

Fogg et al. uses data from 2684 responses to a survey asking participants to both rank various websites for credibility as well as leave open comments on what they found to be credible about the sites. This study yielded a list of 18 criteria: the top 3 included Design Look, Information Design/Structure, and Information Focus. The prominence of *design* is a recurring theme in the credibility literature, indicating the importance of surface characteristics in new online environments. Fogg et al. suggest as much with their first of six recommendations to website creators being about investing in design: "No matter how good a site's content, the visual aspects of a Web site will have a significant impact on how people assess credibility. To create a highly credible Web site, one should invest in the design look of the site" (Fogg et al., 2003, p. 13). The equation of design and credibility is problematic, particularly from an IL standpoint, which asks for more critical look at information – the tension between credibility and the *look* of credibility is one that is highly suggestive of a role for emotion.

Savolainen uses a content analysis of 4,739 messages from a Finnish online forum to develop two lists of 13 user-generated criteria each for *quality* and *credibility* judgements about information (Savolainen, 2011). His analysis was primarily based on distinguishing between quality and credibility; acknowledging that these concepts are sometimes used interchangeably in LIS but treated differently in other literature. He defines information quality as aspects of

the message, such as accuracy and usefulness, while credibility is defined as aspects of the source, such as trustworthiness and expertise. He further analysed whether these criteria tended to be framed in positive or negative terms. He found that credibility was more often judged using negatively framed criteria but notes that the results were limited by the structure and topic of the forum, which was controversial in nature and involved discussion of arguments for and against immigration. Interestingly, Savolainen found that author credentials were most important for credibility, showing that while the same general components emerge throughout the research on credibility, their importance vary by population and contexts.

An issue with much of the research comparing new technologies and traditional ones with respect to selection criteria is that the criteria is often drawn from previous research or drawn traditional concepts of credibility from traditional media, such as print or academic library-based information structures. A more grounded approach to selection criteria on the Internet, particularly with respect to social media, may be required; the issue may not be a gap between knowledge and behaviour, but that new knowledge is being developed in new technological contexts. Kim et al. look at the role of social media and its influence on how academic populations judge credibility (Kim et al., 2011; Kim et al., 2014), creating lists of selection criteria for these new web-based media sources. Their survey study of 446 undergraduates looks at the type of social media used for information and the actions taken to evaluate the *trustworthiness* of information for academic and everyday life. They find that social media sources are becoming more important to undergraduates as sources of information and that students are trying to evaluate the trustworthiness, despite the difficulties with socially constructed information and the limits of traditional ways of evaluating. They recommend that information literacy programming should be considering these changes. They extended this work in a later study of 833 undergraduates used a similar method to collect data on 7 social media platforms use and evaluative actions, which generated a list of top 5 actions ranked under each social media platform (Kim et al., 2014). They further analyzed these actions under categories or information facets, and whether the actions were internal or external to the information source. They found that, when looking at actions from these perspective, some

actions are comparable to traditional means, demonstrating that students may be employing some of their traditional knowledge in these new information contexts.

Studies also examine growing gaps between knowledge about credibility and actual credibility behaviour by comparing different populations (e.g. students vs faculty) or reported knowledge and reported behaviour. Researchers Kim and Sin look at academic populations (undergraduates, graduates, faculty), and their use of Internet and social media use in various information types, comparing their skills with their knowledge (Kim and Sin, 2011; Kim and Sin, 2016). Their 2011 study of 576 undergraduates compared their use of mostly online media (Web search engines, websites, online database, online journals and books (print)) and found that, while they ranked various selection criteria as important, these same criteria were not considered to be characteristics of regularly used sources when rated by the same population, showing a gap between their knowledge about selection criteria and their behaviour (Kim and Sin, 2011).

A continuation of previous work on social media use and evaluation described above, Kim and Sin's study comparing the survey responses of 1355 undergraduates and 189 information professionals revealed that, while students and librarians used similar social media platforms for similar purposes, *how* they evaluated the information found there was different. They found that students used more social means of evaluating, as well as relied on physical cues, such as length and number of pictures. They note that these may equate to more heuristic means of evaluating and suggest that professionals address this tendency in information literacy programming. However, they also note that heuristic processing is a response to the ever growing and changing information landscape faced on the web, and the need to processes information quickly and efficiently. When comparing students and librarians' results, they take the professional's approach as the *de facto* baseline standard when comparing, which is reasonable, but also may not consider that this baseline is rooted in traditional media, where information overload and time pressure may be less of a factor, and that the student's heuristic processing may be a strategy that must be approached critically from both sides. The gap in undergraduate knowledge, points to both a need for better education programming, as well as

a deeper understanding of the evolving needs and behaviours of younger populations (Kim and Sin, 2016).

Beheshti et al.'s survey-based study comparing Canadian and International undergraduate student IB found that both groups used similar criteria as Kim and Sin's study, with the addition of Google search results, where being in the top 5 results was a criteria of credibility (Beheshti et al, 2018). This suggests that, as studies of credibility on the Internet progress, more criteria relating to particularities of web-based and social media technologies are likely to emerge, which will have to be processed and integrated into the work of information literacy along the way.

2.1.4.3 Components of Credibility - Models and Frameworks

When taking into account the influence of technologies on the user's perception, the line between user and technology is not always clear, making a more in-depth analysis of emotion as an attribute of the user in an arrangement of socio-technological factors difficult. A stable framework clearly delineating the role and attributes of both user and technological components is required to make observations about how emotion may be influencing credibility judgements. Various models exist in the literature, providing lenses for how different components that factor in credibility judgement interact with each other, and how they compose a process of credibility judgement via these interactions (Wathen and Burkell, 2002; Metzger and Flanagin, 2007; Sundar, 2008; Hilligoss and Rieh, 2008). Models account for socio-technical elements (user, media, content, source, technology) and processes by which credibility is judged (interactions with cues, heuristics).

The development of frameworks that bring together users and technological components of credibility circumvents the need to position credibility as either objective or subjective by bringing them into interactive configurations. Wathen and Burkell's analysis of credibility literature results in a 'proposed model,' a stage-based framework that maps out how a user might check credibility, from surface features like colour or font choice to actual content, with the user evaluating credibility at each stage; they noted that surface and message stages may be sequential or simultaneous (Wathen and Burkell, 2002). According to Wathen and Burkell's

model, the structural elements of information dictate how credibility is processed based on the prominence of surface cues, which are easier to see (e.g. design elements), to source cues (e.g. authorship or affiliation of a website), and finally to content (the knowledge contained within the text, video, audio of the source). At any of the three stages, the user may decide that the information is not credible. Whether this occurs depends on factors at each step, including those relating to the user themselves, such as their level of knowledge about a topic, or their level of need for information. Wathen and Burkell include some affective components in the 3 stages of processing (content) where users ('receiver') are meant to interrogate their own motivation and level of stress or interest.

Metzger and Flanagin use a large sample technique (survey of 574 undergraduates) in order to establish statistically sound evidence comparing the relative importance of 3 components of credibility in web-based information: sponsor, message, and site (Flanagin and Metzger, 2007). There are similarities with Wathen and Burkell's (2002) stage-based model (surface, source/message, content), although they do not reference Wathen and Burkell in their study. Flanagin and Metzger found that sponsor familiarity was as influential as site attributes, suggesting that source-related cues are not more important than design- and content-related cues when users are looking at web information; the implication is that in a context where information can be published by anyone, source cues such as familiarity and affiliation and site cues such as website design carry the same weight as message content. Different strategies for judging credibility, therefore, may apply to different information contexts. Additionally, they found an important role for audience disposition and experience in the willingness to find information online credible. Although not framed as 'affective,' by Flanagin and Metzger, they list dispositions such as skepticism and attitudes, which are on the affective spectrum (Scherer, 2005).

Sundar's MAIN model addresses both user and technology, with emphasis on the role of technology and its affordances (Sundar, 2008). In Sundar's model, affordances produce various 'cues,' which have been categorized into 4 groups: Modality; Agency; Interactivity and Navigability (MAIN). Cues can activate *heuristics* in the user, a type of cognitive processing that is based on generalized rules rather than purely systematic analysis. Heuristics help to process

the cues into qualities, which contribute to an overall credibility judgement. This framework brings into configuration technologies and users through a series of process-based relationships, that together produce an overall judgement of credibility. The onus of deciding on credibility is not entirely on the user but begins in the *affordances* of technologies. The user's agency lies in their choice of heuristic by which to make quality judgements. However, according to Sundar's model, users process *all* cues using heuristics. Sundar sees the conscious use of heuristics (as opposed to automatic or unconscious use) as part of a systematic processing. However, there does not seem to be a place for systematic processing or learning through direct interaction with cues as information without first processing through heuristics.

Hilligoss and Rieh's Unifying Framework of Credibility Assessment, which is used in our study, also features heuristics that closely resemble Sundar's (Hilligoss and Rieh, 2008). They use empirical evidence to develop their framework, although they also draw on theory from the prevailing literature in credibility. As the name suggests, the intention of this framework was to integrate what they saw as a proliferation of models and concepts of credibility that were irreconcilable, due to disciplinary differences in approach. They used data from a study of 24 undergraduate students' diaries of their information activities over 10 days. The ensuing hierarchical framework consists of 3 levels of abstraction at which a user processes and defines credibility of information objects. The 3-level model allows for a nuanced understanding of how credibility is both constructed and processed, including how new concepts can be learned, overridden, and entrenched. The model is user-centred, focused on the interactions, heuristic rules, and constructs of credibility; information is tangential to the core of the model, what is interacted with. The levels of abstraction address some of the tension between subjective experience of information and objective criteria and constructs, by providing an explanation for the process of developing rules and constructs out of the more subjective interaction process. The framework also includes 'context' as an important factor in how users interact with and process credibility. This will be explained in more detail in our 'Theoretical Framework' section (2.2). Although Hilligoss and Rieh developed this framework based on empirical data, their use of 'cues' at the Interaction level resembles closely the idea of 'affordances' from the MAIN

model, which they refer to in their work (Sundar, 2008). Their choice of the term 'heuristics' is also shared with the MAIN model.

These models and frameworks create a stable conceptual space to look more closely at attributes and characteristics of various components. To understand how emotion influences credibility, we need to explore the role of emotion as an attribute of the user's experience of credibility. For this reason, we chose to structure our interviews based on a framework that focuses on the user: Hilligoss and Rieh's Unifying Framework of Credibility Assessment centres on the user while the user processes credibility through interaction with information objects in context (Hilligoss and Rieh, 2008). Because emotion in credibility is not yet included as an important component in credibility frameworks, we have chosen to use concepts from decision-making theory in Psychology, and to treat credibility as a decision about information.

2.1.5 Credibility and Affect

There are very few explicit references to affective factors in the research on credibility but similarly to LIS research, the complexity of new technologies and the importance of user attributes have laid the groundwork for some inclusion of affect in research. Fogg & Tseng inspire a user-centred approach to credibility as perceived by the user. Fogg goes on to develop user attributes such as 'involvement' (also referred to as motivation) and 'individual style' and while he does not explicit mention affect or emotion, it is not difficult to make the argument that affective attributes not only belong in a user-centred approach but enrich this approach by providing a richer lens for cognitive processes.

Wathen and Burkell positions the user in a more elaborate framework with technologies and message content but goes beyond a rational-cognitive user to include reflection of 'motivation' and 'level of stress' as part of the evaluative process in their credibility model (Wathen and Burkell, 2002). Flanagin and Metzger include 'audience disposition' as a third factor in their study of source, sponsor, and message influence on credibility perceptions (Flanagin and Metzger, 2007). Hilligoss and Rieh's Unifying Model explicitly mentions user emotions as part of their framework, albeit somewhat marginally as one factor in a subcategory of their framework (Hilligoss and Rieh, 2008). Perhaps as a natural progression of some of this work,

Metzger and Flanagin later address 'Psychological Approaches' to credibility and describe multiple user attributes as factors in credibility perception; they agree that, if credibility is a user perception, a detailed understanding of various attributes is needed to understand differences in how users perceive credibility. While there is no in-depth look at the role of emotion, they include personality type and propensity to trust one's intuition, faith, or feeling as factors (Metzger and Flanagin, 2015).

As we noted in the LIS literature, affect may be gaining relevance in credibility research due to the more recent expansion into social media and more complex Internet environments (Kim et al., 2014; Metzger and Flanagin, 2015; Kim et al., 2016). Credibility research has begun to move toward social-constructive and non-linear processing, partly due to the complexity of online information environments (Metzger et al, 2010; Savolainen, 2011; Metzger and Flanagin, 2013; Kim and Sin, 2016; Alrubaian et al., 2018). We noted above that Kim et al. found undergraduate students were developing social means of evaluating the information they found on social media (Kim et al., 2011, 2014). Metzger et al.'s (2010) focus group study looks at the behaviour of 109 users with a socially constructed credibility approach, in a way that recalls Fisher and Naumer's Information Grounds (Fisher and Naumer, 2006). Their study looked at how credibility is judged on the internet and found that their participants used social methods of judging credibility, such as pooling information and resource sharing.

Another place where affect may be explored in Credibility is in the concept of *cues* and *heuristics*, which we described above as part of Sundar's MAIN model as well as featured in Hilligoss and Rieh's Unifying Framework of Credibility Assessment (Sundar, 2008; Hilligoss and Rieh, 2008). Both Hilligoss and Rieh and Sundar make brief mention of affective elements in their descriptions of cues. Heuristics also relate to theories of dual processing of information, where more systematic processing is considered rational while heuristic processing can be influenced by affect (e.g. Finucane, 2008). Metzger et al.'s focus-group based study mentioned above also found that credibility processing is largely heuristic rather than rational, supporting Sundar's research (Metzger et al., 2010). They found that heuristics were often used for quicker judgements, that were sometimes based on social constructs, such as

endorsement and reputation, although not all heuristics were socially constructed, such as consistency and expectancy violation. Kim et al. also notes that students were developing heuristics to deal with information overload and time constraints (Kim and Sin, 2016).

Metzger et al. 2020 examine the role of 'cognitive dissonance' as a factor in selective exposure in their experimental study of 2146 adults living in the US. They felt that existing measures of cognitive dissonance had focused on only the affective dimension (arousal) and only on attitude-challenging information. They used an online method which exposed participants to news information varying in political attitudes, from right-wing, balanced or centred, to left wing in order to measure cognitive dissonance, credibility perceptions, and likelihood of selective exposure. Their operationalization of 'cognitive dissonance' included both a cognitive and affective dimension: Likert scale questions asked participants to rank statements that included affective or emotional terms, including 'regret,' 'uncomfortable', 'like,' and 'enjoy' framed in cognitive statements about one's own views and stances. Predictably, they found that participants experienced less cognitive dissonance reading sources and stories that were attitude-consistent and planned to return to those sources (selective exposure). However, while participants experienced cognitive dissonance for both attitude challenging and balanced sources and stories, they were more likely to return to balanced sources, despite their cognitive dissonance, showing that cognitive dissonance did not always predict selective exposure. This finding emphasizes the importance of including an affective dimension along with a cognitive one; although they didn't find that cognitive dissonance predicted selective exposure to balanced sources, they may have demonstrated an important interaction between cognitive and affective processes, for example, that the cognitive processes were able to 'override' their affective feelings of dissonance because of their consideration of balance as an important criteria of credibility. Furthermore, while dissonance may not predict selective exposure to balanced sources, it may have played a role in the selective exposure regarding attitude-challenging sources that is worth exploring further.

Emotion as a focus of credibility research has gained some recent interest, however mostly with respect to *embedded* emotion, emotional language and expression contained within messages

content. (Ren and Hong, 2018; Guo et al., 2020; Chung and Zeng, 2020). This research often uses text analysis of various platforms to search for indications of emotions within the text in order to extrapolate the influence of these emotions on subsequent decisions, such as decisions to purchase or use information, indicators of credibility decisions. Ren and Hong analysed 75,924 'verified purchase' reviews on Amazon.com to look at the relationship between discrete emotions – sadness, fear, and anger – on helpfulness of review indicators. They found that anger and sadness had a negative effect on perceived helpfulness, while fear had a positive effect. This kind of study has statistical power, and can draw strong relationships between emotion and decision-making, but cannot comment on the individual's motivation for these decisions, or the other contextual factors that may be at play.

We have seen in the research on credibility that credibility is *perceived* while also resulting from complex relationships among the user and the various components of information technology. If the user's *perception* accounts for a variation in credibility judgements, affect is likely to play a prominent role in credibility. We have also seen a trend toward more in-depth examination of the user's knowledge, behaviours and strategies in the face of changing information technologies. As an important attribute of the user, and influencer of behaviours as well as cognitive processes, it would seem reasonable to examine the role of affect in credibility judgements.

2.1.6 Trust, Trustworthiness, and Technology

Most credibility definitions consider trustworthiness to be a key construct of credibility (e.g. Fogg and Tseng, 1999; Wathen and Burkell, 2002; Hilligoss and Rieh, 2008; Ginsca et al., 2015); However, the research is somewhat unclear on how *trust* relates to credibility, despite its obvious connection to trustworthiness. Trust and trustworthiness are important concepts in many other disciplines, including Management and Commerce, and so we draw on some of this literature in this section to help to enrich the discussion of credibility and trust. It should be said that the research on trust is prolific, and we only touch on some conceptual issues that help us to better understand our primary topics – credibility, emotion, and information technology.

One overlap in the literature on trust and that of credibility is in the use of attributes or factors of trustworthiness. Trust researchers have found several factors or antecedents of trust – or those things which the trustor looks for in a trustee – many of which resemble the criteria and constructs of credibility (Mayer et al., 1995). Mayer et al.'s analysis of several studies brought out three key factors: benevolence, integrity and ability. These factors are independent, but related, and necessary for any kind of meaningful trust. In the real world, the trustor would like to be 100% sure of each of these factors, but in reality, the subjectivity of trust means that the trustor can perceive what is limited to his or her experience (Cho et al., 2015). Different contexts may also dictate which factor is more important, for example, you may be able to trust your doctor to cure your ailments based on the degrees posted on her wall (ability), even if you only have limited knowledge of her good will and integrity.

In his study on knowledge sharing in organizations, Evans (2013) found that perceived trustworthiness (from Mayer et al.'s benevolence, integrity, ability) was the most important factor influencing three knowledge sharing dimensions: willingness to share, willingness to use, and perceived receipt of useful knowledge. Knowledge sharing dimensions are tangentially related to credibility, in that usefulness of information can be tied to a belief in its credibility. Evans et al. (2018) later found that, as the most important factor, perceived trustworthiness mediated the other factors of knowledge sharing.

In earlier credibility literature, trust is not well defined as a construct in credibility; research has focused more on the meaning of trust as opposed to its function or role in the credibility process. Fogg and Tseng (1999) bring up a semantic issue with equating trust and credibility, which they propose to solve by equating trust with *dependability* (of a person, object or system) and credibility with *believability* (of information). However, equating trust with dependability does not solve the semantic issue. The relationship between trust and dependability is the same between trust and credibility, that is, a dichotomy between the subjective and objective aspects of the concept: trust is an action performed by the trustor (subject), while dependability is a quality of the trustee (object); neither credibility nor dependability can be equated or used to explain trust. The authors could have used 'depend on' in their argument, which may have lead them to draw a different conclusion, since

'depending on' still implicates the agency and subjectivity of the person, and not the qualities of the object. The difference may seem pedantic but distinguishing between the subjective or objective aspects of trust or credibility is important, particularly with respect to the role of emotion in credibility decisions, which is an attribute of the subject, not the object.

Some of the conflation between the subjective and objective aspects of trust may have to do with a debate as to whether trust can exist between humans and technologies; trust traditionally refers to 'interpersonal trust' where both trustor and trustee are human and have agency, and therefore constructs such as good will and integrity are considered important qualities of the trustee (Mayer et al., 1995; Friedman et al., 2000). Friedman et al.'s concept piece on trust concludes that "people trust people, not technologies" because technologies do not have the agency and good will required in a trusting relationship. However, the definition of trust has had to be extended to include new information contexts where the line between human and technology is becoming more and more blurred (Rieh and Danielson, 2007; Cho et al., 2015). In their survey of trust literature, Cho et al. address the problem of modeling trust in complex socio-technical networks through their concept of 'composite trust,' which integrates multiple types of trust, each with their own particular set of characteristics: communication trust (quality of transmission), information trust (credibility), social trust (source reliability); and cognitive trust (processing ability) (Cho et al., 2015). The model acknowledges that factors operating in any of these categories can ultimately influence trust in those networks. Despite the complexity of their model, the agency belongs to the trustor, who makes the ultimate decision about the trustworthiness of the trustee. They state that trust is 'inherently subjective,' based in uncertainty and incomplete knowledge and that in reality, there is no 'objective trust.'

Even if we accept the view that the trustee needs to have human qualities like agency and good will, our information technologies are becoming increasingly imbued with human qualities. Sung and Kim's study on brand personality finds that brand trust and brand affect are influenced by the personality-like dimensions of brands (Sung and Kim, 2010). Brand personality is the concept that, while brands do not have human agency, consumers perceive and relate to the characteristics and functions of brands as though they do. In their study,

brand personality is measured using a five-dimensional model not unlike the Big 5 personality measures used with humans; it consists of Sincerity, Excitement, Competence, Sophistication and Ruggedness. The authors hypothesize that Excitement, Sophistication and Ruggedness would influence brand *affect* – or what emotion the brand elicits – and Sincerity and Competence would influence brand *trust* – the perception of the brand's trustworthiness and expertise. However, they do not find much evidence that this was the case, with cognitive personality traits influencing both trust and affect. This may be explained by presuming a dichotomy between trust and affect, when trust has already been conceptualized as having affective characteristics (Cho et al., 2015).

In all of the above models, trust is a verb or action that refers to the *trustor*, and trustworthiness is a quality of the *trustee*, be they human or technology (Ginsca et al., 2015). However, as we saw above, the Credibility literature does not clearly delineate trust and trustworthiness in terms of *user* and *object* but tends to use them interchangeably. A more semantically sound comparison between trust and *confidence* has been made in the literature. Confidence is an attitude of the trustor, rather than a quality of the trustee (Mayer et al., 1995; Ginsca et al., 2015). Mayer et al. note that the comparison between trust and confidence is 'amorphous,' using Luhmann's view that an assumption of risk differentiates trust from confidence (Luhmann, 1988 in Mayer et al., 1995). Research in Psychology has been examining the role of emotion in decision-making about risk for decades (Johnson and Tversky, 1983; Finucane et al., 2000; Lerner et al., 2015; Parrott, 2017), These overlaps in trust, credibility, and decision-making theory help to elucidate where emotion can factor into credibility decision-making. We look more closely at Psychology research on the role of emotion in decision-making in our Theoretical Framework section.

Table 1: Summary of LIS Research, including overarching definitions and operationalizations for affect and emotion.

Library and Information Studies and Affect/Emotion				
	Definitions of Affect/Emotion	**Operationalizations of Affect/Emotion**	**References**	**Concepts/Frameworks**
Early Adopters	Affect is broadly, vaguely defined as separate but important domain than rational cognition. Affective elements interact with other domains to motivate or demotivate seeking and searching in terms of needs or goals	Self-reports and observations of stress, self-efficacy, uncertainty, frustration, satisfaction, confidence and motivation during information behaviour	Dervin 1983, 1992 Mellon 1986 Kuhlthau 1991 Nahl and Tenopir 1996 Nahl 1998 Wilson 1999	Sense-making; User-centred approach Library Anxiety Information Search Process (ISP) Affective, cognitive, sensorimotor domains User-centred approach Stress/Coping
Internet-based technologies	Affect is defined as affective characteristics/attributes of the user that can influence IB performance while adapting to complex online contexts.	Self-reporting of affective characteristics including self-efficacy, uncertainty optimism, frustration, time pressure, expected difficulty	Nahl 2004 Nahl 2005 Savolainen 2007 Kim 2008	Feeling-goals Affective load theory; affective coping skills Information overload Affective coping skills
ELIS and Social Contexts	Affect is part of the social world of IB. Information has dual purpose – informational and affective (care/comfort). Affect can limit interactions due to social norms.	Self-reporting or observation in context of emotions including feeling supported/cared for, pain, shame, and fear of judgement	Fisher and Landry 2007 Sin and Kim 2013 Lingel and boyd 2013 Landry 2014 Loudon et al. 2016 Ruthven et al. 2018	Information grounds Big 5 Personality Inventory Human information behaviour; information poverty Theory of Normative Behavior; information grounds Information grounds Information poverty

Embodiment and pleasure	Affect is valence-based feeling (negative or positive) and is an integral part or the user experience (e.g. embodied IB) or of the information context (e.g. social networks). Includes feelings as goals in themselves in IB or as influencing the IB process through context.	Self-reporting or observation in context of emotions including satisfaction, pleasure, interest	Fulton 2009 Laplante and Downie 2011 Keilty 2012 Solhjoo, 2022	Pleasure principal in information seeking Utilitarian and hedonistic search outcomes Embodied information seeking; Theory of desire; Theory of cathexis Embodied information, animal communication
Health information	Affect is both part of the information context AND motivates or demotivates seeking, searching processes, and in particular *sharing* information as part of a network.	Self-reporting using surveys and interviews of emotions and self-efficacy around health information; observation of emotional cues, language in social information networks as information contexts	Lee et al. 2008 Veinot 2009 Anderson and Agrawal 2011 Godbold 2013 Chasiotis et al. 2019 Huttunen, 2023	Action tendency; Stress/coping; health self-efficacy Network-mediated Information processes; Collaborative information behavior framework Communication privacy management; Risk-as-feeling Sense-making; implicit emotion Health information seeking self-efficacy; problem coping Triangulation, cognitive authority, embodiment
IB and Psychology	Emotion is specific type of affect. Emotion is multifaceted and can be detected through feeling as well as other socio-biological	Various methods are used to measure emotion as part of information behaviour including eye tracking, facial expressions, biometrics and self-	Arapakis et al. 2008 Gwizdka and Lopatovska 2009	Emotion and relevance feedback Subjective vs behavioural factors in ISP

	phenomenon. Emotion definitions and theory draw from decision-making theory from Psychology	reporting, particularly in-situ reporting methods (e.g. thinking aloud)	Moshfeghi and Jose 2013 Lopatovska 2014 Zanganeh and Hariri 2018	Affective and physiological signals and relevance feedback Primary emotions, secondary emotions, mood and ISP Emotional expression and information retrieval

Table 2: Summary of Credibility Research, including overarching definitions and operationalizations for Credibility

Credibility				
Theme	**Definitions of Credibility**	**Operationalizations of credibility**	**References**	**Concepts and Frameworks**
The User-Centred Approach & New Technologies	Credibility is 'perceived credibility' and defined as the user's perception of believability, trustworthiness, accuracy, completeness and truthfulness. Profound changes to technologies have destabilized credibility	Self-reporting or observation of user perceptions and strategies for judging trustworthiness and truthfulness of information on the web vs traditional media	Fogg et al. 2000 Flanagin and Metzger 2000 Fogg 2000 Metzger et al. 2003	Website elements Experience of media Prominence and interpretation theory Information Quality and Authority Internet literacy

Credibility and the Web	Perceiving credibility for online information is different from other media, there are new criteria and strategies involved in determining credibility of this information. There is a gap in knowledge about traditional media credibility and Internet/Web-based media credibility.	Observations and self-reporting are based on dimensions of credibility such as believability, trustworthiness, accuracy, completeness and truthfulness. Criteria and strategies may be user-generated or drawn from the extant literature on information quality, relevance, and literacies.	Fogg et al. 2003 Savolainen 2011 Kim and Sin 2011 Kim et al. 2011 2014 Kim and Sin 2016 Beheshti et al. 2018	User-generated credibility criteria User-generated relevance criteria Source characteristics – multiple media Information evaluation actions– social media Information evaluation actions – social media students vs librarians Meta-literacy
Components of Credibility	Credibility is mediated through socio-technological components with influence on how credibility is perceived. Components can include message or content, source, and user characteristics. Components represent stages of credibility processing	Self-reporting or observation rating importance or use of criteria that are organized under and measure the different components of credibility	Wathen and Burkell 2002 Rieh 2002 Flanagin and Metzger 2007 Sundar 2008 Hilligoss and Rieh 2008	Surface and content credibility Information quality and authority Message, site, sponsor credibility MAIN model Unifying Framework of Credibility
Credibility Cues and Heuristics	Credibility judgements are the result of a particular kind of credibility processing between the user's perception and objective components of the information source.	Self-reported or observed strategies for processing credibility in complex information contexts (social media, web-based).	Sundar 2008 Hilligoss and Rieh 2008 Metzger et al. 2010 Metzger and Flanagin 2013 Metzger et al. 2020	MAIN model; heuristics Unifying Framework of Credibility Social credibility processing Heuristics Bias and Confirmation Bias Cognitive dissonance

Credibility and Trust	While closely related through the concept of 'trustworthiness,' there are important semantic and conceptual distinctions between trust and credibility that help to better distinguish credibility and where emotion may be a factor	Conceptual research that defines trust in relation to similar concepts (confidence, trustworthiness, dependability) Models showing interaction of trustor and trustee, antecedents and factors of trust	Mayer et al. 1995 Fogg and Tseng 1999 Friedman et al. 2000 Sung and Kim 2010 Evans 2013 Ginsca et al. 2015 Cho et al. 2015	Trustor/trustee; integrity, benevolence, ability Trust = dependability Interpersonal trust Brand trust, affect, personality Trust & knowledge sharing Trust & confidence; trustor/trustee Composite trust

Our account of IB literature has shown some parallel exploration of new technologies and social information practices that have led to more interest in affect as a factor in IB and decision-making around information, including a growth in research employing concepts and methods from Psychology. Because we understand credibility judgements to be a kind of decision-making about information quality, and because research in Psychology has given evidence of a key role for emotion in decision-making (Damasio, 1998; Lerner and Keltner, 2000; Lerner et al., 2015), we are using concepts and theory from the research on emotion and decision-making from Psychology in order to explore the role if emotion in credibility and credibility judgements.

2.2 Theoretical Framework

This section will present the definitions and their operationalization for *emotion* and *credibility* as well as important theoretical concepts from Psychology that help with the data collection and analysis. We describe Hilligoss and Rieh's Unifying Framework of Credibility Assessment in detail and illustrate where and how we may be able to extend this model of credibility to include a role for affect or emotion (Hilligoss and Rieh, 2008); extending this framework to include emotion is one of our research objectives. Because emotion is undertheorized in the

credibility literature, we are drawing from literature in Psychology, which has been examining the role of emotion in decision-making extensively (Schwartz and Clore, 1988; Frijda et al, 1989; Damasio, 1995; Lerner and Keltner, 2000; Schwartz, 2012, Lerner et al, 2015). Credibility judgements are a key decision in IB; they engender the decision to believe, use, and share information. Therefore, we employed some key concepts from Psychology regarding emotion in decision-making, including 'feeling-as-information' (Schwartz, 2012) and the concepts of 'incidental' and 'integral' emotion (Schwartz, 2012; Lerner et al., 2015).

2.2.1 Credibility

2.2.1.1 Definition and Operationalization

In the literature, credibility is defined using synonymous terms such as 'trustworthiness,' 'truthfulness' or 'believability,' and in some cases 'objectivity,' 'completeness,' 'reliability,' or 'accuracy.' (Fogg and Tseng, 1999; Wathen and Burkell, 2002; Hilligoss and Rieh, 2008). These same terms are often used to operationalize credibility in studies, where participants are asked about whether information from certain sources is trustworthy, truthful etc., (e.g. Flanagin and Metzger, 2000) and what actions they may take to verify information from certain sources (e.g. Kim et al., 2011, 2014). Our definition of credibility comes Hilligoss and Rieh's Unifying Framework of Credibility Assessment, which has a 'construct' component of credibility, as found in their empirical research of 24 undergraduate students. For them, the 'construct of credibility' is "how a person conceptualizes and defines credibility, providing a particular point of view for judging credibility in fundamental ways." (Hilligoss and Rieh, 2008, p. 1474). In the framework, *Construct* includes the terms truthfulness, believability, trustworthiness, objectivity and reliability, but they are not considered to be interchangeable with each other; the different constructs guide credibility judgments depending on other factors. Users choose or are directed by whichever construct suits their particular need or context, and subsequently, their processes and actions when making credibility decisions or assessments. Flexibility about the application of constructs, without treating them as synonymous allows for more nuanced approach to credibility in multiple information contexts: as our study was looking across several

information topics (news, health, leisure and academic information), we felt that this flexibility was suitable. More details about the framework are describe in the subsection below.

How credibility is measured adds another layer of complexity. Credibility models present credibility as a product of multifaceted interactions involving objective and subjective components, including source attributes, media attributes, technological affordances, and user behaviours (Wathen and Burkell, 2002; Rieh and Danielson, 2007; Sundar, 2008, Hilligoss and Rieh, 2008). These components of credibility are fleshed out by lists of criteria –particular qualities of information or actions taken by users to verify information – that vary by technology or context. We follow the same grounded approach to defining credibility criteria as the literature in web-based credibility, which presumes that new, online contexts will engender new criteria for judging credibility (Fogg et al., 2003; Savolainen, 2011, Kim et al., 2011, 2014). Our study examines the role of a new factor – emotion - in credibility judgments online across multiple information topics, so we felt this was the best approach.

Credibility is operationalized based on our participant's interpretation of the term credibility, including the same vocabulary used in Hilligoss and Rieh's framework to describe the construct of credibility as an overall definition (truthfulness, believability, trustworthiness, objectivity and reliability). Credibility was also operationalized by the criteria, those objective qualities and features of information and information sources referred to by users as well as the strategies or actions taken to judge credibility. The interview guide also uses criteria based on a survey question from another study[3] that we participated in, phrased as 'factors' based on the exact language of the question:

> Question 3: "In general, when you judge the credibility of information on the Internet, how much do you consider the following factors[4]?" Responses were chosen from a list of the following 9 items:
>
> 1. Website is in the top 5 hits on Google search results

[3] See https://www.mcgill.ca/informationseeking/.
[4] While the term 'factors' is used in the survey, our study uses the term 'criteria' to signify these items.

2. Other users' reaction to a posting (e.g. ratings, comments)
3. Quality of images, sounds, videos
4. Quality of language
5. Information is up to date
6. Information matches other sources
7. Experience, Affiliation, Reputation of author
8. My previous experience with a website or source
9. My good or bad feeling about a website or source

The first eight items were developed from the results of four focus groups and a literature analysis on IB and credibility (Beheshti et al., 2018). The remaining item - "My good or bad feeling about the source" - was designed to operationalize emotion and developed based on appraisal dimension models from the literature: the valence dimension (negative and positive) is common to all well-established appraisal dimension models of emotion (Smith and Ellsworth, 1985; Roseman et al., 1990; Learner and Keltner, 2000; Chartrand, 2005; Barrett, 2006; Lerner et al., 2015), and was considered a reasonable proxy for emotion in general, in light of the limitations of the survey. We incorporated this question into our interview tool originally as a means to explore findings from the survey. Although we did not end up using the survey data in this study, we felt that the question provided important data about some of the more common criteria of credibility and therefore used it in our analysis.

2.2.1.2 Description of Hilligoss and Rieh's Unifying Framework of Credibility Assessment

Hilligoss and Rieh proposed the Unifying Framework of Credibility Assessment (Figure 1) in response to what the authors saw as incompatibility among approaches to credibility that came out of research in specific fields, including studies of different information contexts and populations (Hilligoss and Rieh, 2008). They state that credibility research performed in one context did not necessarily transfer to other contexts, and thus a 'unifying framework' was needed to bring together aspects of credibility that were shared across contexts. We found in our own literature review a duality between user-based perspectives of credibility (strategies and actions), and objective qualities of information, which was addressed within Hilligoss and

Rieh's framework by focusing on the user's process of credibility judgement, while acknowledging the influential role of 'context' and 'information' as important but not central to the credibility judgement process. The framework divides credibility judgement into three levels: Interaction, Heuristics, and Construct.

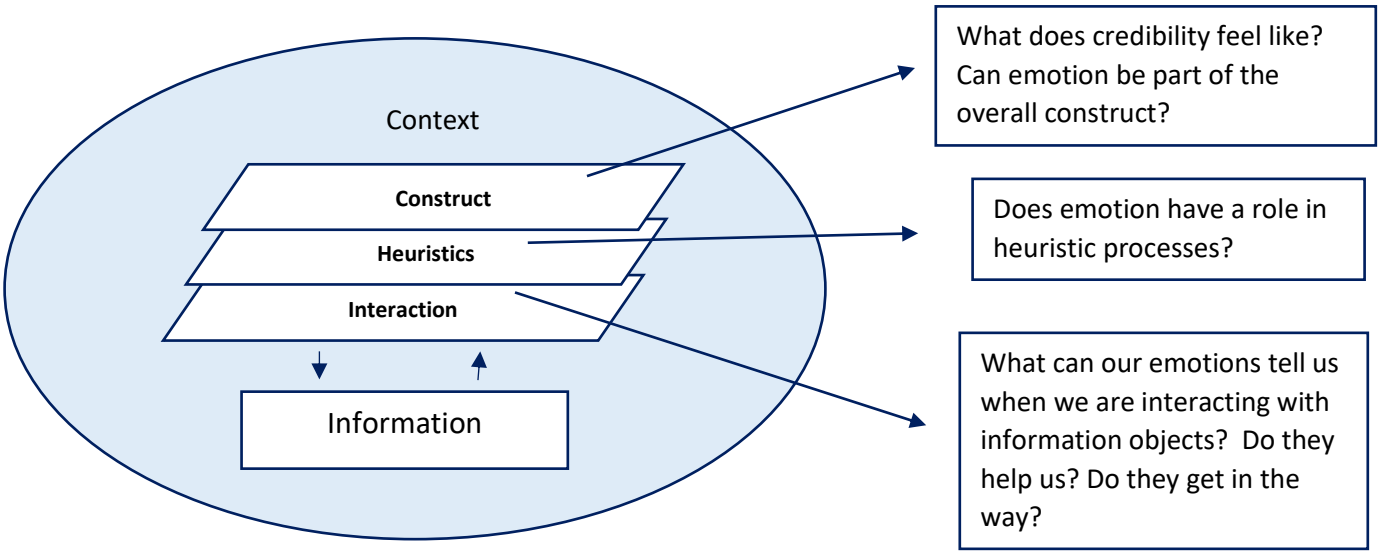
The Construct level is defined as the user's understanding and application of the common constructs of credibility, such as 'truthfulness,' 'believability,' 'trustworthiness,' 'objectivity' or 'reliability' of information; different constructs are applied in different contexts. The particular construct of credibility that is used will guide subsequent credibility judgements, for example, an academic context will be guided more by the construct of objectivity or reliability than trustworthiness or believability. The construct sets the theme for the subsequent Heuristics and Interaction levels.

The Heuristics level refers to the rules or generalized criteria that individuals apply to help judge credibility quickly and easily. Heuristics help with quick and convenient credibility judgements that do not require systematic, context-specific assessment of information. The Heuristics level has 4 subcategories: media-related heuristics, source-related heuristics, endorsement-based heuristics, and aesthetic-based heuristics. Media-related heuristics are rules about the relative credibility of certain media types, for example, Wikipedia is not as credible as a printed encyclopedia. Source-related heuristics are rules based on how familiar one is with a source and whether a source is primary or secondary. Endorsement-based heuristics consider information that is recommended, shared by, or otherwise endorsed by trusted third parties. Aesthetic-based heuristics are rules relating to the design and presentation of information, and its relation to quality.

The Interaction level captures the user's experience with specific information sources in a specific context. The user interacts with information object or source 'cues' while considering the credibility of the information. The Interaction level has 3 subcategories of cues: content cues, peripheral source cues, and peripheral information object cues. Content cues include cues about the credibility of the message itself, such as whether or not it matches content from other sources, or if the quality of the language is good. Peripheral source cues include cues

about the origin of the source, such as the author's affiliation. The peripheral information object cues include design aspects such as image quality, font type, and colour. The authors have included *emotional reaction* as part of this subcategory, showing some acknowledgement of emotion in the process of judging credibility. However, based on the research in Psychology on emotion and decision-making, it is possible that emotion influences credibility judgement beyond interactions with just peripheral information object cues.

Figure 1: Hilligoss and Rieh's Unifying Framework of Credibility Assessment on left (adapted from Hilligoss and Rieh, 2008, p.1474) with added questions showing where emotion may influence credibility on right.



Although the levels are somewhat hierarchical, the authors note that influence can go either way in the structure. From the top down, heuristics are influenced by the overall construct. For example, if trustworthiness is the dominant credibility construct, the heuristics that relate the trustworthiness will be activated, as opposed to heuristics that relate to accuracy or relevance. Heuristics can also shape which cues are considered important in credibility judgements, based on which overall construct is dominant. From the bottom up, the interaction with certain information objects may challenge the wisdom of a given heuristic or even the overarching conceptualization of credibility. For instance, a poor design feature of a '.org' website may override the processing rule or heuristic that all '.org' websites are trustworthy, requiring more

systematic processing of the source, and perhaps a re-tuning of that heuristic. Heuristics and constructs being informed by interaction is presumably how learning and the creation of heuristics and constructs occurs, although the authors do not go into great detail about this process; the capacity of this framework to model learning is one of its strengths and gives credence to its unifying nature.

The dual system of cue and heuristic processing comes from Petty and Cacioppo (1986), who posit that information is processed either systematically requiring more cognitive effort, or heuristically, requiring less effort and time. Hilligoss and Rieh's interactive and heuristic levels of their framework resemble this dual processing theory, with systematic processing of cues at the interactive level in contrast to quicker, more automatic processing on the heuristic level. The distinction between heuristics and interactions with cues was not always straightforward and we opted to make these distinctions in later stages of analysis. For the purposes of collecting data, our study uses the more encompassing term *criteria* to account for any objective qualities of information or actions taken by the participant (e.g. Metzger, 2007).

Another featured of this framework leveraged by our study is the inclusion and relative importance of context. As we noted in our literature review, the exploration of new contexts has driven much of the research into the role of affect. For Hilligoss and Rieh, context has a specific role in that it can restrict how cues and heuristics can be applied. For instance, academic contexts tend to restrict which kinds of sources and content should be considered as credible.

We note a difference in our interpretation and use of one aspect of the Unifying Framework in our study: we do not distinguish between credibility *assessment* and credibility *judgement* as the authors do in their study. For Hilligoss and Rieh, credibility judgements are micro-judgements by which an overall credibility assessment is made:

> Credibility assessment is herein seen as an iterative process involving one or more credibility judgments. As an information seeker encounters information, a series of judgments are made about the credibility of that information. These judgments are based on various factors to be discussed in greater depth in the following sections.

> Taken together, those judgments comprise the credibility assessment which feeds into the decision to accept or reject information. (Hilligoss and Rieh, 2008, p. 1468)

We did not make this distinction in our research, considering credibility judgement to be synonymous with credibility assessment. We felt that it was more straightforward to assume that there was only one decision relating to overall credibility and this we termed a credibility judgement, operationalized when a decision about the credibility of information was made.

2.2.2 Emotion

2.2.2.1 Definition and Operationalization

We noted in the beginning of our Literature Review section (2.1) that in LIS literature the term 'affect' is often used interchangeably with feelings, emotions, moods, and attitudes. More recently, LIS literature has begun to use more specific definitions from Psychology to distinguish these different types of affective phenomena (e.g. Lopatovska and Arapakis, 2011). According to Psychology researcher Scherer, affect is an umbrella term to describe multiple types of cognitive processes like emotion, feeling, mood, attitudes, and preferences, and that each of these terms are distinct (Scherer, 2005). Emotion is often defined as a short-term, intense affective reaction to an event or object, including events within the body (Ortony et al., 1988; Scherer, 2005; Schwarz, 2012). The reaction is usually in relation to a change of internal (physiological) or external (environmental) state, which implicates one's own goals or well-being (Frijda et al., 1989; Scherer, 2005). This is usually defined in opposition to mood, which are affective states that are longer term, and usually not associated with a particular object or event (Schwartz and Clore, 1983; Scherer, 2005). This distinction has been somewhat confounded with the concepts of incidental and integral emotion, which we explain further below (Schwartz, 2012; Lerner et al., 2015).

Emotion is also defined as a component process of various separate but related functions in the individual, which combined result an emotional reaction (Scherer, 2005). These components have implications on whether and how they can be measured. According to Scherer, there are five components of emotion employing five independent subsystems: cognitive, neurophysiological, motivational, motor expression, and subjective feeling. Of these, subjective

feeling is the component to which we have conscious access, as a self-monitoring function that communicates and synthesizes the other components into one patterned reaction. Scherer believed that self-reporting was an acceptable and practical method to study emotions, since self-reporting seemed to be "the only realistic approach to studying naturally occurring emotions" (Scherer, 1984, p. 56). Since our study relies on self-reported behaviour, we are using Scherer's feeling component of emotion, as well as his general definition of emotion as a short-term affective reaction to an object or event. Lopatovska also relied on self-reporting and the feeling component of emotion in her study of primary and secondary emotions, mood, and the search process (Lopatovska, 2014). Primary emotions are instant reactions to events, and are largely subconscious while secondary emotions are cognitive, involving appraisals of the situation and goals at hand (Damasio in Lopatovska, 2014). Lopatovska used this conceptual distinction to justify measuring using two methods: in-the-moment facial recognition for primary emotions (they are unconscious and therefore cannot be self-reported), and self-reporting after the task for secondary, as they require some cognitive processing by the participant. This type of triangulation can be a good way to get reliable results, however, as the distinction between primary and secondary is conceptual and not based on common features, it is difficult to triangulate the results.

Measuring emotion

Relating emotion and credibility in our study hinges on an approach that sees emotion as part of the decision-making process, and credibility as a type of decision-making about information. Research of emotion and decision-making view emotion as an integral part of the decision-making process, as motivation to act (e.g. Frijda, 1989; Zeelenberg et al, 2008), and shapers of our thought (e.g. Schwartz and Clore, 1988; Lerner and Keltner, 2000, Lerner et al., 2015). The appraisal tendency approach to emotion and decision-making defines emotions in terms of how they affect an individual's appraisals of an object or event and influence their *tendency* to make a certain decision about an object or event (Lerner & Keltner, 2000; Lerner et al. 2015). Appraisal tendency theories rely on dimensional models of emotion, which help to define differences among emotions and emotional experiences along different dimensions or

attributes, as opposed to semantic analysis of discrete natural language terms. Whether emotions are defined in terms of dimensions or discrete terms is directly related to how they will be measured.

Emotion can be measured using discrete terms that occur in natural language (e.g. happy, sad, afraid) that might be further categorized using semantic analysis (Scherer, 2005). It is usually in this semantic analysis that any further analysis comparing individuals and their emotion experience, or even the impact of emotion on behaviour. As mentioned above, researchers in decision-making use continuous dimensional attributes, such as valence (good or bad, negative or positive), dominance (high control-low control), and intensity (high intensity-low intensity) (Schlosberg, 1954; Russell, 1983; Smith and Ellsworth, 1985; Scherer, 2005; Lerner et al., 2015). Dimensional models are based on the idea that a specific emotion can be defined in terms of its positioning in relation to multiple attributes shared in common by all emotional experiences. For example, the most fundamental attribute of the emotional experience is valence, or how good or bad, pleasant or unpleasant an object or event is. All emotions can be positioned somewhere along the dimensional attribute of valence.

The advantage of dimensional models in terms of measurement is that an emotion's positioning in terms of the dimensions is both easily distinguishable as well as comparable to other emotions by virtue of their positions along the dimensions; these positions are also quantifiable, allowing for statistical analysis of the emotional experiences (Scherer, 2005). Appraisal tendency theories use the positioning on dimensional attributes as a predictor of how decisions may be made (Lerner et al., 2015). In addition, attributes can be used as categories by which groups of emotions may be compared, allowing also for more practical analysis of the role of emotion in various contexts.

While the dimensional model has developed in terms of how it defines attributes that make up emotional experiences, how this is best used as measuring tool in self-reporting studies has presented some issues. Dimensional models require knowledge of how attributes are developed in order to use them correctly. Self-reports use natural language and discrete terms, individuals do not likely have the insight about these terms in order to accurately find their

emotional experience among multiple dimensions. The Geneva Emotion Wheel combines both discrete term and dimensional attributes by mapping discrete terms onto a dimensional model (Scherer, 2013). The wheel format allows for dimensions to be juxtaposed in 3 dimensions, including control, valence, and intensity. This idea was inspired by Russell's Circumplex model, which used the same circular form juxtaposing 2 dimensions, valence and arousal (Russell, 1983). Both the Geneva Wheel and the Circumplex model were inspired by Schlosberg's placing of discrete emotions in a circular relationship, using pleasant/unpleasant and attention/rejection as his poles for 2 dimensions (Schlosberg, 1954).

For the purposes of this study, we collected emotional data from our participants as natural language of our participants' self-reporting. For our data analysis, we coded the natural language that referred to discrete emotions in order to capture the breadth of emotional expressions related to credibility, similar to Fisher and Landry's study of mothers (Fisher and Landry, 2007). When interviewees use discrete terms, we use these in our coding and analysis, although synonymous terms were coded under one term only (e.g. both "I was scared" and "I was afraid" are coded as fear). When interviewees used common emotional expressions, we coded these as a discrete emotional term (e.g. "What?!!" was be coded as surprise; "Ewww" will be coded as disgust). Feelings that were expressed in general positive or negative terms were referred to a general good or general bad feelings (e.g. "it felt good to find the information I was hoping for" was coded as a general good feeling).

Scherer agrees that self-reporting, although somewhat ambiguous when it comes to which component of the emotional experience is referred, still maintains authenticity, as individuals have the best access to their own experiences. Self-reporting allows individuals to directly express their subjective emotional experiences, providing insight into their internal states that might not be observable by external observers. Emotions can be complex and multifaceted, and self-reporting allows individuals to convey the nuances of their emotional experiences that might not be easily captured through other methods. Nevertheless, some controversy about self-reporting access to emotion exists in the literature. Robinson and Clore make the distinction between emotion (episodic, experiential, and contextual) and beliefs about emotion

(semantic, conceptual, and decontextualized) (Robinson and Clore, 2002). With this in mind, we felt that in-depth narratives would be helpful in providing data that was from real experience and contextualized, rather than focusing on participants own definitions or opinions about how their emotions were influencing their judgements in general, although we do have questions about this as well. We allow participants to define and give general thoughts about credibility, however, which we also felt took the focus away from emotion so that emotional language would emerge more naturally. That being said, the topic of 'emotion and credibility' was known to participants ahead of interviews.

Scherer, 2005 also used the natural language self-reports in the first layer of data collection for his work that eventual lead to the Geneva Emotion Wheel (Scherer et al., 2013). However, in order to analyze the experience of emotion more accurately, Scherer categorized and mapped this language using appraisal dimensions. Because we wanted to provide some basis for analysis of our emotional terms when used in different contexts, we chose to map our discrete terms onto a prototype model from Scherer's earlier work, on which 80 emotions terms are already mapped on a circumplex space based on valence, arousal, control, and conduciveness: the Geneva wheel only maps 16 emotional terms (Scherer, 2005). Scherer's work also includes terms mapped by Russel (1983), which Scherer includes in order to compare his own mapping, and to flesh out the space. For our study, we use this model only to be able to distinguish emotions based on the valence (good/bad) dimension for our analysis. Authors of appraisal dimension frameworks agree that valence (positive or negative) is a fundamental dimension of emotional experiences, and include it in their models (Schlosberg, 1954; Russell, 1983; Smith and Ellsworth, 1985; Roseman et al., 1990; Mehrabian, 1995; Lerner and Keltner, 2000; Scherer, 2005); to some, valence is the most fundamental of all other dimensions (Charland, 2005; Shuman et al., 2013). It is important to note that emotion in our study is the emotion experienced by the *user* (the user's feelings), not the emotion embedded in information content; there is no necessary correlation between the emotion embedded in information and the emotion felt by the user, and the two cannot be equated.

In order to better understand *how* emotions may be influencing credibility judgements, we use two theories from emotion and decision-making in our interview design and analysis:

Schwartz's feeling-as-information theory (Schwartz, 2012) and the concepts of 'integral' and 'incidental' emotion (Schwartz, 2012; Lerner et al., 2015).

2.2.3 Feeling-as-Information Theory

Schwartz's feeling-as-information theory posits that emotions contribute informational value during decision-making processes. The theory is operationalized by the question "how do I feel about it?" which describes how we attend to our feelings about events or objects of deliberation when making decisions (Schwartz and Clore, 1988). Feeling-as-information proposes that emotions can provide important information about an object or event and are not necessarily in opposition to other cognitive processes (Schwartz, 2012). Some of the informative qualities of emotion provide information about what exactly needs addressing at the moment, and how to address it (Ortony et al., 1988; Schwartz, 2012, Lerner et al, 2015). However, both Schwartz and Lerner et al. point out that information from emotions may or may not be relevant to decisions based on whether they are integral or incidental to the decision at hand. We presume this distinction is critical in answering what kind of information emotions may be contributing to credibility judgements, and whether it is helpful or hindering.

Understanding the potential informational value of emotion seems a natural fit for research in LIS. Godbold explored the concept of emotion as informational in her study of an online forum discussion thread for patients experiencing kidney failure (Godbold, 2013). Situating her study in Dervin's Sense-making model, she found that emotional cues provided important and relevant information to the decision-making processes of users. Her study focuses on embedded emotional content and does not extend to the actual experienced emotion of users during their information seeking, nor does it leverage theory from Psychology. However, Godbold helps to make the case for understanding emotion as a source of information, an important conceptual leap for LIS, and one that helps justify the use of feeling-as-information theory and current LIS research in affect and IB.

Zajonc's primacy theory of emotion is used in our design and analysis as well, to help explain the nature of the informative role of emotion when making decisions. Zajonc's transformative publication on the primacy of emotion in the decision-making process brings to bear the issue

of whether emotion is a result of cognitive processes or could be considered a stand-alone criterion for the evaluation of an event or object (Zajonc, 1980). The subtitle, "Preferences need no inferences," encapsulates his idea that the feeling of liking or not liking (preference) is in itself an evaluation requiring very little, if any, cognition. Even though his proposal is decades old, the primacy of emotion remains an unanswered question (Reisenzein, 2019). While we do not seek to rectify this controversy in this study, we use this conceptualization in order to examine relationships between emotion and other criteria of judgement, and to gauge if emotion provides its own unique information or is a result of cognitive processing of other criteria.

2.2.4 Incidental and Integral Emotions

To help identify where and how emotion is influencing credibility decision-making, we use the concepts of incidental and integral emotion to add nuance to the above definition of emotion; these concepts also feature in the 'feeling-as-information' theory (Schwartz, 2012) and Lerner et al.'s work on appraisal tendency, which looks at how emotions influence decision-making (Lerner et al., 2015). Incidental emotion refers to lingering emotions that resulted from a previous event that is not necessarily relevant to the present situation. Integral emotion refers to the reaction resulting from the present event or object. Integral emotions have different informational value than incidental ones in terms of relevance when making decisions. Both can originate as short-term and event-based, however, integral emotions are relevant to the event or object of analysis, whereas incidental ones are carry-over 'echoes' of previous events.

In his feeling-as-information theory, incidental emotion has come to replace 'mood' from his previous affect-as-information theory (Schwartz and Clore, 1983). According to Schwartz, incidental emotion is information that is coming from sources external to the issue or task at hand, while integral emotions relate to the task at hand. The distinction was to demonstrate when information from emotion was *relevant* and possibly useful in decision-making or *irrelevant*, possibly hindering good decision-making. What is confounding is the use of 'emotion' in both cases, suggesting that incidental emotions are different in nature than moods, and closer in definition to emotions (episodic). How exactly they are different is not

always well explained in the literature, and often it is implied that mood and incidental emotion are synonymous (Västfjäll et al., 2016).

When applying incidental emotion in the case of appraisal tendency theory, where emotions have the effect of influencing subsequent risk appraisals, a clearer distinction is rendered. In the appraisal tendency framework (ATF), incidental emotions influence subsequent decisions about riskiness of a situation. The triggers for these emotions can be known, thus they are not necessarily fit the definition of mood, even if the triggers are not relevant to the risk decision at hand. In addition, whereas mood is usually characterized only valance (either good or bad), incidental emotions are distinct with multiple appraisal dimensions (see measurement section below) (George and Dane, 2016). Lerner et al showed that different emotions with the same valence (e.g. fear and anger) could elicit different appraisal tendencies, and therefore are defined beyond the valance attribute, as with other emotions (Lerner et al., 2015). For the purposes of our study, we use this understanding of incidental and integral emotions, which are both episodic, related to external contextual factors or previous incidents, whereas integral emotions relate to the information activity or object at hand.

2.3 Research Goal, Objectives, and Research Questions

The overall goal of this research is to understand the influence of emotion in judgements of credibility in undergraduate students' online IB. To do this, we reframe credibility judgment as having an affective dimension – specifically emotion - by answering our research questions and extending a prevailing model of credibility to include emotion, if the evidence supports this. The research will use qualitative methods to ascertain whether emotion plays an important role in judgements of credibility, and how emotion may influence those judgements, according to the reports of undergraduate students at McGill University. The research focuses on everyday life (health, news, leisure) and academic information contexts in order to gauge whether the influence of emotion varies with these and other situational characteristics.

Our research questions and sub-questions are:

RQ1. Is emotion an important criterion in judging credibility?

a) **To what extent does emotion influence undergraduates' credibility judgements of information found online?**
b) **How does emotion relate to other established criteria for judging credibility?**

RQ2. How does emotion influence undergraduates' credibility judgements of information found online?

a) **Does emotion provide information about a source with regard to credibility? If so, what kind of information does it provide?**
b) **Does emotion help or hinder credibility judgements?**
c) **What characterizes the situations in which emotion influences credibility judgements?**

Using 18 in-depth interviews about the role of emotion in undergraduate IB, we answer these questions and sub-questions, while also looking for support for extending Hilligoss and Rieh's Unifying Framework of Credibility Assessment. By extending this framework, we provide compelling evidence for the inclusion of emotion in future research on credibility. We support our work theoretically by structuring our data collection and analysis on Hilligoss and Rieh's framework, as well as emotion and decision-making theory from Psychology, to help design our interview guides and structure our analysis.

3 Methods

This chapter first addresses the rationale for using a qualitative approach and mixed-methods inductive and deductive coding approach to answer our research questions and sub-questions. We then outline the methods used to select and recruit interview participants, develop and test our interview tool, and how we coded and analyzed the data collected using our inductive-deductive approach.

3.1 Rationale for a Qualitative, Mixed-Methods Approach

The research aimed to explore the influence of emotion on credibility within the context of our theoretical framework. To achieve this, we employed a mixed methods coding approach, combining both deductive and inductive coding strategies to comprehensively analyze the data. The study was grounded in our framework, which provided a guiding lens for the research. The framework laid out the different levels of processing of credibility assessment and integrated feeling-as-information theory and the concepts of incidental and integral emotion to provide a lens for how emotion was influencing these processes, if at all.

Because our research questions ask about the *importance* of as well as *how* emotion influences credibility judgements, we felt that in-depth interviews were the most appropriate to get at detailed reasoning and underlying motivations, where emotion was likely to be a factor. Interview questions probed for what kind of information emotions provided during credibility judgements (RQ2a) and whether or not emotions were helpful when judging credibility (RQ2b). RQ2c was primarily answered through narrative inquiry that provided real-life examples with contextual elements and their relationships. The answers to RQ1 and sub-questions about importance emerged from our participants discussion of emotion in their IB, their discussion of the survey Question 3 which we included in our interview guide, and the analysis based on Hilligoss and Rieh's Unifying Framework, which is itself and extensive and in-depth model of credibility.

The data analysis process followed an iterative and reflexive approach. This iterative process was repeated until saturation was achieved, ensuring that all relevant data had been exhaustively coded under the deductive categories. We reviewed the data again, searching for

new themes that emerged from the data itself. These emergent themes led to the identification of additional categories that were not initially captured by the theoretical framework. Throughout the analysis, the identified inductive codes were constantly compared and related back to the deductive codes. This process allowed us to explore how the new concepts and ideas identified through inductive coding either complemented or challenged the existing theoretical framework. This iterative approach ensured a comprehensive analysis that encompassed both theory-driven and data-driven insights. By incorporating both deductive and inductive coding in our analysis, we were able to draw on the strengths of both approaches, leveraging the theoretical framework's guidance while remaining open to the emergence of novel concepts from the data. This mixed-methods coding approach provided a rich and nuanced understanding of emotion and credibility within the context of our framework.

3.2 Participants and Recruitment

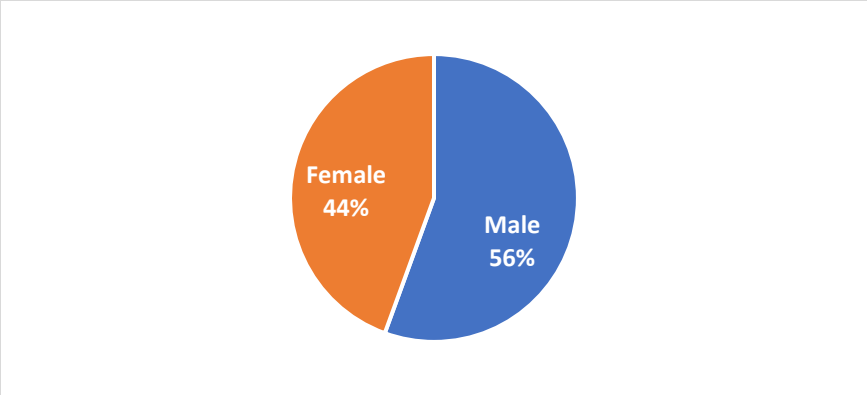
3.2.1 Sample frame

Selection of participants was purposeful and convenience-based, recruited from a pool of candidates generated from the participants of the survey mentioned in our Literature Review (PIs Jamshid Beheshti and Joan Bartlett) (Teddlie and Yu, 2007; Creswell, 2009). We aimed to get a sample representing as many faculties at McGill as possible, with a variation of gender, age, faculty, and residency status (Quebec residents, Canadian residents, International students).

3.2.2 Recruitment

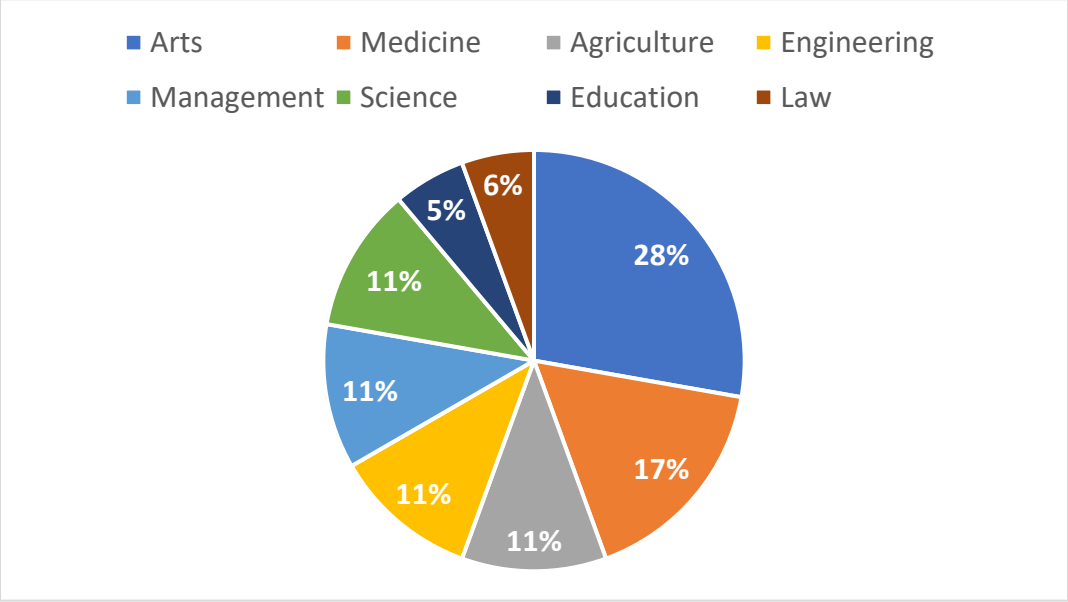
Interview participants were recruited from a pool of approximately 1200 volunteers, generated through an extra-to-survey question. After finishing the survey, those who indicated they would be interested in being contacted for a future interview were redirected to a separate survey in order to preserve their anonymity from their survey responses. They were prompted to submit their full name and email. Those on the email list were contact by the RA of the survey project and asked if they consented to being contact for our study. Those who agreed were then screened and purposefully selected.

Figure 2: Participants by gender



We selected and interviewed a total of 18 participants. Of these, 8 identified as female and 10 identified as male (Figure 2); we did not receive any candidates identifying as non-binary. Our interviewees were from 8 different faculties (Figure 3): 2 Agriculture and Environmental Sciences students; 5 Arts students; 1 Education student; 2 Engineering students; 1 Law student, 2 Management students; 3 Medicine students; and 2 Science students. We did not receive any volunteers from Dentistry or Music and felt that this was reasonable as they were the two smallest faculties.

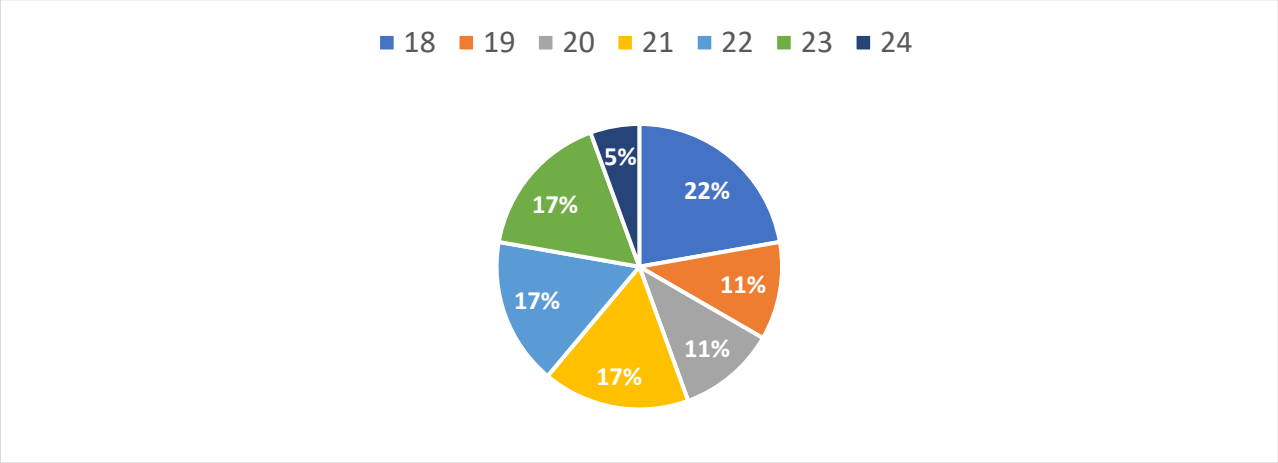
Figure 3: Participants by faculty



We chose only to focus on age rather than level of study when recruiting for interviews, as the study aimed to understand undergraduates as an age-based category, rather than level of

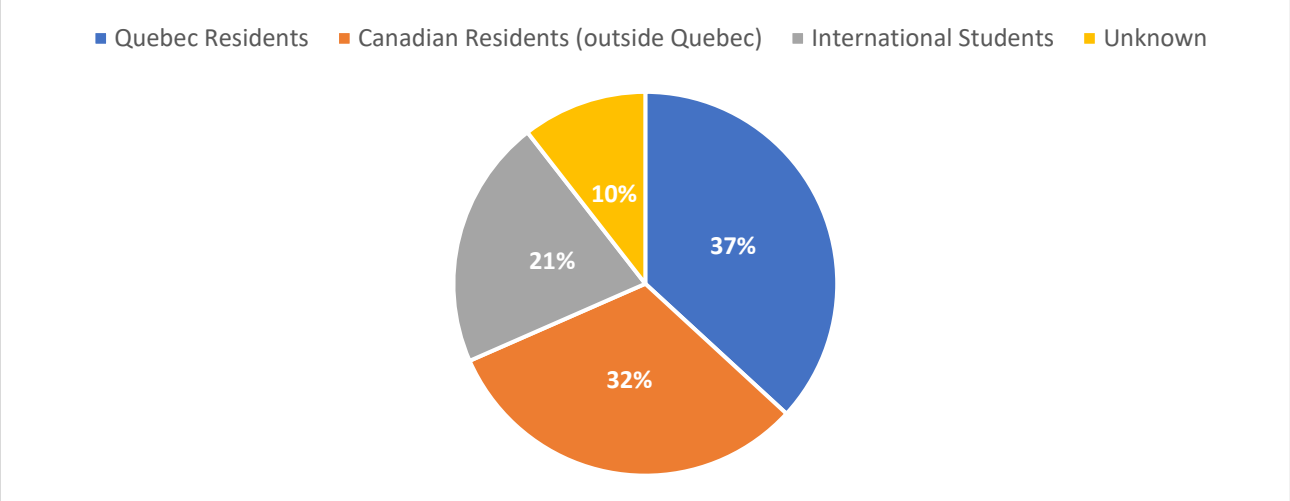
study. Here, we aimed for a variety of ages (Figure 4): 4 eighteen-year-olds; 2 nineteen-year-olds; 2 twenty-year-olds; 3 twenty-one-year-olds; 3 twenty-two-year-olds; 3 twenty-three-year-olds; and 1 twenty-four-ear-old.

Figure 4: Participants by age



We also wanted to get perspectives from outside Quebec and Canada, and looked for a balance of Quebec residents, Canadian (outside of Quebec) residents, and International students. Figure 5 shows the ratio of our participants by status.

Figure 5: Residential Status



3.3 Interview Guide Development and Process

3.3.1 Framework

The interview guide was informed by a review of the literature on credibility and emotion. Theory that directly contributed to the development of the interview guide was the Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008), 'feeling-as-information' theory (Schwartz, 2012), and concepts of incidental and integral emotion (Schwartz, 2012; Lerner et al., 2015).

3.3.2 Interview guide

Using our theoretical framework (described in 2.2), questions to operationalize the concepts of emotion and credibility were developed in draft. The draft was reworked with the dissertation committee, until it was considered ready for pre-testing. See Table 3 for interview questions and corresponding research questions.

Detailed instructions and supporting documentation that outlined each step and the script that would be used to welcome each interviewee and orient them to the interview topic and process were also developed with the help of the dissertation committee (See Appendix 1: Interview Guide and Consent Form).

The interview guide was pre-tested with 3 different participants from the Master of Information Studies program at McGill. After each pre-test, notes and suggestions taken during the interview were reported to the dissertation committee, as well as any changes to the interview guides that were adopted. After the 3rd pre-test, a final interview guide was approved for the piloting.

The interview guide itself begins with questions about what participants spontaneously thought of when they heard the word 'credibility'; we asked a similar question about the words 'credibility judgement.' We did this in order to identify their concept of credibility and ensure the face validity. As mentioned in our theoretical framework section, we chose not to do this with the term 'emotion' so as to let answers about their emotion emerge more naturally, in order to get at actual experience and context, rather than beliefs about emotion (Robinson and

Clore, 2002). This was not a deception, however, as participants knew that the study was about the role of emotion in credibility judgements.

The next section of interview questions focused on participant IB in relation to finding and using credible sources for various information topics; participants were encouraged to explore differences in the sources they considered credible for different situations. At this point, themes relating to feelings or emotions begin to emerge, and questions start to focus on emotions and credibility judgements. Questions focus on how different criteria, including emotion, might provide information by which to judge credibility, in order to answer RQ2a. In order to answer RQ2c about circumstances and situational characteristics there is an open-ended question asking participants to elaborate on a particular incident when they had to judge the credibility of information.

To answer RQ1b the guide asks the investigator to give the participant a list of the 9 criteria that were used in the survey from another study. We used the survey items originally to explore results from the survey (we decided not use the survey results), and left them because they were drawn from a review of the literature (with the exception of the last criterion "My good or bad feeling about a website or source") and were considered to be well-established criteria of credibility (Beheshti et al, 2018; Bartlett et al, 2020). We decided to use the survey question later in the interview to let criteria that were not on the survey emerge without influence. The investigator asked the participant to discuss the importance of each criterion, and any relationships between them, with particular focus on "My good or bad feeling…."

The final question on the guide asks participants if they felt that their emotions 'helped or hindered' their credibility judgements in order to answer RQ2b. An additional question was added on to some interviews, regarding mobile technology, and whether using a cellphone changed credibility behaviour at the request of the PI from a related study. However, this data was not used in the other study and was absorbed into our analysis.

The guide was piloted with two different undergraduate students. Minor changes were made to the order of some of the questions after the first pilot, but in general, the interview guide

remained the same for the remaining interviews, so the pilot data were included in the overall analysis of the interviews. The interviews were semi-structured: while the interview guide set the standard and overall structure for the interview, in practice there was frequent back and forth conversation between the investigator and participant, and probing, particularly when the participants were having trouble understanding questions about their emotion or discussing their emotion around certain situations (Given, 2008; Brinkmann, 2014).

Table 3: Interview guide with RQ goals and corresponding conceptual framework source

Interview Guide Questions	RQ Goal	Conceptual Framework
What do you think of when you hear the word "credibility"? • Does it change with the topic? • How about "credibility judgement?"	RQ1	Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008)
What do you look for to help you judge the credibility of an online source? • Does it change with topic?	RQ1	Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008)
When you are looking at information online, do you ever get a feeling about the source? • What kind of feeling – how would you describe it? • Is it strong or weak? • What is it telling you?	RQ2a	"Feeling-as-information" theory (Schwartz, 2012)
When do you get the feeling? • Right away? Does it change over time (while reading, next time you visit the site)?	RQ1b	Primacy of Emotion (Zajonc, 1980)
Does this feeling come into play in your judgement of credibility of the source? How? • When does it come into play? • Does it depend on the topic? • Does it depend on the source?	RQ1&2	Incidental vs integral emotion (Schwartz, 2012; Lerner et al., 2015) Primacy of Emotion (Zajonc, 1980)

Narrative 1: Can you describe a situation when you had a good or bad feeling about a source? (RQ2) • If you have trouble thinking of a situation, where was the last place you looked for information about your (Health, Leisure, News, Academic)? • What gave you the feeling? When did it happen? • What did you finally decide about the credibility of the source? What did you consider when you made that decision? • Did your good or bad feelings help you decide if the source was credible? • Is this a typical example of how you judge credibility, or out of the ordinary?	RQ2c	"Feeling-as-information" theory (Schwartz, 2012) Incidental vs integral emotion (Schwartz, 2012; Lerner et al., 2015)
Narrative 2: Can you describe a situation when you had a good (bad) feeling about the credibility of a source?	RQ2c	Same as above
Look at the survey question in front of you – do you use any of these criteria for judging credibility? Are they related? • Which are more important to you? How does 'good or bad feeling' rate in these? • Do your feelings come at the same time as the other criteria? • Do your feelings relate to the other criteria or are they completely separate? • Does the topic make a difference? • Have you ever had to make a credibility judgement on just a feeling?	RQ1b	Incidental vs integral emotion (Schwartz, 2012; Lerner et al., 2015) Primacy of Emotion (Zajonc, 1980)
Do your feelings help or hinder your credibility judgements?	RQ2b	"Feeling-as-information" theory (Schwartz, 2012) Incidental and integral emotions (Schwartz, 2012; Lerner et al., 2015)

3.3.3 Interview Process

Interviews took place in the private office of the investigator at the School of Information Studies at McGill during the week during the final exam period of the Spring semester, in April 2018. Interview sessions lasted from 60 to 90 minutes and interviewees were compensated at $25 per session.

3.3.4 Interview Environment and Consent

During the interview only the investigator and participant were in the room. Participants were given their own desk and chair area to make themselves as comfortable as possible, as well as offered snacks and drinks to serve themselves at any point. Interviewees were greeted and given the consent and confidentiality agreement to read and sign; participants had as much time as they needed to read and sign the form (Appendix 1). They were then given an envelope with their $25 compensation and asked to sign a receipt showing they received payment.

After a brief chat to orient the participant with the process and general topic of the interview, a recorder was place on the table and started. The first question was asked, and the interview continued until the final question was answered, and the investigator asked if the participant wished to ask any questions or redact any information. Only one participant asked to have some information redacted – those areas were removed from the transcripts. The recorder was turned off when the participants stated that they did not have any information to add. The participant was thanked and informed that s/he was welcomed to contact me at any time to make changes to his/her interview data; participants were then accompanied out of the office to the front door of the building. In two cases, emails were exchanged in the day or two after the interview, about information that had come up during the interview, but nothing that related to changes to the interview data itself.

3.3.5 Confidentiality and Data Storage

Identifying data (names, contact information) were kept separate from all other data on a paper copy locked in a cabinet in the office of the supervisor of the PI; a random numerical code was assigned by the researcher for data analysis and storage. Identifiable data given during the interview was coded anonymously (with relationships instead of names), and names or other identifying data were deleted permanently.

All recorded data was transferred from the recorder immediately after the interview and stored on separate drive, which was kept in a locked cabinet in a locked office while not in use; data was deleted from the recorder permanently after transcription. Any notes or paper-based transcripts were transcribed to electronic format without identifying information and kept on the researcher's password protected OneDrive account allotted by McGill university; paper documents were shredded after the transcription process; paper receipts for interview payments will be shredded after seven years. Interview recordings were transcribed for coding; coded data is being kept protected in the researcher's password-protected OneDrive account and backed up on the drive in a locked cabinet in the supervisor's locked office until the results are generated and the study is finished.

3.4 Data Analysis Strategy

At the outset of the analysis, we utilized deductive coding based on the predefined categories and concepts derived from the framework. These predetermined codes were used as initial themes to guide the initial data analysis. We identified specific variables or constructs from the theoretical framework and used them as a starting point for coding the data. Simultaneously, we employed inductive coding to allow for the emergence of new concepts and themes directly from the raw data. By adopting an open-minded and exploratory approach, we closely examined the data to identify patterns, recurring themes, and any unexpected insights that might not have been covered by the theoretical framework.

For specific coding strategies, we used Saldana's approach to coding principles, which describes coding as "heuristic (from the Greek, meaning 'to discover') – an exploratory problem-solving technique without specific formulas or algorithms to follow." (Saldana, 2016, p. 9). Codes were

used as labels that provide some interoperability in disparate language used by different participants to describe similar things. Coding was our first-layer analysis tool to create meaning among various examples by linking across interviews.

3.4.1 Coding Process

All interview data was transcribed with the aid of transcription software SoundScriber, which is available free under GNU software licenses, and was downloaded from the University of Michigan website by recommendation of a McGill librarian[5]. We printed and read through each transcript to begin the deductive process of coding, by finding general themes and areas of interest to focus on – this is the recommendation from Bernard and Ryan's system of coding (2010), as a step before more granular coding, to help orient the researcher to the important overarching themes. This process was repeated after the granular coding to find more detailed themes emerging from the relationships between codes, and differences and similarities among the interview participants. Quotes that represented important themes were also identified during the second paper-based wave of analysis.

The rest of the coding process was performed using qualitative analysis software, Atlas.ti (V.8). [6] Codes were employed in multiple, iterative cycles of coding and analysis. This led to the formation of a number of overarching themes; these themes emerged by using focused coding strategies, which aimed to answer our RQs and provide the grounds to extend the Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008).

3.4.2 Deductive Coding Approach

We first applied a thematic sweep of the data based on our theoretical framework and some of the concepts and theory that we established in the literature.

'Concept coding,' or using codes that represent already established broader meanings, helped focus our coding efforts on those concepts that would answer our questions, but focus broadly enough to allow for conceptual development beyond the literature. In the case of this study,

[5] http://www-personal.umich.edu/~ebreck/code/sscriber/
[6] https://atlasti.com/

concepts from IB research were used to distinguish IB processes to help us understand where emotion may be affecting those processes and to isolate credibility as part of the IB lifecycle. IB concepts included processes like 'encountering,' 'avoiding,' 'continuing,' and 'sharing'. Concept coding was also used to distinguish constructs and criteria of credibility and credibility judgment, and theories of emotion, such as 'incidental emotion' and 'integral emotion.' We used common concepts in credibility, particularly 'criteria' of credibility, which we purposefully kept as broad as possible, based on the grounded approach used by Fogg et al. (2003), Savolainen (2011) and Kim et al. (2011; 2014). Emotions were coded based on our description in the theoretical framework, which included using natural language and expressions in order to capture a wide scope of emotional terms, similar to Fisher's study (2007). Emotion codes also included concepts from our framework such as incidental and integral emotion, and emotional primacy. These concept codes were sometimes used as meta-categories under which more granular 'descriptive coding' methods were used to create an inventory of common items related to the overarching concepts, for example, 'sources,' 'emotions,' and 'criteria.' Descriptor codes fleshed out categories and provided the common language and contexts for looking at emotion and credibility judgement.

In order to ensure more accurate representation of frequency and co-occurrence, we used different coding strategies to capture the parameters of an object, event, or concept. For example, information topics codes usually applied continuously to an entire dialogue (e.g. Health Information, News Information) and were coded as large, single unit sections. Narratives were coded in the same way to quickly identify the parameters of a single narrative for analyzing situational factors, as well as to maintain an accurate account of the incidents. Descriptive or inventory-type codes such as types of emotion and criteria were often used, sometimes multiple times in one section, because they were not usually talked about continuously but needed to be coded frequently enough to capture co-occurrence with other codes and changing contextual factors. These code groups are coded consistently in this way, and as such can reliably be compared with each other for frequency analysis. Outcomes and IB-related codes mapped to the relevant part of the IB lifecycle. In general, like codes, or codes that would likely be used comparatively were coded using the same strategy.

3.4.3 Inductive coding

The general approach to the inductive analysis comes from Glaser and Straus' Constant Comparative method, which uses comparison among participants, codes and themes to build theory:

> …the constant comparative method is concerned with generating and plausibly suggesting (but not provisionally testing) many categories, properties, and hypotheses about general problems (e.g., the distribution of services according to the social value of clients). Some of these properties may be causes, as in analytic induction, but unlike analytic induction, others are conditions, consequences, dimensions, types, processes, etc. In both approaches, these properties should result in an integrated theory. (Glaser and Strauss, 1967, p. 104).

When a code emerged outside of our conceptual framework, it was coded using natural language, and sometimes evolved into a new theme or important concept, as with the case of 'trust,' which was not originally part of the conceptual framework but emerged as an important concept from the interviews. Where new concepts and themes tended to emerge from the data inductively were in the interactions between credibility and emotion, which was the area that is undertheorized and therefore required a more grounded theory or exploratory approach. Codes included emotion leading to checking credibility, changing one's feelings about credibility, and those around the theme of trust. See Appendix 2 for codes and descriptions.

3.4.4 Second Cycle Coding and Theme Development

Second cycle coding strategies were used to show relationships, processes, incorporating established and emerging concepts (Saldana, 2016). 'Versus' coding was used to discover conflict or some other kind of relationship; for example, 'Information versus Entertainment' where participants noted that they sometimes used non-credible news sources when they sought to be entertained or 'credibility vs relevance' where participants noted information could be credible but not relevant to their needs. Causation coding was employed in second-cycle coding and analysis of the descriptive coding inventories. Causation was discovered

through co-occurrence of codes in the text; for example, causation between an emotion and a certain IB outcome was revealed through code co-occurrence. Similarly, process coding, which yielded 'ing-codes' emerged when it became clear that a series of events formed a process, which was common among participants. Codes such as 'building trust' and 'losing trust' emerged from this kind of coding. Causation and process coding were used to understand how and where emotion may be influencing the IB process in general, and credibility judgement specifically.

A final coding approach involved tidying up of codes as well as combining of similar or co-occurring coding. We combined some similar criteria to make the subsequent analysis stronger (e.g. 'backed up' and 'references' were combined under one 'backed up/references' code). As mentioned above, we used language from the survey, both in our interview and in our subsequent coding labels, although in some cases we modified or split up categories. For example, we used 'quality of language' verbatim, but extended 'other users' reaction' to include 'experiences' as we felt this was a key aspect of the code concept. We also combined some closely related emotional terms for stronger analysis, particularly if they were co-occurring in the data (e.g. 'accomplished' and 'affirmed' were combined as accomplished/affirmed). Realising we needed a way to categorise our multiple emotional codes by valence for strong analysis, we used Scherer's Alternate Dimensional Structures graph to map emotions by valence (Scherer, 2005). A full list of emotion codes is included in the results chapter.

Overall themes came together after a few passes of coding and comparing among participants; complex themes which were reported such as 'trust as heuristic' and 'managing emotions.' Our analysis was given some thematic structure using Hilligoss and Rieh's Unifying Framework, which we used to report overarching themes in our results chapter. The following subsections give more details on how we coded data and found themes.

Table 4: Coding scheme with overarching categories and themes (see Appendix 2 for details)

Major Categories/themes	Subcategories and Codes
Affect as Information	Emotion after judgement; emotion before judgment; emotion as helping, emotion as hindering; emotion leading to checking; emotion stopping checking; incidental emotion; integral emotion; need to do something
Credibility Construct	Credibility; credibility judgement; credibility vs accessibility; credibility vs agreeableness; credibility vs relevance; information vs entertainment
Credibility Processing	less checking, more checking, no checking; change opinion/feeling/thought; believe/use info; disbelieve/don't use; judging before checking; judging after checking
Criteria	Types of criteria (multiple); criteria as info
Demographical	Age, faculty, gender
Emotion and Criteria	Types of emotion (multiple); emotion vs criteria; managing emotions
Information Behaviour	Bookmarking, branching, encountering, engaging in social media; posting/commenting; seeking/scanning; sharing; superficial reading
Outcomes	Avoid source, continue searching/scanning; sharing, source preference; stop searching/scanning; unfriend/don't respond; worst case scenario
Situational Factors	Topics (Health, news, leisure, academic); Convenience; Cost; Current Political Climate; Importance; Information overload; Lack of sources; Urgency/Time constraint
Source	Types of sources (multiple)
Trust	Building trust, losing trust; types of trust (multiple)

3.4.5 Analysis – Extending the Unifying Framework and Answering the RQs

During analysis, we used the metric of the number of occurrences (grounding scores) generated in Atlas.ti as a representation of frequency or importance of a code in the data. We also used how many participants (files) reported particular codes in their data, to show common experience in our sample. When ranking the importance or occurrence of various code

categories (e.g. criteria, emotions) we usually sorted first by occurrence then number of participants because occurrence numbers showed more granular differences.

Tools in Atlas.ti that were used during analysis included code co-occurrence, to find when certain ideas occurred together, for instance, which particular emotion co-occurred with certain criteria. We also used document-code comparisons to look for variations by participant, although most of our analysis looked at themes as emerging from the group at large. Word searches also helped to ascertain ubiquity of codes, locate coding selections, and find relationships in the data.

We used our conceptual framework both to create coding, and also to pull themes, for example, our use of integral and incidental emotion helped us to find differences in the roles of emotions by information topic, as well as differentiate how emotions were influencing credibility judgements, for example, whether they helped or hindered judgements.

Most of our themes emerged from our use of Hilligoss and Rieh's Unifying Framework, which we used to structure our analysis and make the case for extending the framework to include emotion, we presented themes under each component of the framework in the qualitative section of the Results Chapter. During our analysis stage, we allowed themes to emerge based on our conceptual framework, but also from grounded theory approach, identifying themes that emerged naturally that may not fit our framework, but are clearly important in answering our RQs and to the overall topic of emotion in credibility and credibility judgements.

4 Results

This chapter presents the findings from 18 interviews of McGill undergraduate students' information behaviour (IB) with respect to credibility and emotion. The objectives of our study were to answer our RQs, as well as extend Hilligoss and Rieh's Unifying Framework of Credibility Assessment (Hilligoss and Rieh, 2008).

The first subsection looks at some of the descriptive aspects of our data, including the discrete emotions reported by our participants in relation to their credibility judgements and closely related IB, the different criteria participants used when judging credibility, and emotion as a criterion of credibility. We use these results to help answer RQ1 about the importance and extent of emotion in credibility judgement. The subsequent subsections are structured based on Hilligoss and Rieh's Unifying Framework of Credibility Assessment in order to show where emotion fits into the different parts of the framework, while also exploring individual themes that help answer our RQs. In the final subsections, we present themes that helped to answer our RQs but did not fit under the framework categories.

4.1 Emotions and Credibility

Discrete emotions were mentioned during descriptions of credibility judgement, as part of closely related IB (e.g. starting, continuing, stopping searches), and situational factors that made part of the credibility context. We found a total of 33 discrete emotions that emerged throughout the interviews as well as general good and general bad feeling. The terms 'general good,' and 'general bad' were used when the participant did not or could not identify a discrete emotion, just a general bad or good feeling, or in cases where participants were talking about their usual behaviour in general terms (e.g. if I feel bad about x, then I usually do y). Their use was frequent, and we chose to report them along with, but separate from, the discrete emotions, which were normally reported with respect to specific examples or contexts. General Good and General Bad categories for emotion are not to be equated with 'intuition or gut feeling,' which are debated as to whether they are considered emotions or another cognitive phenomenon, sometimes more directly related to physical sensations rather than affective ones (e.g. 'I had a gut feeling about it') (Lipshitz and Shulimovitz, 2005; Lufityanto et

al., 2016). They are also often considered to be largely unconscious, which differs from our coding definition; we only coded these when our participants spoke about their good or bad feelings, rather than when they could not describe the cognitive process (e.g. 'I'm not sure why I chose it' or 'it just made sense'). Both General Good and General Bad are considered to be part of our definition of emotion since they can be defined by the valence dimension found in the most well-established dimensional models of emotion (Smith and Ellsworth, 1985; Roseman et al., 1990; Learner and Keltner, 2000; Chartrand, 2005; Barrett, 2006; Lerner et al., 2015).

Table 5 shows the discrete emotions ranked by number of occurrences and then how many participants mentioned them. It also shows the valence of that emotion as measured by Scherer's Alternate Dimensional Structures graph, indicated by a – (negative valence) or + (positive valence) (Scherer, 2005); see Appendix 3 for mapping of emotions using Scherer's graph. In the cases where our coding system did not use the exact language of Scherer's graph, we used synonymous terms[7] from the graph; terms borrowed from Scherer's graph are in brackets.

[7] Synonyms from Thesaurus by Merriam-Webster: https://www.merriam-webster.com/thesaurus

Table 5: Discrete emotions ranked by overall occurrence then number of participants who report it, Scherer categories in brackets. Feelings of general valence shown below (no ranking).

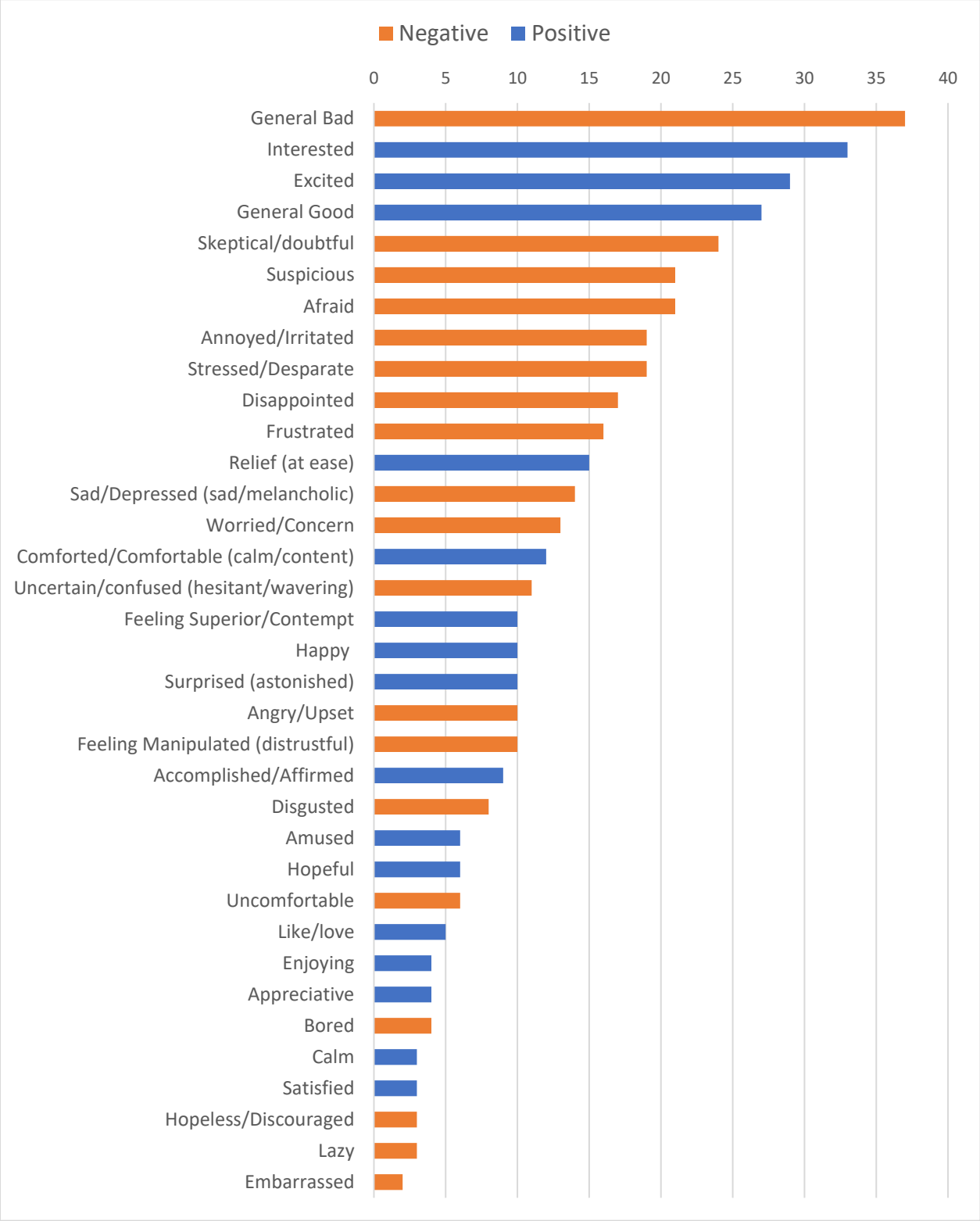
Rank	Emotion	Valence	Occurrences	Number of Participants
1	Interested	+	33	11
2	Excited	+	29	11
3	Skeptical/doubtful	-	24	11
4	Afraid	-	21	10
5	Suspicious	-	21	10
6	Stressed/Desperate	-	19	9
7	Annoyed/Irritated	-	19	8
8	Disappointed	-	17	12
9	Frustrated	-	16	6
10	Relief (at ease)	+	15	7
11	Sad/Depressed	-	14	6
12	Worried/Concerned	-	13	9
13	Comforted/Comfortable (content)	+	12	5
14	Uncertain/confused (hesitant/wavering)	-	11	7
15	Surprised (astonished)	+	10	8
16	Feeling Manipulated (distrustful)	-	10	7
17	Happy	+	10	7
18	Angry/Upset	-	10	6
19	Feeling Superior	+	10	4
20	Accomplished/Affirmed (self-confident)	+	9	7
21	Disgusted	-	8	5
22	Hopeful	+	6	5
23	Amused	+	6	4
24	Uncomfortable	-	6	4
25	Like/love	+	5	5

26	Appreciative	+	4	3
27	Bored	-	4	3
28	Enjoying (delighted)	+	4	3
29	Lazy (apathetic)	-	3	3
30	Satisfied	+	3	3
31	Hopeless/Discouraged (despondent)	-	3	3
32	Calm	+	3	2
33	Embarrassed	-	2	2

/	General Bad	-	37	13
/	General Good	+	27	15

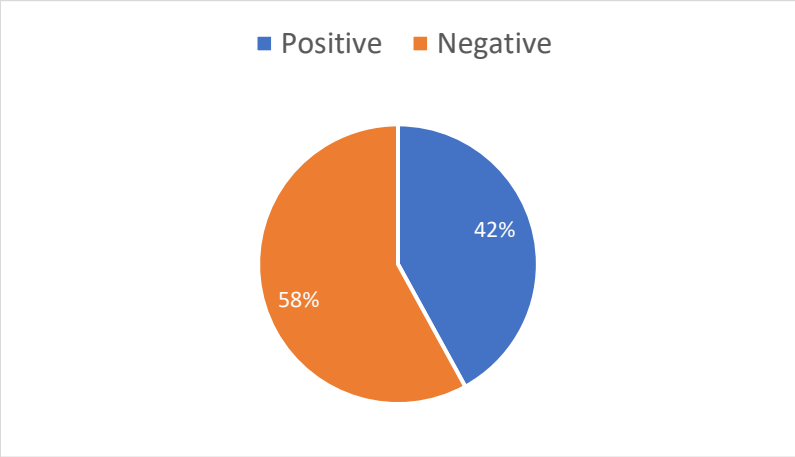
Since we used natural language and expression to code emotions, we used as many distinct terms as we could detect in order to see the full scope of emotional expression. Exceptions were with the use of expressions or descriptions of emotions (e.g. “What?!” = Surprised; “It can really bother me” = Irritated) and very similar terms, which we included in the coding (e.g. Angry/Upset). Two emotions that we found in our data did not have a suitable synonym on Scherer’s graph: appreciative and liking/loving. We chose a positive valence as liking or love and appreciation are considered a positive valence emotion in other literature on valence and discrete emotions (Tugade et al., 2014; Kranzbühler et al., 2020).

Figure 6: Occurrence of emotions showing valence.



As discussed in the Theoretical Framework section (2.2), the valence appraisal dimension is a fundamental to the emotional experience, perhaps the most fundamental (Charland, 2005; Barrett, 2006), thus we felt this was the best and most straightforward approach for our analysis in an exploratory design. We can see in Figure 6 that there is both a variety of both positive emotions (blue) and negative (orange) that are associated with credibility judgement, as well as a balance between the two (positive = 42% of occurrences; negative = 58% of occurrences – see Figure 7). Future studies would benefit by looking at other appraisal dimensions, as we will mention in our Discussion chapter. When comparing the valence of our top 10 emotions, we see that, while the top 2 emotions are positive in valence, most of the others are negative in valence.

Figure 7: Ratio of negative to positive emotions (total)



By cataloguing the wide variety of emotions reported in our interview data, we can show the scope of emotional experiences as they relate to credibility judgements and flesh out emotion as a criterion of credibility judgement as well. This will also help answer RQ1 and RQ1a about the importance and extent of emotion in credibility judgements.

4.2 Criteria of Credibility

Similar to our approach with emotions, we looked for any criteria identified by participants as part of the credibility checking process, including those already identified in the literature (e.g. Fogg et al., 2000; Metzger et al., 2003; Kim and Sin, 2011; Beheshti et al., 2018), as well as any

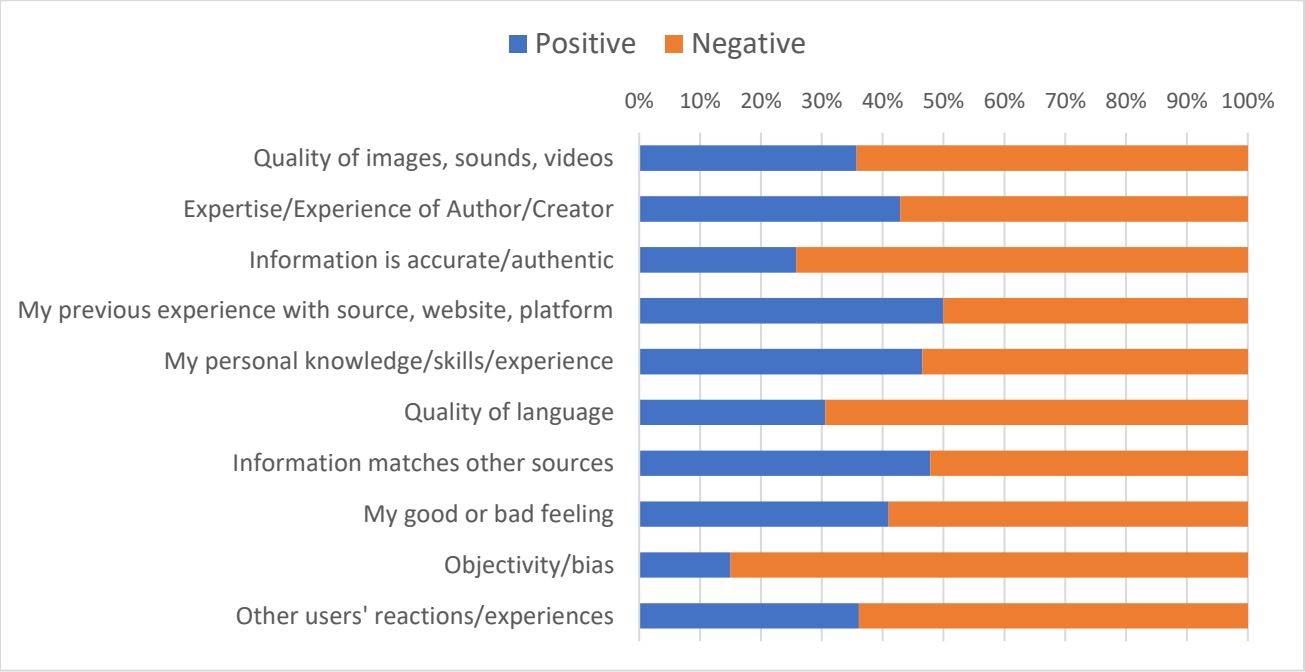
new criteria not yet identified, similar to the approach of Fogg et al. (2003), Savolainen (2011), and Kim et al. (2011, 2014). We did this in recognition that online information contexts are continuously evolving, and that we were also looking across multiple information topics (news, health, leisure, academic). We considered criteria as encompassing both the qualities of information objects considered when checking credibility (e.g. Fogg et al., 2003; Beheshti et al., 2018) as well as user-based strategies or actions taken to check credibility (e.g. Kim et al., 2011.

Criteria emerged when participants reported what they did to check for credibility or what they considered in their credibility judgements, either while recounting a narrative or when explaining their usual behaviour. We coded 35 distinct criteria for judging credibility. We used some of the language from the survey items in Question 3 to code criteria that have already been identified in the literature, otherwise we used the natural language as much as possible, with some combining of similar terms. Figure 8 shows our criteria ranked highest to lowest first by occurrence then by number of participants who reported them. The number of occurrences shows how ubiquitous it was throughout the interview data, while the number of participants shows how common the experience in our sample (See Appendix 4 for a full list of criteria with participant numbers. The numbers may have been somewhat skewed as some of these criteria were also in the survey tool, which was incorporated into the interview guide. However, the question about the survey occurred near the end of the interview and only represented a small part of the interview data; removing these occurrences did not change which criteria were in the top 10 but did change their order somewhat; we chose to report the full data in our results. Those in blue show criteria that can be found in the literature and those in orange show criteria that emerged from our study. We found 5 that could be said to have emerged from our study: My good or bad feeling about a website or source (which was part of our data collection design); My intuition/gut feeling; Popularity/wide use; Information or references are obscure/strange; and Anticipating prof's judgement. Intuition/gut feeling was only coded in in the case were the words “intuition” “instinct” “gut feeling” or “hunch” were used, with no associated valanced feelings (see Appendix 2 for code descriptions).

Figure 8: Criteria for judging credibility ranked by occurrence.

Figure 9 shows a comparison of the valence for the top 10 criteria. We chose to report our top criteria as patterns were more meaningful with higher occurrences (see Appendix 4 for a complete list). Keeping in mind that there were more negative emotions than positive ones in general, the data shows some tendencies for certain criteria to be associated with a particular emotional valence. For example, 'My previous experience with a website, source' and 'My personal knowledge/skills/experience' had the highest ratio of positive emotions (both at 55%), whereas Objectivity/Bias and 'Information is backed up/referenced' (23% and 21%, respectively) were lowest. It is of note that more positive emotions were associated to subjective criteria, whereas more negative emotions were associated with objective criteria. We explore this further in subsequent subsections.

Figure 9: Comparing the ratio of emotional valence of the top 10 criteria.



4.2.1 Emotion as Criteria of Credibility

Emotion as a criterion of credibility (coded as 'My good or bad feeling') was ranked as 3rd out of 35 criteria. This code was used whenever a participant reported using their feelings during the credibility judging process. While 'My good or bad feeling' was sometimes referred to as a criterion for judging credibility on its own, more often it was mentioned in association with

other criteria Therefore, as a criterion, its representation among the top 10 criteria is mostly in combination with or as a complement to other criteria, providing information about that criterion and forming a relationship which we explore further on in our results and discussion. Specific discrete emotions were coded with criteria and could include multiple discrete emotions. For example, in this selection, our participant P1 explains how his feeling of surprise (indicated by the expression "WHAT") makes him leery of the credibility of a headline and want to check the information further:

> …if see a headline that says "drinking soda causes cancer" I would be like "WHAT? Where did you get that" that's when I start questioning the source and everything, is it really reliable, is it really credible, that's when I question it, in terms of health, if they just make ridiculous conclusions or make assumptions, or links between stuff that are completely unrelated and make it as a headline, then I will wonder what the source is, who the source of the article is. (P1)

This example is coded as 'my good or bad feeling' and 'surprise' as well as 'clickbait/sensationalism.' The coding shows the relationship between the emotion as a criterion, the discrete emotion itself, and the sensationalism of the headline. Figure 10 shows the top 13 criteria by co-occurrence with My good or bad feeling. We found that certain criteria were more commonly associated with the emotion when being used to judge credibility.

We were also able to support this finding with a direct question to our participants: as we mentioned in our Methods chapter, we used the survey Question 3 response items near the end of our interview to probe for relationships between "My good or bad feelings…" and the other 8 criteria directly. The summary provided in Figure 11 below shows that the highest number of participants reported that "Quality of language," was as related to "My good or bad feelings…" which we also found in our co-occurrence analysis in Figure 10. "My previous experience" was 2nd, (3rd in Figure 10) and "Quality of images, sounds, videos/presentations" was 3rd (4th in Figure 10).

Figure 10: Top criteria co-occurring with "My good or bad feeling."

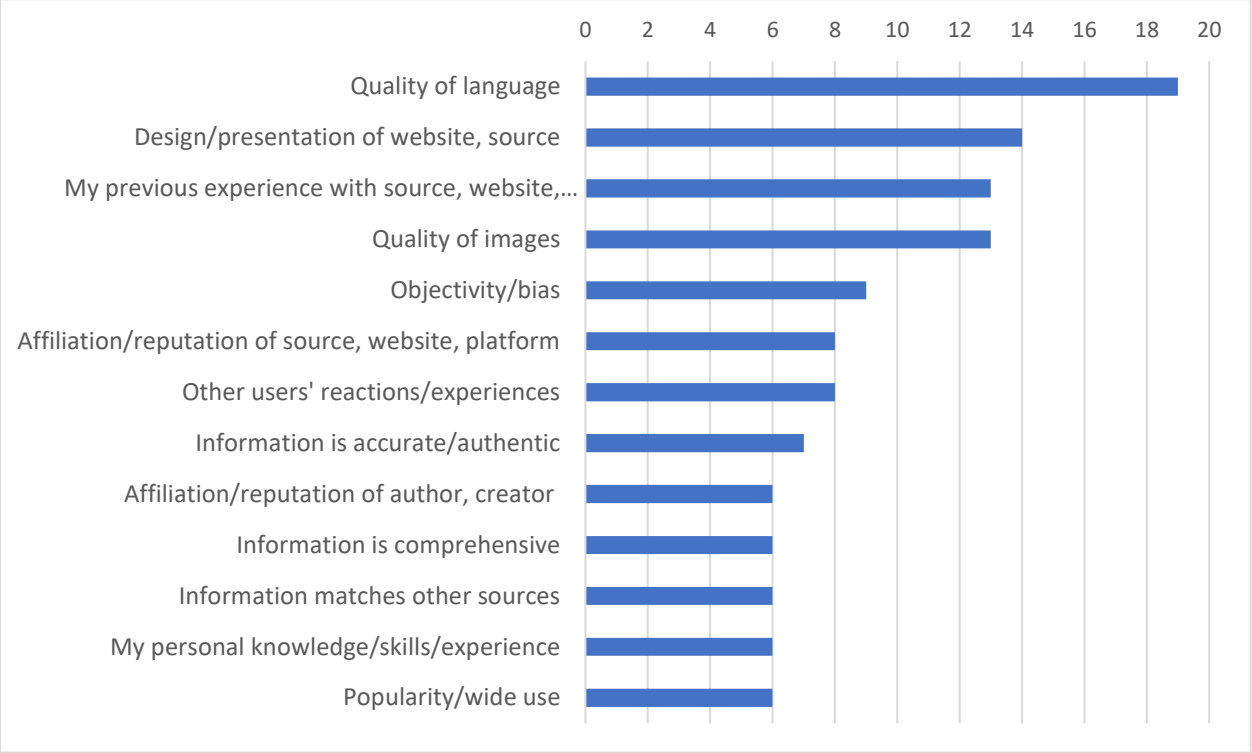
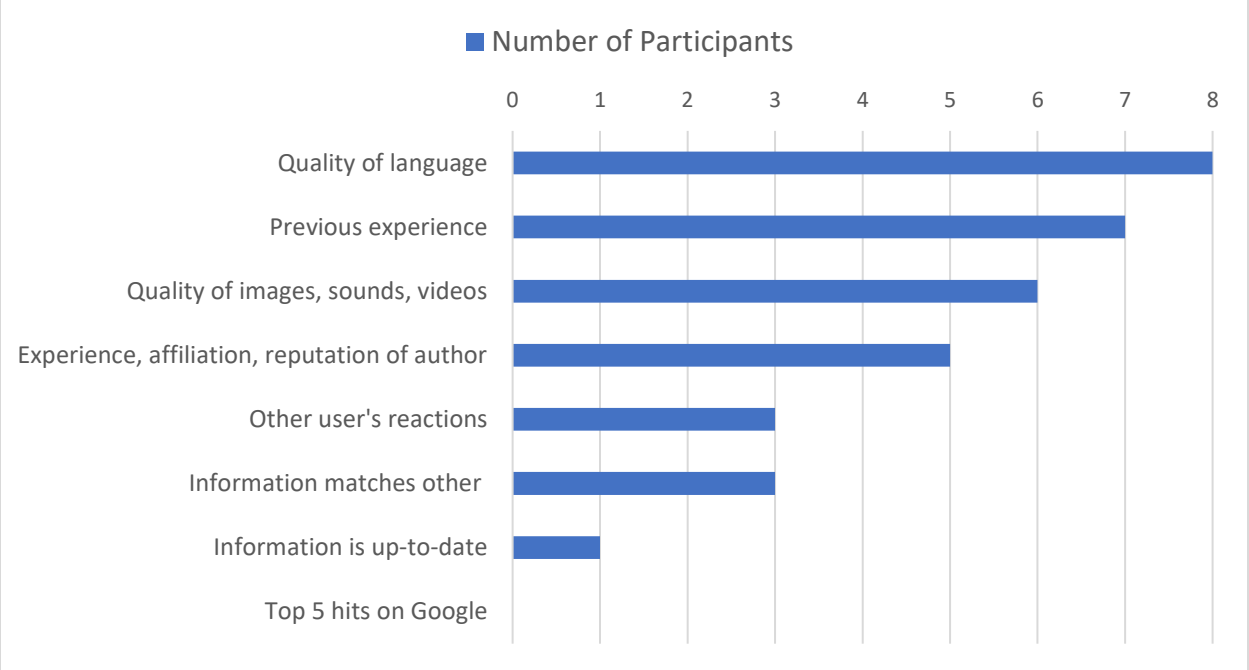


Figure 11: Summary of Responses to the interview question "Does the criterion 'My Good or Bad Feeling about a Website or Source' relate to the other criteria?"

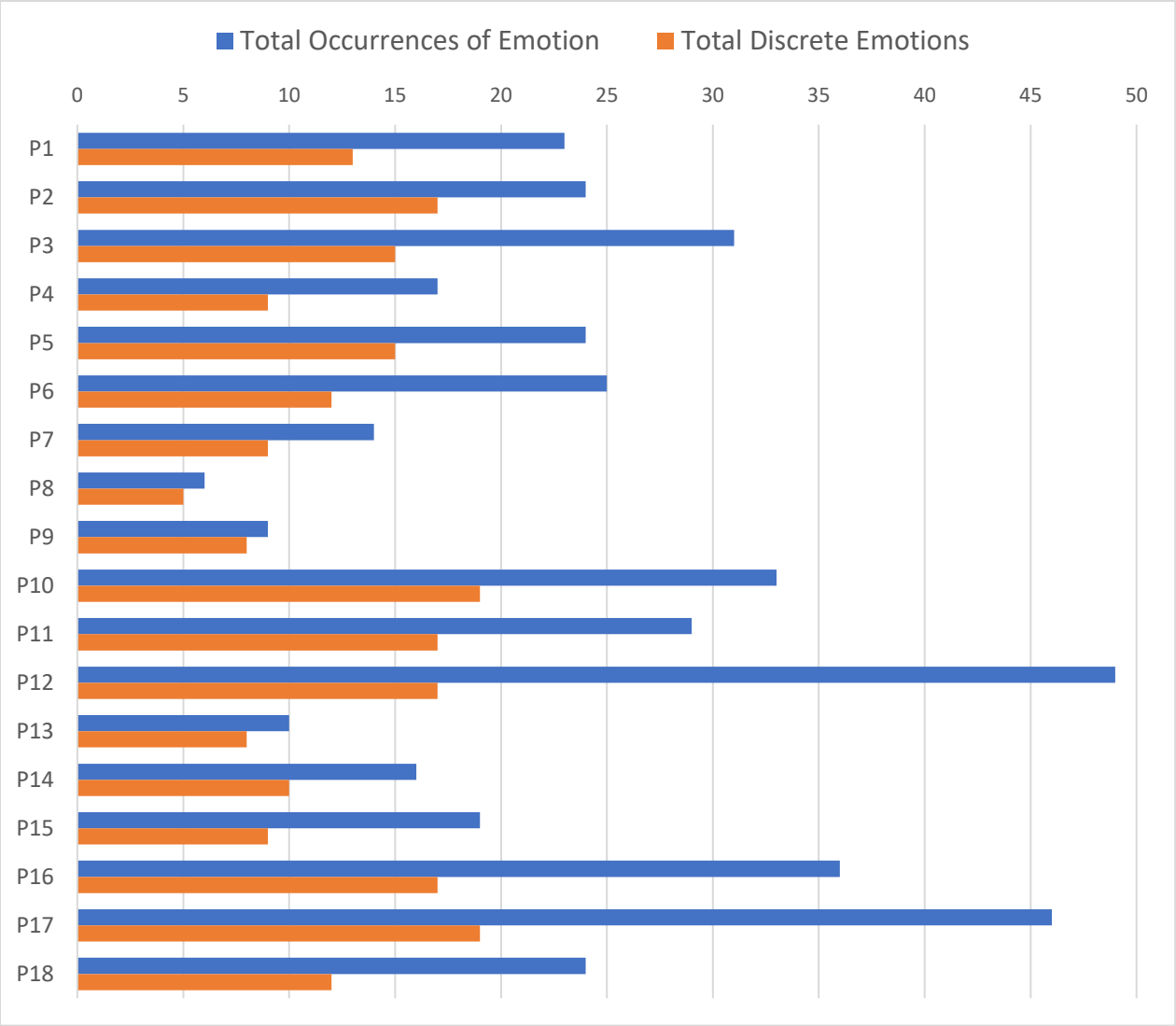


Whether a stronger co-occurrence between emotion and criteria means the information from emotions is more reliable or useful is difficult to say, however, we explore this further in our Discussion and Limitations chapter (5).

4.2.2 Emotion, Criteria, and Individual Differences

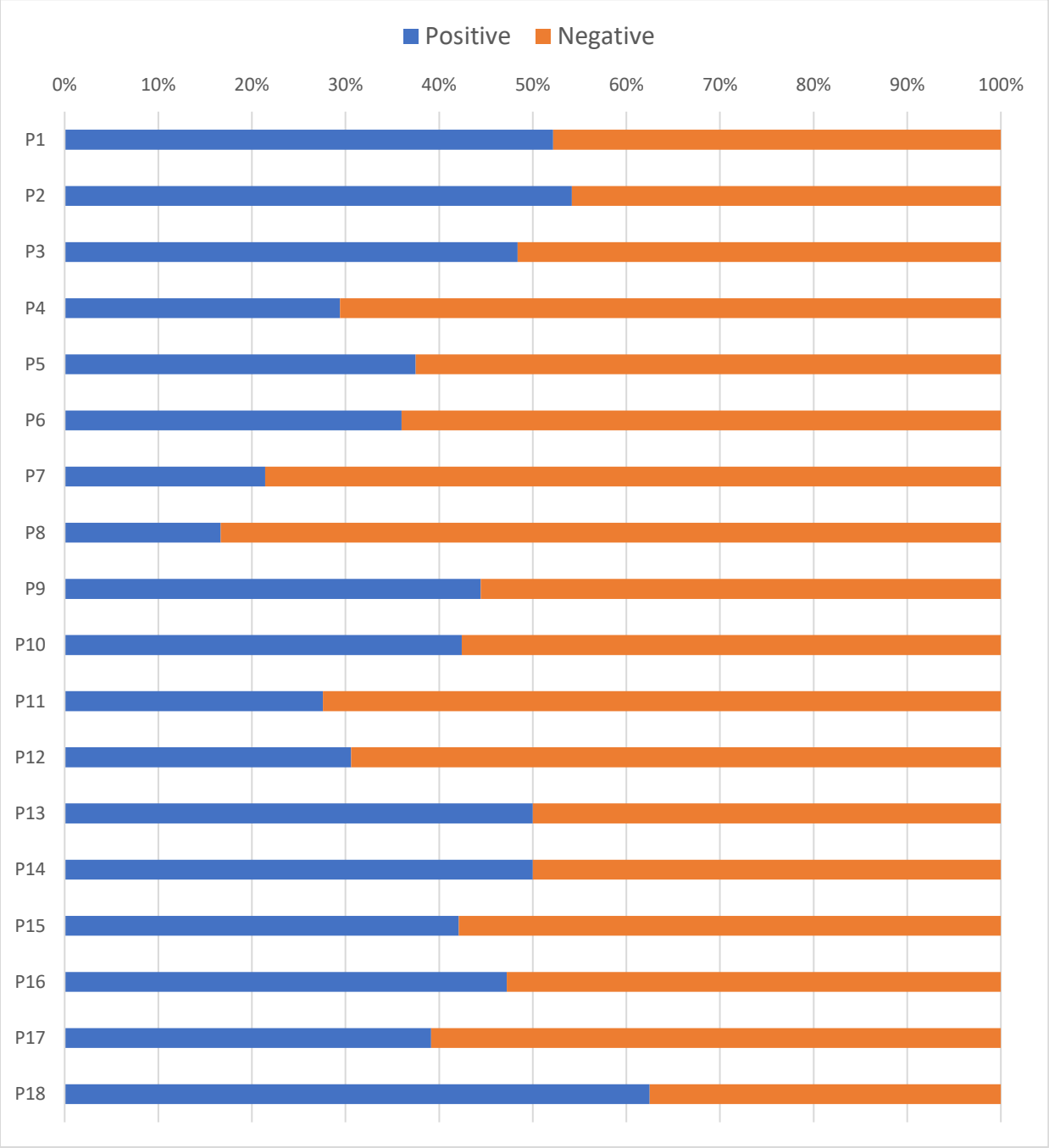
Although our sample size was low, we were able to see variation in the amount and type of emotional experiences among our participants. The numbers did not show any definitive patterns but helped to illustrate that individual differences are at play and should be explored in further research. Figure 12 shows the occurrence of emotions reported by each participant. Participants varied in how often emotions were mentioned during their interviews, with P8 having the lowest number of occurrences (n=6) and P12 having the most (n=49). Figure 12 also shows the number of different distinct emotions experienced by each participant, to show the range of emotional experiences; they are similarly varied among participants, with P8 again having the least (n=5) and P10 and P17 having the most (n=19). It is reasonable to assume that, given the structure of the interview, these findings indicate that some participants were more reticent to discuss their emotions than others. A personality inventory or inventory of emotional awareness would have possibly corroborated this finding and added another dimension to these individual differences. Future studies of individuals should include these.

Figure 12: Total occurrences and total no. of discrete emotions by participant



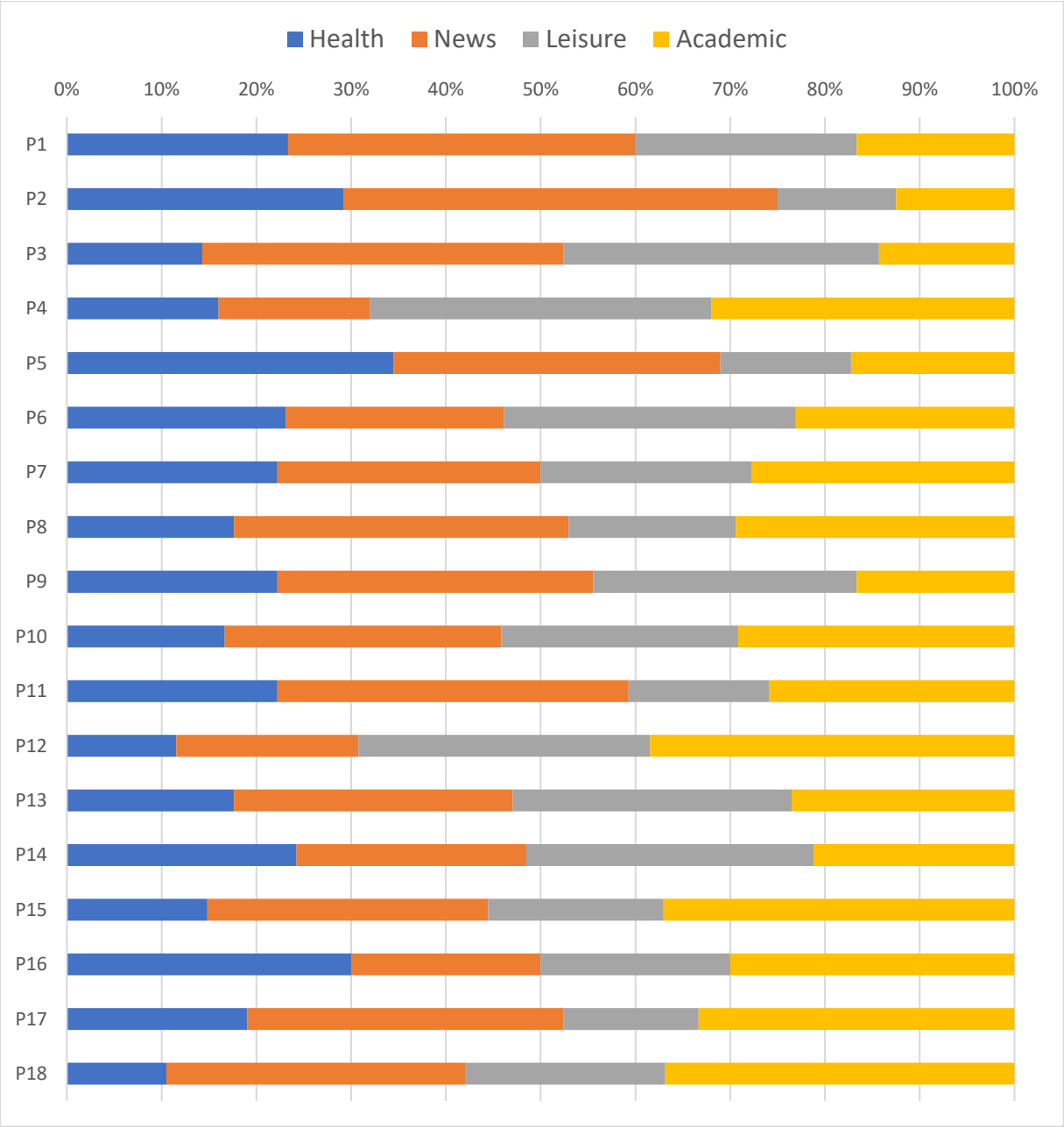
Our participants also varied by the valence of emotions they reported. While in general, more negative emotions were reported on the whole, there was quite a bit of variation among participants in terms of the ratio of positive and negative emotions reported. Figure 13 shows the ratio of positive and negative emotions by participant.

Figure 13: Ratio of negative and positive emotions by participant



Although the interviews were semi-structured, we noted in our Methods chapter that probing questions and topics were different among participants. When asked for narratives, participants were sometimes only able to remember or spend most of their time on one or two topics. The topics may have influenced which emotions dominated the conversation. Figure 14 shows the ratio of occurrence of the 4 topics for each participant. Considering our findings about emotional content of different context, it seems reasonable that those with larger time spent on leisure likely had positive emotions were likely occur, and those with time on more serious topics may experience more negative emotions.

Figure 14: Ratio of information topic by participant



For the rest of our analysis, we examine the dataset as a whole, looking across our participants at large for overarching patterns in responses and behaviours. Our finding that emotion has a relationship with the top criteria for judging credibility will helps us to see *that* emotion plays a key role in credibility judgements and makes the case for exploring further. In the next few subsections, we use lenses provided by Hilligoss and Rieh's Unifying Framework in order to

examine more closely *how* emotion may be influencing credibility judgements, and what other factors may be at play.

4.3 Themes Relating to Hilligoss and Rieh's Unifying Framework of Credibility

Hilligoss and Rieh's Unifying Framework of Credibility Assessment was selected as a theoretical lens through which to understand credibility judgement, while also helping to structure our design, as explained in our theoretical framework section. We chose this framework particularly for its focus on the user as central to credibility judgement, as well as its multidimensional conceptualization of credibility, and inclusion of context. The framework is used as a scaffold for exploring the role of emotion in credibility judgements, and as one of our research goals, we are looking to extend this framework to include emotion. For this reason, we also use the framework to structure our analysis and findings in the subsequent sections and subsections.

The framework divides credibility assessment into 3 levels: Interaction, Heuristics and Construct. The framework is nested in Context. It was evident from our findings that emotion operates in all levels of the framework, including context. We describe each level in the reverse order of Hilligoss and Rieh's article because our findings were more easily explained in the progression from the Interaction level, which focuses on more granular aspects of searching for information, to context, which concerns broader aspects of credibility.

Also, for the purposes of analysis, each level was treated as distinct from the others, but in reality, credibility checking processes were often iterative, involving all levels and influenced by context. Because the levels are iterative, our coding of 'criteria' originally did not differentiate between criteria that might be considered 'interactions' or 'heuristics,' since the line between these two levels was difficult to determine before our analysis. Criteria are treated as 'cues' at the Interactive level and 'heuristics' at the Heuristic level, based on our observations and analysis according to the definitions from Hilligoss and Rieh and related literature.

4.3.1 The Interaction Level and Emotion

The Interaction level of Hilligoss and Rieh's framework is characterized by interactions with particular information *cues*, and as such is not usually generalizable to all contexts. Hilligoss

and Rieh define cues as "specific attributes associated with particular information objects and sources for credibility judgments" (Hilligoss and Rieh, 2008, p. 1473). Cues were subcategorized into 'content cues,' 'peripheral source cues,' and 'peripheral information object cues'; Hilligoss and Rieh mention emotions ('affective responses') as part of the peripheral information object cues, explaining that some participants indicated having a feeling about the credibility of a source. They found that these feelings were associated only with peripheral information object cues, whereas we found evidence of emotions in all subcategories. In our results, emotions emerged as a cue in itself, either stand-alone or in relation to the other cues and are described heretofore in our study as 'emotional cues' as opposed to the other 'cognitive cues'. Emotional cues provided information that contributed to credibility judgements in all subcategories.

The three most important themes from our data that fit under Interaction level helped us to understand the role emotion plays in interaction with cues. *Emotional cue as informational* describes emotion as a cue having informational qualities in itself as well as in relation to cognitive cues. *Emotional cues as motivational* describes a role for emotion different from its informational one, that emerged with our theme of *credibility checking as process*: emotion as motivational (or demotivational) of the process to check credibility. Credibility checking as a process shows that, while each cue may play a distinct informative or motivational role in establishing credibility, cues do not by themselves necessarily lead to a credibility judgement.

4.3.1.1 Interaction Subcategories

The Interaction level is divided into 3 subcategories: Content Cues, Peripheral Source Cues, and Peripheral Information Object Cues. Using their definitions, we found that our criteria could fit into these subcategories without pre-establishing these in our research design; this corroborates the comprehensiveness of the subcategories, although not necessarily their distinctiveness since our criteria sometimes fit into more than one subcategory. Table 6 shows the top 10 criteria by occurrence with corresponding interaction type; Appendix 4 shows all 35 criteria and their corresponding interaction type. The following subsections show how these criteria acted as different types of cues, and discusses how emotional cues emerged under each subcategory, either by themselves in association with cognitive cues.

Table 6: Top 10 Criteria Ranked by Occurrences with Interaction Subcategory (See Appendix 4 for full list)

Rank	Criteria	Occurrences	No. of Participants Reporting	Interaction sub-category
1	Other users' reactions/experiences	100	18	peripheral source cue
2	Objectivity/bias	97	17	content cue
3	My good or bad feeling	96	18	All subcategories
4	Information matches other sources	88	18	content cue
5	Quality of language	71	17	peripheral information object cue content cue
6	My personal knowledge/skills/experience	70	17	content cue
7	My previous experience with source, website, platform	68	18	peripheral source cue
8	Information is accurate/authentic	54	17	content cue
9	Expertise/experience of author/creator	54	17	peripheral source cue
10	Quality of images	53	15	peripheral information object cue content cue

4.3.1.1.1 Interactions with Content Cues

Content cues are cues taken from the content of the information itself; they include matching content with the content of other sources as well as using the content of one's own knowledge. We found 19 criteria that fit into this subcategory (see Appendix 4). Our 2nd and 4th highest occurring criteria – Objectivity/bias and Information matches other sources – fell under this subcategory.

Participants reported emotions in association with content cues, such as excitement, irritation, skepticism, and fear. P6 explains that she feels irritated by content she believes is the opinion of one person being expressed as the opinion of the whole student body in the university newspaper:

> I'm half Israeli and people will write about Israeli-Palestine issues like it's some black-and-white thing, or they have some really strong view about it, and I don't have a strong view about it, but sometimes people write something that's really one-sided and that really irritates me. (P6)

Her feeling of irritation coincides with her observation that others' strong opinions are subjective and do not reflect her perspective. The participant expresses her irritation as a result of interacting with the content cue of bias; emotion is a part of the interaction, marking the cue as negative or having some kind of detracting quality.

In this case our participant found the content cue to be negative because it is one-sided and didn't reflect her opinion. This negative feeling suggests a valuation about that cue as bad or poor quality, but it is difficult to say if this amounts to a judgement about the content's credibility at this point. We found that interactions did not always lead to obvious judgements about crediblity. However, cue and associated emotion *might* have led to an overall judgement of non-credibility further on in the process. A negative interaction did not necessarily or always lead to judgement non-credibility in our findings, but could influence further credibility checking behaviour as we will see below.

4.3.1.1.2 Interactions with Peripheral Source Cues

Peripheral source cues are cues regarding the origin or nature of the source, author, or creator; they include author/creator affiliation with a recognizable brand or organization, the presence of sponsored content or one's previous experience with the source. We found 14 criteria that fit under this subcategory (see Appendix 4); our highest ranked criteria – other users' reactions/experiences – was in this subcategory.

Peripheral source cues were associated with various emotions, ranging from skepticism to relief. In this example, P12 describes the excitement he feels when he sees a post from a mathematician about whom he already knows: "…if it's a mathematician that, like, I know and respect, I'll get very excited about that and have like, a really good feeling about it." (P12). In this case, excitement is generated by the name of the mathematician (or handle on the forum)

because of past experience even before the participant reads the content of the information. Again, a spontaneous positive feeling of excitement may suggest that the participant expects credibility, or it may have only led to the participant continuing to check for other cues.

P10 consideres cues about a source's agenda that indicate whether the author is serious about their leisure advice or simply trying to make money. He comments that indications of trying to sell something will give him a negative feeling about the source:

> I don't find it nice. It doesn't sit well with me, because it's a two-pronged thing – on one point they're trying to make money out of it, and on the other they are trying to pose as someone who is volunteering their time to help other people find leisure. But that's not what they are doing. They are trying to make money at the same time. (P10)

The connection between emotional cue and peripheral source cue is explicit in the participant's explanation: he associates discomfort ("doesn't sit well") with the contradiction between the source's simultaneous helping and selling. Neither the emotional cue nor the agenda of the source necessarily led to a judgement of non-credibility about the information at this point, nor does P10 state that sponsorship is a red flag in all context (just leisure in this case). However, both the peripheral source cue and associated emotional cue provided important information about the source that may have factored into a subsequent judgement.

4.3.1.1.3 Interactions with Peripheral Information Object Cues

Peripheral information object cues describe the information object qualities external to the content. They include the design elements of the information, such as quality of images, sounds and videos as well as the looks or personality of presenter. Our findings showed 8 criteria that fit under this subcategory (see Appendix 4), including quality of language (which we also categorized as a content cue), quality of images, sounds, videos, and design/presentation.

Emotions in this subcategory included fear, suspicion, interest and disgust. P1 describes his interactions with photos on a website while looking for information for a trip to New York:

> Yeah, because I saw some nice pictures, I was like, "wow, this place actually has nice places, venues to visit when you are there," so. Just looking at pictures itself, it looked very interesting and beautiful, so far, really much interested (P1).

We can see that P1 feel interest and excitement about the source but is reacting viscerally to the quality of the pictures; it is hard to say if any judgements about the credibility of the information in the pictures is happening, or if this is a rule he would use in other contexts beyond trip planning.

It was common for participants to report emotional reactions to design elements. In fact, Hilligoss and Rieh included emotion under the Peripheral Information Object Cue subcategory but only here and only with respect to their participants' reaction to aesthetic qualities of the information object, such as the look of the website. While we also found that participants related their emotional reactions to aesthetic qualities, we found evidence of emotion having influence on the other categories and subcategories of the framework, as we have shown above. We can also see that emotions are providing some kind of information in terms of the value of each cue, which may or may not be leading toward a credibility judgement.

4.3.1.2 Emotional Cue as Informational

We found that emotion at the Interaction level was associated with cues in every subcategory. Our analysis looked at the relationship between emotion and cognitive cues in order to help us better understand what kind of information emotions contribute to the credibility checking process. We used the concept of *integral emotions* (emotions that are part of or *integral* to the object or event at hand) (Lerner et al., 2015) and *feeling-as-information* (Schwartz, 2012) as defined in our Theoretical Framework section (2.2) in our analysis to show that emotions were *relevant* to the cue, that is, providing information about the cue that could be used to make a credibility judgement. We found that this information was unique, in the sense that it *added informational value* to the cue. At the most fundamental, the informational value was based on the valence of the emotion.

Positive or negative emotions associated with cues seem to give information beyond what the cue itself says. Emotion associated with a cue appeared to give information about the *quality*

of the cue based on valence; positive emotions marked cues as good quality while negative ones marked them as poor quality; this in turn can contribute information about the overall credibility. Participants reported that a poor choice of a design element, such as colour or image quality gave them a negative feeling, such as disgust: "I just kind of look at it…it's…there's some not good looking websites out there I have to say, so I just…and then I leave. But if I were to put into a feeling it would just be almost like 'ew gross' (laughs) and then that's it" (P5). We can see the result of this feeling is to leave the website without checking any other cues; we still cannot say for sure if a judgement of non-credibility was rendered here.

The valence of an emotional cue also gives information about the success of the process. P1 gets a positive feeling (feeling great) from matching information with another source and gets a negative feeling (disappointed) when he cannot find a match to verify his source: "Yeah, obviously when I have verified the information, I'd feel great. I'd be like "wow, that's great" but if I haven't found any other information that confirms it, I would just disregard it in that case…I would feel very disappointed" (P1).

In the above example, P1 indicates that a positive feeling would tell him he was *successful* in confirming matching information; a negative feeling would accompany his *lack of success in* finding matching information.

We also found that emotion could act independently as a cue by itself without being associated with any other cue. P12 reports that he sometimes has a feeling about a source with no other input:

> **Investigator**: Does this [emotion] have a relationship with any of the other things? Or is it stand alone?
>
> **P12**: No, I think uhm, sometimes I'll just get a bad feeling for no reason. (P12)

By 'no reason' we understood our participant meant 'not in relation to a cognitive cue'. It is difficult to know if this 'bad feeling' led to his subsequent judgement of non-credibility, or if he just left the source without checking any other cues.

Some participants also indicated that they would not usually rely on their emotions for credibility judgements, showing some skepticism toward the informational value of emotion, at least in absence of other cues: "I *feel* like something is really credible but I don't see any sources I know…and even if I feel good about it, I can't just accept that as fact" (P9).

For some participants, emotions were generally less prevalent, occuring only in response to certain situations. P15 states that she only notices emotions when they are negative, flagging possible issues with information: "I don't necessarily have a good or bad feeling every single time, it will probably be more neutral, so I don't lean on that too heavily – but if there's a bunch of red flags and it's glaringly 'don't get your information from here!' then I'll say 'Ok, open that, 5 seconds, bad vibes, close it'" (P15). Interestingly, P15 also had a relatively low number of emotional occurrence in her data, ranking 12 out of 18, although not a very high ratio of negative to positive (Figures 12 & 13). Others expressed that while they had both positive and negative emotions, they tended to pay more attention to the negative ones: "getting a good feeling about it I'd say is a plus, if I get a bad feeling, like, that's makes it a little more clear to me that this is suspect" (P12). This corroborates our finding that negative emotions were more commonly associated with credibility judgements in general.

We noted in our subsection on criteria and emotion that the prevalence of skepticism/doubt may indicate that certain emotions are inherently more relevant to the construct of credibility: "…it's wordpress, that's immediately there's like a doubt, right?" (P4). When P4 notices the platform, she immediately feels 'doubt,' which provides specific negative information about the cue; further on, she reported that she continued to check rather than make a judgement at this point; We explore the relevance of emotional information more in our subsection on Context (4.3.6).

In our study, we focused mostly on the valence dimension of emotion, and the information it provides about quality or success. However, other dimensional attributes, such as certainty, control, or arousal, also provide information (Roseman et al, 1990; Scherer, 2005; Lerner et al, 2015). For example, sadness and anger tell users that the cue in question is poor quality, but

also that the cue may indicate their level of power or control over the issue. P10 expressed sadness when he encountered 'fake news' or misinformation:

> …it's sad that I know that - I'm not sure if it's 100% fake news or not - but when I go on those websites I already know that there are people who could be taking this a real information and it's impacting their life. (P10)

In contrast, P11 felt anger in similar situations:

> I see that now, especially with the fake news that you see floating around the internet, it just makes me really angry. They are misinformed people spreading it around so much…that means more people are believing it, when really all it would take is one or two quick Google searches to clarify everything that the article or image has wrong. I'm disappointed that people aren't putting in the effort to checking where the information is coming from and are just upset. And I agree that people are just spreading it around. (P11)

Both sadness and anger are negative valence, but while P10's sadness shows a lack of agency on the part of themselves or others to do anything about it (low power/control), P11's anger and disappointment shows a strong sense that people can fix the problem if they wanted to (high power/control) (Roseman et al., 1990; Scherer, 2005). We address this type of analysis further in our Discussion, although analysing by other appraisal dimensions is beyond the scope of this study.

4.3.1.2.1 Interaction with cues do not necessarily lead to credibility judgements

We noted above that while Hilligoss and Rieh's seem to suggest that interactions with cues amounted to judgments about credibility, we did not always find evidence of this. This distinction may have to do with Hilligoss and Rieh's use of 'judgement' and 'assessment,' where the former referred to smaller, additive judgements, and the latter a summative overall assessment of credibility. In forming our theoretical framework, integrating emotion theory with credibility theory, we found it useful to think of credibility judgements in terms of *decisions* about credibility; in our view, judgements and assessments are both a kind of decision about credibility, whereas what we observed regarding interactions with cues were *reactions*.

We did find that there was a valuing role for emotion in the interactions with cues, which seemed to provide information about the quality of the information or success of the checking process, but whether these interactions by themselves can be considered judgements of credibility was difficult to say.

This finding leads to an important distinction between the interaction level and the heuristic level in the observation: interactions do not always lead to judgements about credibility. This distinction was consistent with Hilligoss and Rieh's and other credibility researchers' definitions of heuristics as quicker, easier ways of making credibility judgements (Hilligoss and Rieh, 2008; Sundar, 2008, Metzger et al., 2010); in these cases, judgements about credibility were clearer, using rules or rationales. We discuss this further in the Heuristics subsection.

Cues are not themselves directly associated with credibility judgements but are part of the iterative process that can lead to a credibility judgment; they can also lead to other outcomes, as we show in our analysis thus far, with several of our participants reporting that they stopped checking or navigated away from a source without having necessarily made an explicit judgement about its credibility. Immediate or initial reactions were usually in response to peripheral information object cues; depending on the site, they could be design elements, a heavy presence of advertising (pop-ups), or the quality of language. Participants often reported leaving a source because of their initial reaction to design elements or presence of advertisements; this was usually accompanied by a corresponding emotional cue, such as disgust or irritation. P5 describes his feelings as immediate in his reaction to design elements of a source, preempting his judgement based on any other cue: "Yeah, so that would just come to pure presentation. Come to the website and you are just like "wow you are purple everywhere – I have to leave" (P5). In these cases, leaving a source was not necessarily the result of an explicit or final credibility judgement about the information or source; he did not express that he had found the site to be non-credible, but hardly began the process of judgement. P14 also admits to leaving a source without checking any other aspects of the information: "Well, if I have a bad feeling about the website, I wouldn't use it, like those who are…seems artificial right from the start – that bad feeling, I wouldn't go to it, or continue reading it" (P14). By

mentioning he might have continued reading otherwise, there is a suggestion that a proper credibility judgement has not been rendered.

P11 is even more explicit about her reaction to presenters she finds annoying; she would not even begin to consider the credibility of a recipe presented by someone whom she found unappealing to watch:

> Sometimes their personality can bother me, regardless of how credible they are. If I think they are annoying, I probably won't watch their video. Like, if they have a strange voice or if they have an arrogant attitude, I usually …in that case I would probably read the recipe, I probably wouldn't watch it. (P11)

This was not a judgement of credibility, but a response to a design cue based on taste; according to Hilligoss and Rieh's framework a judgement about the credibility requires an association with a *construct* of credibility, such as truthfulness or believability. In these cases, the participant was not necessarily connecting their distaste for the design features and any idea or construct of crediblity, and in fact, P14 explicitly states that crediblity did not factor at all. However, their reactions do influence their choice *not to continue* watching, reading, or otherwise continuing to check further cues. We felt that this distinction between interacting with cues rather than using heuristics help us to understand when criteria were in fact *heuristic* as opposed to *interactions*. This is not to say that judgements were not formed at the interaction level, but that judgements formed at the interactive level were a more systematic process, as we discuss in the next subsection.

4.3.1.3 Credibility Checking as a Process

Interactions with particular cues are understood as distinct, but related actions in a credibility checking *process*, which could include checking a single cue or multiple cues. We showed that initial reactions to superficial cues often did not result in a full credibility judgement but did influence the subsequent credibility checking behaviours. Credibility judgements in the sense of deciding on the 'truthfulness' or 'believability' or one of the other constructs of credibility often occurred after checking multiple cues and associated emotional cues.

Credibility checking as a process is not so far off the more traditional 'checklist model' of information evaluation of IL standards (e.g. ACRL, 2000; Bent and Stubbings, 2011). Our participants *did* report this kind of checklist approach when defining a perfect source, or 'dream source,' as P2 describes:

> I'm, like, happy that I have a really good source to go by, cause it's, like, you have an author, you have a really nice website page – it's like my dream source – you have a nice website page, for like, let's say work, especially, when I like have to cite this source, and it looks really legit, like people say you should really should use this website, some people say that, and then it has all this information, that you are looking for, it has a lot of it, it's very descriptive. That makes me feel super accomplished. (P2)

Here P2 is speaking hypothetically about what kind of cues (the author, good design, references, other's reactions, comprehenisveness) as well as associated positive emotional cues (happiness, accomplishment) she would experience from the 'perfect' source; she is also showing all the 'perfect' checking behaviours that one would expect.

P2 goes on to describe a disappointing experience finding a non-credible source, but still listing the right behaviours and corresponding cues that help her along the path to the 'correct' judgement:

> But then sometimes you'll read the title page of another one, and this is mostly in the case of school, I guess, you'll read it and thinking this is exactly what I'm looking for – you click on it, and it's like one paragraph on a blank page, no author, and the website is something you've never seen before, and it's just like, I can't use this. You just know that you just can't use this – I guess you can say you are upset that you can't use it. Something that you wanted to in the first place. Especially when you are looking for something and you can't find any actual citable sources, I find it really irritating. (P2)

P2's negative emotional cues (angry, irritated) correspond with a lack of useful cues, or cues that show poor source quality (no author, no references, plain design, no previous experience with the source, short content). P2's descriptions of credible and non-credible sources are ideal,

where cues register corresponding emotional cues that provide relevant information about whether the cues are of good quality or not, and point to a possible construct of credibility about the source as a 'dream source.',. However, the crediblity checking process is not always so straightforward.

In his example, P5 uses the 'information matches other sources' cue multiple times, each time associated with an emotional cue of skepticism or confusion, leading to an inability to make a credibility judgement when he is unable to find cohesion among the sources:

> …you have someone on Twitter saying, "this is outrageous, I just witnessed so-and-so happen on the bus." And then you go on CNN and that's blown out of proportion, and then you go somewhere else, and the numbers don't match up and you are just confused, 'cause who do I believe? (P5)

First skepticism and then confusion tells him that something is not right with the information he is looking at; no other types of cues are used, and P5 cannot make a final judgement on whether the information is credible or not.

In some cases, the emotional cues were not always considered helpful when interacting with cues; participants were leery of the information emotional cues may be providing, sometimes interrupting the credibility checking process. P15 actively notices her emotions while interacting with sources, and tries to disregard them, regardless of whether the emotions are telling her something is useful or not (we noted above that P15 has a relatively low reporting of emotional occurrences):

> …because with sources, I'm so much more about facts, and I do go into it, like, "I want facts! Not feelings!" I kind of catch myself sometimes going, "ok, you are having a feeling, but that doesn't mean that it's a credible judgment on the credibility of this other thing." Then I might step back and say, "Ok, feeling- ignore this, continue with the research." (P15)

P15 sees her emotions as contradicting the information of the other cues or 'facts.' We will see in later subsections that emotions were reported to have inhibited the ability to perceive cues, as well as encouraged hasty judgements. But this assumption may also be based on a cultural bias against the informational value of emotion. Without really understanding what information P15's emotions were trying to give her, we cannot know if these emotions were hindering or perhaps helping her process of judging of credibility.

We can see in the above examples how complex the layers of emotional cues and cognitive cues become during the process of crediblity checking at the Interaction level, and that credibility judgements at this level require time and cognitive effort. We have also seen that emotions can both support or block the credibility checking process, particularly at the peripheral information object cue level, where more superficial and visual elements are noticed first. After understanding crebility as a process, the *motivating* (or demotivating) aspects of emotional cues emerge as an important role in the credibility checking process, as they tend to influence whether the participants continued to look for more cues.

4.3.1.4 Emotional cues as motivational

In the previous subsection, we saw that emotional cues associated with cognitive cues – particularly peripheral information object cues – could result in leaving a source without a definitive judgement of credibility. We also found that emotional cues could motivate a desire to continue checking a source for credibility. P1 reports that a feeling of surprise, or incredulity about something would spark his need to go deeper into a source: "I would be, like, 'WHAT? Where did you get that?' That's when I start questioning the source and everything. Is it really reliable, is it really credible? That's when I question it" (P1).

Some emotions were fairly explicitly motivating or demotivating. Curiosity or interest was nearly always a motivator of continuing the credibility process:

> Yeah, if it's something really really interesting…if it were something really really interesting I would want to figure out what is that thing about it, yeah, that's when I'd like…even if it was a really ridiculous claim I'd just want to see how they back up what

> they are saying, like the arguments they present and all that other stuff, would still be interesting. (P1)

Emotions associated with the need to check for more information were often complex; sometimes negative feelings were associated with more credibility checking and positive feelings with less. P2 reported that her feelings of excitement influenced her lack of checking credibility of a story about a celebrity: "I wasn't completely sure, I still shared it, but I was, 'I don't know if this is real or not but here it is.' It was just so exciting. Definitely that was an emotional thing" (P2). P2's excitement compelled her to share the story before properly checking its credibility. In contrast, P17 reports that feelings of a very negative nature accompanied feelings of curiosity to investigate further into a story about sexual assault:

> Yeah, definitely anger, disgust…sadness for sure. Sympathy…and just curiosity to see what the exact details are because…I don't know the more you go into it, the more you find out, and the more you want to find out about that…you funnel into it. (P17)

The same emotion did not always elicit the same motivation, either. P1 expresses that his feelings of anxiety inhibited his desire to check the credibility of information he needed for an assignment that was due soon:

> Yeah, that anxiety actually made me, like, the amount of credibility, like, I'd disregard credibility somehow, or I wouldn't give it much importance in that case, if it's an assignment which I need to really finish I'd just take off anything that looks even the smallest bit of credibility. (P1)

In contrast, P17 uses her *anitipation* of anxiety to motivate a very thorough checking of the information before she chooses a restaurant:

> I have Generalized AD disorder [Generalized Anxiety Disorder], I just like to have everything planned out and prepared in advance. Because it just, like, reduces all uncertainty in my life. Like, I'm the type of person that…I check the menu, I know what I will order before I go to the restaurant, so I don't have to look at the menu and be, like,

> "uhh," like, be overwhelmed by all the choices. So, I think, like, planning and finding out everything beforehand is just something I've adapted to do, because if I just go into a new situation and then I don't know what's happening, chances are I'm going to feel very uncomfortable and not have a good time. So, it's just like having…it's just having a safety blanket, but with me at all times. (P17)

P17's situation differed from P1 in several ways, not the least of which is her anxiety being the product of her GAD. P17 is describing a strategy that she uses to *cope* with her anxiety, which she has worked on over time in response to a medical need. This unique situation introduces some of the findings from our analysis under The Heuristic section (4.2.5), the development of rules and strategies that will help to circumvent the work - both emotional and cognitive - at the Interaction level. The motivational aspect of emotion in credibility checking is also further explored in the subsection on Context and Emotion (4.2.10), which describes the influence of situational factors on emotion in credibility, and the distinction between integral and incidental emotions.

4.3.1.4.1 Credibility Checking as Subconscious

Participants sometimes could tell us about the process of checking multiple cues, including emotional cues, but reported that during their actual activities, the process was mostly subconscious:

> I'm not aware that I'm doing these things until maybe afterwards when it's being questioned, like right now I realise, cause when we were talking, it's only until you kind of probe for it that I brought up the idea of, you know, visuals. And that's something that I always do, but I've never actually specifically said that I'm doing it. So that's what I mean by subconscious, so yeah. (P5)

P5 can explain the checking process that resulted in his judgement, but only when probed or in reflection; this was true for many participants, particularly with respect to any emotional cues that were reported as part of the process. This explains why interpreting the information from

cues for our participants was difficult, and required some self-awareness and metacognitive skills.

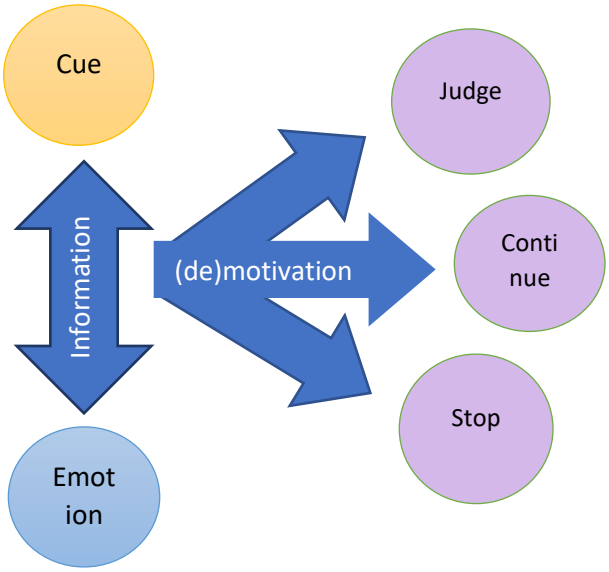
Emotions were often reported as occurring 'in the background' or subconsciously by our participants, and therefore it was sometimes difficult for them to determine how emotion factored into their credibility decisions without a lot of reflection and probing. P10 was able to confirm that emotion was a factor, but not exactly how: "My good or bad feeling…I don't know if – it's definitely a factor, but I'm not really conscious of how I'm feeling when I'm reading a website." (P10)

When asked if she noticed whether her emotions or the cognitive criteria came first, P4 replies that she didn't really know, since the process of checking credibility was largely unconscious for her: "I think these are all things I'm considering at the same time. It's not something…like, I don't have a checklist, it's like things that are running in the background." (P4). Her mention of 'a checklist' is reminiscent of the perfect credibility behaviour we saw above. Under the lens of our theoretical framework, we can discern where emotions may be influencing interactions with cues and influencing the credibility judgement process, but in reality, it is more often an enigmatic process, partially to totally obscured in the subconscious.

4.3.2 The Interaction Level and Emotion - Summary

Participants' interaction with cues appeared to be an information collecting process; information from cues of all types, including emotional cues, is noted and built upon through a checking processes (which is sometimes supported, interrupted, or motivated by emotional cues). These interactions were not necessarily associated with judgements about credibility by themselves, but were collected, either consciously or subconsciously, toward making a judgement. The role of emotion in this process is informational *and* motivational, telling participants about the nature of the cues, the successes (or failures) of the interactions, and whether or not to proceed in checking credibility.

Figure 15: Interaction level: Emotions provides information about cues and motivation for judging credibility.

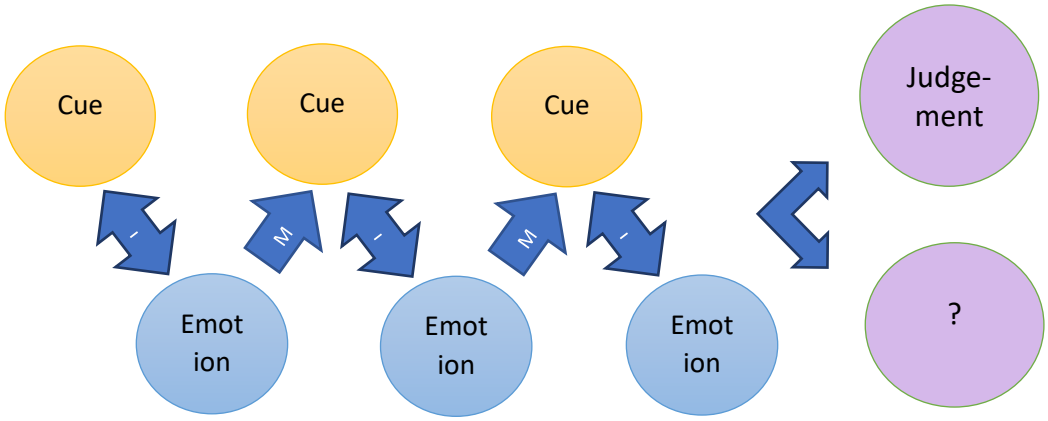


Another way of looking at the Interaction level is about the *experience* of checking and judging credibility. P17 explains her interactions with numerous cues as her "experiencing" a news story about a sexual abuse trial:

> I was following while it was happening, like, while the trials were happening. So, it was like, "What is happening? Is he going to jail, is he just going to get a fine? What is happening?" So just like following it through was really reliving, it was a lot – it was like, you were really angry and as you know that he was pleading guilty, he is being sent to jail, he's guilty…all that is very relieving…you are kind of experiencing the news at the same time. (P17)

Experiencing credibility involved *thinking and feeling* one's way through the process of judging credibility. Figure 15 shows the informative (i) and motivational (m) aspect of emotional cues in the credibility checking process.

Figure 16: Interaction Process: Multiple cues leading to credibility judgement, or no judgement.



From the perspective of interaction, the credibility checking process was arduous, unpredictable and somewhat volitile. We have seen that interaction with cues, including emotional cues, resulted in multiple outcomes, such as continuing to check for cues, leaving a site, or stopping the search entirely in confusion (Figure 16). We have also seen that there is no obvious consistency as to whether emotional cues will motivate or demotivate checking, although there were certain emotions that were more directly associated with motivation, such as interest, curiousity, and even anger. Added to this, we have seen that the process of checking credibility can be largely subconscious, making the nuances difficult to detect, and the information from both cognitive and emotional cues difficult to interpret. Our next subsection looks at results at the Heuristic level, which introduces rules and strategies that address some of the difficulties of interacting with information.

4.3.3 The Heuristic Level and Emotion

Heuristics, according to Hilligoss and Rieh, provide "useful ways of finding information conveniently and making credibility judgment quickly." (Hilligoss and Rieh, 2008, p. 1473). Heuristic subcategories are similar to cue subcategories, in that they relate to different aspects of a source or information object. Hilligoss and Rieh found four subcategories of heuristics: 1. 'Media-related heuristics', relate to knowledge about the credibility of a type of media; 2. 'Source-related heuristics,' relate to a source's familiarity or whether or not a source is primary or secondary; 3. 'Endorsement-based heuristics' relate to the reputation or affiliations of a

source; and 4. 'Aesthetic-based heuristics' relate to the design or presentation of a source. Just as content cues were considered more rigorous than peripheral information object cues (Hilligoss and Rieh, 2008; Sundar, 2008), heuristic types appeared to have varying levels of rigor. For example, heuristics based on reputation – which depend on the reliability of a 3rd party - may be less rigorous than media-related heuristics, which depend on one's own experience and knowledge about how media is structured. Even within subcategories, however, there are levels of rigor, for instance, a user may judge all information from all social media platforms as non-credible based on very little knowledge or experience or based on their knowledge of how they function through multiple experiences. While we felt that Hilligoss and Rieh's heuristic subcategories were helpful, we also found them somewhat limited, for instance, there appear to be no heuristics that are content-related, although we saw no reason why content could not be heuristically processed, given their definition of heuristics; Sundar, whom they cite, also allows for content-based heuristics (Sundar, 2008). For this reason, rather than use Hilligoss and Rieh's subcategories exclusively, we focused on their definition of heuristics, to find heuristics wherever they emerged in the descriptions. When focusing on the role of emotion in heuristics, we noted a key role for emotion in creating, supporting and recalling heuristics. These were best illustrated in our themes based on the notion of *trust,* on which we elaborate further in our analysis.

4.3.3.1 Criteria as Heuristic Versus Criteria as Cue

To distinguish criteria as a heuristic rather than an interaction in our analysis, we combined two features from Hilligoss and Rieh's definition: 1. Heuristics are *generalized rules* that can apply in multiple contexts: "The heuristics level is comprised of general rules of thumb used to make decisions regarding credibility." (Hilligoss and Rieh, 2008, p. 1475); 2. Heuristics are shortcuts to credibility judgements: "The use of heuristics supports their [participants] objective of finding information quickly and conveniently. In many cases, heuristics allow individuals to almost instantly jump to a judgment of credibility without much substantial engagement with the information or source itself" (p. 1475). We observed that both the *efficiency* and *generalizability* of heuristics came from a relationship between criteria and credibility constructs, such as 'truthfulness,' 'reliability,' 'objectivity,' and 'trustworthiness,' made explicit

in our participants descriptions of credibility judgements. Descriptions also gave evidence of a key role for emotion in how heuristics are established and used.

At the Interaction level, the quality of images, sounds and videos and associated emotional cue can lead participants checking into more cues, or to leaving a source without having made a judgement about the credibility of the source, as in this example from P5: "…if I come in [to a website] and it's, like, a strong cyan blue colour and the text is all wrong, I leave" (P5). At the Heuristic level, the same criterion is more directly or explicitly linked to a construct of credibility such as trustworthiness or reliability through some kind of rationale or thought process. In the example below, P12 is talking about finding credible music-teaching videos:

> I just get frustrated with low quality, it looks like someone recorded on a flip-phone. It just feels amateurish, and it's, like, it doesn't instill confidence in someone, you know what I mean? You don't feel like, "oh this guy who shakily recorded this on a terrible camera – he's the guy who knows what he is doing, he knows how to teach you." (P12)

P12's rationalizes his judgement of non-credibility based on a connection between the quality of a video and the competency of the author as a teacher; it is clear that P12 does not *believe* this teacher knows what he is doing. The example also shows how emotion may be built into heuristics, encoded into the rule about poor quality videos as indications of non-credibility: P12's *frustration* with the poor quality of the video is part of the rationale, reinforcing it as a heuristic of non-credibility.

4.3.3.2 The Role of Emotion in Heuristics

We observed through the descriptions from our participants that emotions at the Heuristic level accompanied rules, serving to reinforce them, and sometimes acting as heuristics themselves (Figure 17). Emotions supported heuristics by providing consistent information that was quickly understood in various contexts, and not easily ignored. For example, P14 has a rule about news on social media, that it is not factual or truthful because of its hidden agenda to get more 'clicks':

P14: Well, the social media gives you a bad feeling about it, especially with news. It's like, they are trying to talk about news to get clicks on their websites, so they are going to exaggerate facts or change facts to make you click on it. I don't want to go on it.

Investigator: Ok, where – did you have an experience of that, or did you hear about it?

P14: Mostly heard about – I don't think I've experience it, because I don't go on it, so I'm not sure. But I always hear…they always modify what the news is saying. They always modify what's true. (P14)

His rule is supported by his rationale - that news sources on social media modify facts on to get clicks - and give him bad feeling. We can also see another heuristic in play: other's reaction. He expressly states that he does not have direct experience but trusts the opinions of others. The outcome is to disbelieve and even avoid news on social media as a rule.

Similar to emotional cues at the Interaction level, emotion appeared to act as a stand-alone heuristic, serving as a rule for making a judgement of credibility. P11 describes how her good feeling guides her judgement of credibility sources with little rationalization beyond the feeling itself:

> I tend to gravitate towards things that I have good feelings about, and usually it works out …my judgement is working pretty well, for me and my judgement of credibility. Yeah, I'd say that I think that having a good feeling about something, at least from my personal experience, is a good thing, and leads to credible information. (P11)

The understanding that emotion is a stand-alone heuristic points to a possible key role of emotion in the functionality of a heuristic in general. When asked if her feelings helped or hindered her credibility judgements, P2 explains that her feelings help her to remember final judgements from previous interaction processes with 'new' sources:

> I think your good or bad feelings, when they come from previous experience, they really help you with credibility and judgement and stuff…you can base your feelings off new sources, credible or un-credible sources, like, they give you a feeling for the next time

> you see it, you know yes, I click on it, or no I don't. Which I think is very interesting, I guess. (P2)

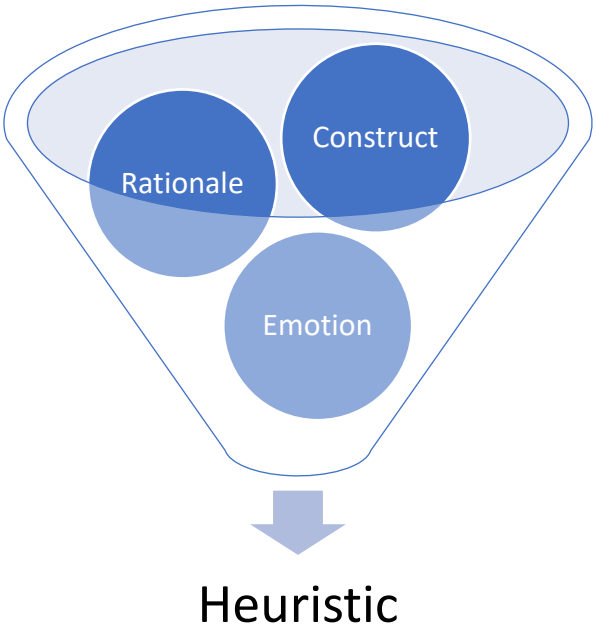
This 'remembering' role of emotion may be a critical piece in how heuristics are able to be recalled quickly for other situations. The speed and efficiency of this recall means that the users do not have to go through each step to get to the judgement of credibility (or non-credibility).

In addition to aiding recall, emotion also provided an easily recognizable marker of quality, which – when associated with a credibility construct, allows for quick and easy judgements of credibility. P6 associates Quality of language with either good or bad feelings, suggesting that the feeling may help to quickly determine if the information is reliable or credible:

> …depending on the quality of the language, that can either give you a good feeling, like something is reliable. Or a bad feeling. If the quality of language is not as good, that's definitely like, a bad feeling, and I think it's not as credible. (P6)

Negative or positive, emotion provided quick and easily interpreted information that directly links to credibility or a credibility construct (reliability).

Figure 17: Heuristic elements (construct, rationale, emotion)



Our themes of *Building Trust* and *Losing Trust* look at the way heuristics and associated feelings come together or fall apart; *Trust Building vs Myth Building* describes the different ways and levels of rigor by which trust heuristics are developed; *Types of trust* demonstrates a way to conceptualize and categorize heuristics based on the role of emotion ; and *Trust Bank* shows how trust can be an important strategy in mitigating difficult information contexts.

4.3.3.3 Trust as Heuristic

As we showed in our literature review, trust is not a well-defined concept in credibility, despite its clear relationship to one of the more common constructs, trustworthiness. As such, we did not include any trust theory in our analysis and instead used Hilligoss and Rieh's definition of Heuristic level, which fit our participants use of 'trust' in our data: we found trust to be a heuristic mentioned by participants to quickly and efficiently decide the credibility of a source, platform, or piece of information. Trust acted as a kind of 'pre-approval' of the credibility of information, and was usually attached to a particular source, author, or platform, but could also

relate to one's trust in oneself to quickly judge information. Trusted sources were 'go-to' sources or preferred sources that made finding credible information easy: "So, if it's consistently been credible, then it's again, it's like more of an ease-of thing, so how easy it is will – if I know I can trust this, then it will be my first stop" (P4). When we examined explanations of how participants built trust, used trusted sources, or lost trust, we found that trust fit both the generalizability and efficiency dimensions of heuristics, and included an emotional dimension, often explicitly. P11 explains why she trusts government websites for information about recreational drug use, showing a generalized rule that can be applied in multiple contexts (government websites try to keep Canadians safe), which is directly associated with credibility (trustworthiness) as well as a positive emotion (good feeling/safety):

> I do trust those government websites that aren't as fearmongering as some of the information in the states… I feel that they are trustworthy, and I feel that they are trying to keep Canadians safe. … I do get a good feeling about government websites that are trying to keep youth safe, and they do seem to have a harm reduction policy in the current situation. (P11)

We can see that a judgement of credibility is implied by 'trust,' based on the rationale that the Canadian government is not 'fearmongering,' seem to have a harm reduction policy, and want to keep Canadians safe. Her trust encodes all these things - rationale, credibility construct, and feeling - into a quick, easy, generalizable rule to find credible information about drugs.

Trust was a heuristic because it provided ease when searching for credible information, not only in the sense of saving time and energy, but also by aligning the correct emotion with a credibility judgement; a trusted source provides relief and comfort, and even happiness and excitement:

> I just thought that I found something really useful and that I had some new resources. And I was very excited. I'm a little bit excited now (laughs). Because I can find so many things like useful for me and I can find so many information, and also, I can post my information of my – of the house I want to…uhm…I want to rent on this group online. And it can be seen by many other students, and I trust the students in McGill university,

> so I think it can be – so I also feel comfortable, because I know it's safe. I feel guaranteed and protected by the university. (P3)

P3 aligns comfort, excitement, and safety with the McGill brand and its students into an overall trust of McGill-based information sources (in this case a McGill-based Facebook page). She could make quicker and easier decisions about renting a house without having to check into multiple cues. Similarly, an untrusted source created feelings of uneasiness and suspicion. As a counter example to the above example, P12 shows his lack of trust for student-run online forums affiliated with the school, aligning it with suspicion and skepticism:

> …people out here are out to get you for no reason…not everyone can be trusted just because you feel, like, they are my friend or whatever. There's some malicious intent out there, which is kind of unfortunate, cause it's, like, why did we come to a place to learn more just to try and sabotage people from doing? It's all so stupid everyone has such big ego. (P12)

In this case, P12 uses a rule of not trusting student-based information from McGill. Feelings of suspicion and skepticism are embedded in this rule to not use student-based information sources. While he experiences the negative feeling associated with the overall distrust, the feeling is definitive, accompanying the decision not to trust. His rule to not trust student-based forums means that he does not have to repeatedly work through checking multiple cues and associated negative feelings at the Interactive level. We saw in the Interaction level that checking credibility was often associated with confusion and contradiction among cues and emotions; using a trusted source means not having to experience inconsistent information, emotional or otherwise. Trust, like any heuristic, helped participants bypass the more arduous and time-consuming checking of cues. We also found that trust mitigated some of the less constructive or more volatile emotions that were associated with credibility checking at the Interaction level.

Going to a trusted source also mitigated some of the emotions created by the situation: participants used trusted sources when they were stressed about deadlines, fearful of others'

judgement, or worried about a health condition. We explore this further under the theme of Trust Bank, as well as the section on Context, where incidental emotions - emotions related to the situation and not the information object itself – are examined in more detail.

Our theme of building trust describes in more detail the process of connecting a rationale and a particular source, platform, or some quality with the credibility construct of 'trustworthiness' while simulaneously embedding a negative or positive emotion. Trust allows for quick and easy judgements of credibility or non-credibility. While observing trust building and use, we noted patterns to the type of rationale, source, or quality, that gave us 'types of trust,' categories that identified these patterns and differentiated themselves from each other.

4.3.3.4 Building Trust

Trust as heuristic were often presented in their rule form, as things that are generally true, but in some cases, participants could identify when they first found a trusted source and decided it was trustworthy. We identified this as *building trust*. Building trust resembled the description of a successful credibility checking process and shows the connection between the process at an interactive level, and the heuristic level. P16 relates her first experience with her trusted source on music:

> I think I was typing 'metal reviewer' and I think I found his name – he's an anthropologist and he is interested in this kind of music and what it brings to people – it's such a huge community of metalheads, as well call them, and he made a lot of documentaries on this genre. So yeah, I will find it more [a better] reference than another dude that has no background and didn't go around a talk to all those bands in general, like they say something "oh metal is about that" I don't know. Like this guy – Sam Dunn is his name – he's talked to a lot of people in this community – so if he says, it brings these kind of emotions into people to listen to this music, I would find this more credible. (P16)

When she first found this source, she checks various cues, including his expertise, previous experience, and other's reactions in the community, before deciding his information about music is credible. She goes on to describe a strong, positive emotional dimension to her

experience with this source: “I find it interesting, exciting, and also it makes me want to travel, all those festivals everywhere – makes me curious about other cultures and other people in general. And it makes me want to explore more the music” (P16). Presumably, these emotional cues are encoded with the other cues and together make a rule about this source as credible.

Our theme of ‘Building trust’ also includes building ‘distrust,’ which is the same process, but when the process results in a negative credibility judgement. In this example, P1 describes his encounter with sources he finds untrustworthy after checking them for bias and accuracy:

> …as I said for newspapers, if there’s a lot of bias, then, I disregard anything they say about a certain topic. If I know that it’s motivated by something else, then I’d just be like, I will never trust this newspaper again, but I’ll know that everything they post that’s probably – they have a motive behind it…first I try to give them the benefit of the doubt, as I usually do, then if I see that stuff is not making sense, then I investigate somehow, not really intensive investigation but like, if I check if what that thing makes sense, if it’s correct, I know that every time they post something in this subject in particular, I would disregard it. (P1)

P1 checks the source enough to feel comfortable making a rule about its untrustworthiness, aligning with feelings of doubt, allowing him to quickly disregard any information from it as non-credible going forward. Although the result is to not trust, and involves negative emotions, this is not the same as losing trust, which we examine in a later subsection. Building trust is also related to the theme of “Trust Bank”, also examined in a subsequent subsection.

4.3.3.5 Trust Building versus Myth Building

We found that trust was usually built up from some basis or rationale in association with good feelings (in the case of trust) or bad feelings (in the case of distrust). We also found that trust could emerge from detailed and rigorous to superficial and unverified rationales. From this distinction, we established two concepts for building trust in heuristics: trust-building and myth-building. Trust-building at its most rigorous was based on one or more previous credibility checking processes at the Interaction level. In this example, P3 gives an extensive

rationale for her trusting a McGill Facebook group that involves various cues, which add up to an understanding of how the platform and community works:

> Yeah, they show me pictures and I know they do have this, and they are not a liar. And we meet in the campus, so I'm safe, because there are so many students around. So I trust them. And because the people who entered the group should be, like, should be admitted by the leader of the group. And the leader will see their information, where they come from, and whether they are student of McGill university and something like that. And because I pay after I get the book. (P3)

P3 summarizes multiple cues about McGill student groups into an easily leveraged rule: McGill-based sources are trustworthy. Earlier in the interview, P3 described an incident with another platform where she was cheated badly. We can see here that an extensive rationale with multiple criteria - including emotional ones, like feeling safe - was needed to mitigate her fear of buying online as part of her re-building trust in a selling platform.

Not every rationale emerged from interactions with multiple *different* cues; some used the same cues repeatedly until they felt they no longer had to check this cue. Here, P5 talks about the process by which he found and learned to trust a news source, first verifying the source by matching with multiple other sources before deciding he could trust it:

> I didn't start watching his content just for news…it was just for like, he is kind of entertaining so I want to watch it, but eventually I started watching it for news – so when he was talking about news a lot, I would go and check it just to make sure. And then like after doing that a couple of times, I decided, like, I could trust him and then that way just go off of his stuff. (P5)

P5's rationale only used one type of cue, arguably this is one of the more robust cues (information matches other sources), which he uses multiple times before deciding to trust the source. Whether he continues to use this source unchallenged from this point on is an important question in how long heuristics endure unchallenged once they are established.

What characterized myth-building, on the other hand, was adopting superficial or unchallenged assumptions. The term *adopting* is used in contrast to *learning* or *experiencing;* rationales from myth-building are based on little or no credibility checking at the Interactive level but are adopted vicariously through hearsay or very little previous interaction with a source or platform. P14 builds his trust in La Presse based soley on its reputation, and not from checking cues, such as author credentials:

> For news I don't really know their credentials – like I don't know how it works, I don't know if someone can have a PhD in journalism. I just know that La Presse – I don't know how I got it, but I just know that La Presse is a really trusted website, so I trust the information in the website. Like without really looking at the people. (P14)

P14 admits that he does not have much knowledge about journalism, or how to check the credibility of a particular journalist, but feels that he can trust the source all the same based on the endorsement of others. If his trust was based on an understanding of how journalism worked vis-à-vis author credentials, he could be said to have a more rigorous media-based trust.

The theme of myth-building helps distinguish heuristics that are based on minimal checking of superficial cues such as design elements or popularity from more rigorous ones. It is sometimes difficult to distinguish between rigorous and superficial heuristics, particularly when the processes behind them are largely subconscious. P10 states confidently that he will trust a source, "As long as they came from a university website, then to me that's automatically credible" (P10). This statement seems superficial, but may be based on his experiences of interacting with multiple cues during his research experience as a student or taking an information literacy class. It is necessary to more systematically collect reports about heuristic rationales in order to know for certain if a heuristic is based on a robust rationale or not. However, as we will see in our different types of trust, some heuristics by their nature are more superficial than others.

4.3.3.6 Types of Trust

We coded seven types of trust, named for the underlying basis or rationale that ties it to a judgement of 'trustworthiness'. We also show how the different types of trust can fit into Hilligoss and Rieh's subcategories, based on their definitions of each (see Table 7: Types of Trust and Corresponding Heuristic Subcategory). Our types of trust coordinate with the Heuristic level subcategories with some overlap as they sometimes fit into more than one subcategory. An example is the organization/affiliation-based trust, which can relate to the source *being* a trusted organization or having an affiliation with one (source-based) or it can refer a source or information *being recommended by* an organization or person with a recognized affiliation (endorsement-based). Our analysis corroborates Hilligoss and Rieh's subcategories but also found that they were limited to only peripheral aspects of information or source, whereas we found at heuristics based on content, which included self-efficacy/knowledge, or one's trust in their own abilities in or knowledge of the subject, and design/presentation, which was mostly aesthetic-based, but included quality of language, tone of voice and other content-based qualities.

We found that the concept of 'trust' also demonstrates that categorizing heuristics by *rationale* has a different nuance than Hilligoss and Rieh's four categories: the rationale describes the connection from a quality to a credibility construct. In the subsequent sections, we explain the types of trust with examples from our data to show the rationale behind them, as well as demonstrate the role of emotion in supporting their creation, use, and sometimes, dissolution.

Table 7: Types of Trust and Corresponding Heuristic Subcategory

Rank	Type of Trust	Occurrences	Number of Participants	Hilligoss and Rieh's Heuristic Subcategories
1	Organization/affiliation	25	13	Source- based Endorsement-based
2	Relationship	24	11	Source- based Endorsement-based
3	Previous good/bad experience	23	13	Source- based

4	Self-efficacy/knowledge	21	13	Content-based
5	Platform	21	11	Media- based
6	Design/presentation	16	9	Aesthetic-based Content-based
7	Reputation/popularity	15	9	Endorsement-based

4.3.3.6.1 Organization/affiliation-based Trust

Trust in organizational sources, or sources with organizational affiliations was our most common type of trust – participants counted on governments, universities, and well-known brands for their academic, health, news, and leisure information, as well as those with credentials or affiliations with these organizations. In our examples above, both P11 and P3 trust information they get because of the affiliation with a well-known organization, and both mention the positive feelings associated with using these sources. Some, like P12 feel the opposite about organization/affiliation-based sources, associating feelings of suspicion with them.

In several cases, Organization/affiliation-based trust overlapped with the similar but distinct Reputation/popularity-based trust, and the rationales for either trusting or not trusting a source were somewhat intermingled. Here, P3 expresses her trust for a large-scale shopping website from China, Tao Bao, demonstrating a detailed rationale for the basis of her trust that includes organizational aspects (big and professional), but also the reputation of the CEO and the popularity of the platform:

> … why I can feel comfortable when I shop on the website I mentioned before – Tao Bao -why I think it's safe is because the big boss of Tao Bao is a really well-known person in the world. Like, a professor of Desautels is a fan of him…. And because the company is so big and so professional, it ranks the number one shopping website in China, so I can believe it, because they have so many users, and…most of them enjoy their shopping experience. (P3)

P3 uses both rationales as a basis for her trust, aligned with positive feelings of comfort and safety. Again, this can go both ways. P5 finds that he doesn't trust well-known news organizations because of their reputation: "oddly enough I don't trust the big ones anymore, cause I know there's just so much backlash, you know, Fox, CNN, Huffington Post…I go in not trusting them anymore, because, you know, there's just been so many allegations, so many things in the past, you know" (P5). We don't see an explicit emotional reference, here, which was the case in some examples where 'trust' was mentioned. However, this may have to do with the level of consciousness about feeling, and the length of some explanations, or time to reflect. We address this in the Discussion chapter, which looks at some of the literature on trust.

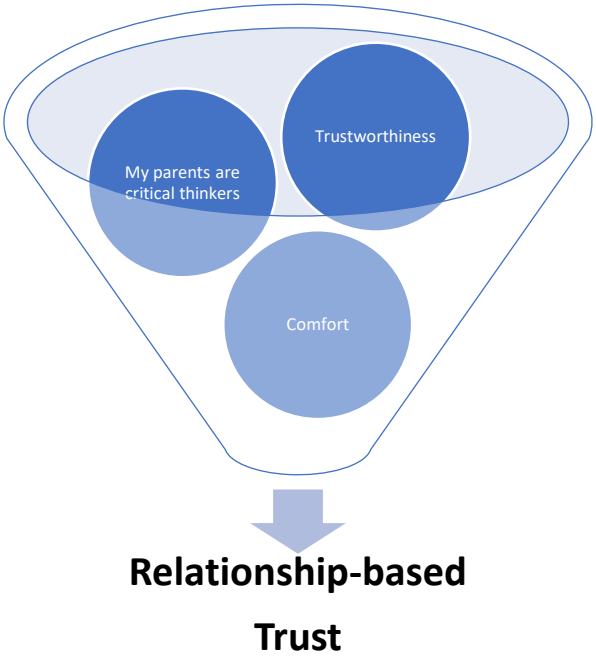
4.3.3.6.2 Relationship-based Trust

This trust was based on a participant's relationship to a source who has endorsed the information, source, or platform, therefore we categorized it as both endorsement-based and source-based. Participants found that, as long as they had a personal relationship with the person endorsing the source, there was very little need to check the credibility of that information or source further:

> I'll be, like, "Oh, I guess it might be true, it might not be true, but, like, I'll believe it because I guess because they are sharing with me." I guess it's like a trust thing, since I trust them, I'll trust whatever they tell me. (P2)

While P2 appears to unquestioningly trust the information from her friends, relationship-based trust was often contigent on an intimate knowledge of another person's expertise or experience, and not just a 'blind' trust in that person's judgement. It was also often nuanced by topic, since the person's knowledge tends to be in one area, and not for any topic in general. P12 trusts the information his sister gives him about skincare, because he has knowledge of her experience with the topic: "…something that I've heard my little sister talk about because she is very into skincare and whatever…she is my trusted source for that most of that kind of stuff" (P12).

Figure 18: Relationship-based trust components



P8's rationale when trusting information from his parents is based on his familiarity with the process by which they judge credibility: "Well, I think it comes to the same procedure. I just do check, but my parents are also the kind of person that, like, do check the outside sources for bias, so my parents are people I can believe." (P8). He is able to trust the information they give him on the basis of this knowledge, without having to check the credibility himself.

4.3.3.6.3 Previous Experience-based Trust

Participants tended to trust sources that they had already used, if those sources had been determined in some way to have had credible information before. P13 relates his positive feelings about his trusted search engine based on her memory of using it successfully: "Yeah, it comes with a good feeling that I can trust. …maybe in 30 years I won't remember the name, but when I see it, I'll be 'oh yeah, remember this is one of the search engines for research paper? So yeah, I can trust this'" (P13). P13 can quickly identify his trusted resource by the name and the look of the website and is sure this would still be the case several years later, suggesting that trust may maintain stability over time. Trust of Previous Experience-based trust went hand in hand with other kinds of trust, as trust was often developed through one's previous or continuous experience: our theme of Trust Bank explores this idea further. The above example

might also be viewed as 'platform-based trust,' (see below) however, the rationale for her trust in the search engine is not about knowledge of how the platform works, but her previous successful experience using it.

4.3.3.6.4 Self-efficacy-based Trust

Trust in self-efficacy emerged as expressions of one's own ability to judge credibility of information. "When I am judging most things, I'm using personal experience because…I like to trust myself, and I think personal experience is a good way to trust yourself and have faith in your decisions" (P11). While similar to 'Previous experience-based trust,' the focus of the rationale is one's own knowledge or skills, as opposed to the information, source, or platform. For example P17 trusts a source he recognizes from his previous experience: "…I'd know 'oh! I recognize that name, I used there source another time….' I think definitely it would be a good feeling, because I wouldn't have cited them the first time if they weren't good" (P17). Her trust is not in the source per se, but in her trust in his previous judgement of credibility, evidenced through having cited it already.

Some participants expressed that they did *not* trust their ability to judge credibility. P11, who trusted her own experience in the example above, continues later in the interview to describe how his lack of knowledge and experience in health makes him *distrust* her own interpretations of the credibility of online health information:

> So, if I'm in a situation where I don't know what I have or I'm concerned I always go see a doctor, I don't rely on the internet to self-diagnose. Because I'm not, I have zero medical experience, I have my first aid and that's it…. I've never taken any sort of, like medicine class, like I'm not on track for med school. I just don't trust myself enough to make a…I guess that goes back to how I judge credibility, I don't see myself as being a credible source of medical knowledge. Because I think it's about knowing symptoms and being able to interpret them, but it's also about having experience with different symptoms to understand when it's one thing and when it's another. I don't think I have that, I don't think I can look at a list of symptoms online and know that I have one thing. (P11)

P4 also attributes her lack of trust in online health to her inability to interpret what she sees online: “I wouldn’t say I put much stock into anything online because I tend to, I don’t know if I can really trust my interpretation whatever is going on in terms of health” (P4). Self-efficacy-based trust tended to be limited to certain information topics, types of sources, or platforms, and was not expressed as an inability to trust information in general.

4.3.3.6.5 Platform-based Trust

This trust is based on an understanding on how different online platforms function as a rationale for trusting or not trusting the information on those platforms. The rationale was the confidence that platform to continually produce credibility (or non-credible) information, based on the participants’ knowledge or presumed knowledge about how the platform works; this confidence allowed for participants to circumvent checking information from these platforms. Platform-based trust most often emerged as a *distrust* of certain platforms, specifically, social media and news information. P1 distrusts social media in general because it allows anyone to post anything, without any kind of vetting process.

> … just looking at social media I wouldn’t for a second think that it is 100% truthful ‘cause some things can be…some people can just post stuff randomly, or maybe citing it from some sources that aren’t reliable. ‘Cause they can also do that, so, yeah. (P1)

Trust and distrust could also extend to entire technologies: P5 shows a distrust in shopping on his mobile phone, although this distrust was not well-rationalized. It was, however, strongly rooted in an emotional reaction to using his phone to shop, a visceral discomfort that compelled him to stop shopping and continue his purchase at home on his computer:

> …funny enough I don’t trust my smartphone when I’m shopping. When money is involved….this was a big emotional buy because I had just broken my headphones and my brother had given them to me, and I didn’t want him to know that I had broken them...it was in my shopping cart and something about it, I was just, like, “wait, I’ll just wait till I get home, I don’t want to shop on my phone.” People do, but I don’t know, something about my phone just doesn’t seem the place that I should put in my credit

> card information. That was a huge feeling – there was no logic in that whatsoever. People do it all the time, and it works for them, but I just felt, like, "Yo, this is not for me." So I just didn't. (P5)

The combination of P5's lack of trust of cellphones along with the emotional reaction from having lost headphones that were special to him may have strongly influenced his ability to trust the transaction process on mobile technology, forcing him to wait until he got home to use his computer. Emotions about the situation are explored in more detail in our subsection on Context and Emotion (4.3.8).

4.3.3.6.6 Design-based trust

Design/presentation-based trust used design features (pictures, videos, personality, language), and general layout as a proxy for credibility, based on the rationale that a poor presentation indicates a lack of knowledge or ability, which influenced credibility:

> …if it's a sloppy presentation then I honestly just feel like that's not something that I can trust. 'Cause if it's not presenting itself in a kind of, you know, …in a manner that suggests that 'I know what I'm doing' or ' you can put some trust in me' then maybe I shouldn't be there. (P5)

P5's rationale connects good design with competency, and competency with trustworthiness. We noted other examples of this kind of rationale in subsection 4.3.3.1, with participants relating competency to video and language quality, or website design. As a heuristic, it directly connects design elements with a judgement about the information's trustworthiness, whereas at the interactive level, it spurned a reaction that resulted in leaving a source without checking.

Design-based trust typically relied on visual aspects of presentation, but also included some content-related criteria, such as Quality of language: "Yeah, so I definitely get a bad feeling…I distrust it. I assume that the information in it is going to be bad if they couldn't even be bothered to check a typo, or a spelling error" (P11). Content-based trust tends to be more rigorous since it requires a bit more engagement with the information, however, you can see

here that it still amounts to a shortcut around interacting with the information fully, with P11 admittedly assuming non-credibility with the presence of typos.

The use of Design-based trust can be nuanced. P4 does not assume more credibility with a more produced website, but looks for a balance of features:

> …really new websites with a lot of, like, flashy, I guess, effects I feel does play into credibility…I feel like there is a kind of sweet spot, if the website interface is super old and seems super outdated, or like… it feels more like a personal website that might make me less inclined to trust it, but if it looks more like an ad, it kinda puts my guard up, so it's like a middle ground. (P4)

Design was also nuanced by information topic, with different expectations for leisure information than news or academic information. P12 uses the presentation as a heuristic to find photographers who understand film photography in a more authentic way:

> …if it looks like it hasn't been edited since the nineties – I do film photography – so if I find like and old source, it feels to me more authentic to what I'm going than some guy who picked up a film camera a year ago and is like "this is how it all works." I want to hear someone's perspective from when it was the way that things were done.

While Design-based trust can be superficial as far as judging the credibility of information, we can see through the various rationales that these heuristics vary in rigor.

4.3.3.6.7 Reputation-based Trust

Reputation-based trust was based on the rationalization that if others used or endorsed the information, source, or platform, they are likely to be credible. This type of trust was based on other user's opinions and experiences, or user ratings. Repuatation-based trust varied in terms of robustness, with some basing their decisions to trust on hearsay from undefined 'others' to endorsement by specific experts or user metrics, such as the history of a source or platform. P5 gives very little rationale beyond 'a lot of people' using a source: "I can trust this, a lot of people use this – WebMD" (P5). P4, on the other hand, considered the history, other's experiences or endorsements:

> In terms of online sources if they have been around for a long time, and I've seen people cite them as well, that gives it more credibility I feel, and I feel more inclined to trust the information that they give out as opposed to if it's a really brand new website and I don't really have a context in which to place them, I don't know what other people think of the information they are reporting on. (P4)

Reputation/popularity could also lead to distrusting a source, when reports from others lead to a loss of trust as we saw above with P5 in the Organization/affiliation section. P14 tries to play the middle ground, not trusting information that is either too high- or low-rated: "Well, the things is, if they get 5 stars, I don't think I can trust it, because I think it's the company's own – hiring their own people to boost themselves up. So, when they get 5 stars, I don't really trust it. So, I trust more those that get 4 stars or 3 stars. In the middle, kind of" (P14). His rationale demonstrates an understanding that ratings can be manipulated, and so makes a rule about high or low ratings as untrustworthy. While there is a trust in popularity here, it is nuanced to include some distrust of the platform.

This type of trust often overlapped with Platform-based trust because it involves some knowledge (or assumed knowledge) about how the platform works, for example, the that top hit on Google is the most popular choice: "the links on Google, it's always the top one that shows up. If I have to change pages, I get less and less, trust into the links. So, I usually take the top one" (P14). P14 assumes the top hit of Google is the most popular and associates the construct of popularity with trustworthiness; his feeling of trust goes down with every subsequent page of hits. P10 describes his understanding of the use of popularity or upvoting on a certain platform as a sign of credibility:

> …it's even more me trusting the general consensus because it's how the website works is that the things on top of the page that you see are people that voted to be the best. When things go on top, I trust it…when I'm going into a new hobby, and I don't know what, I can't tell what, who's knowledgeable or not, then that's the only way I can tell. If it's popular, I'll think it's credible. (P10)

P10's understanding of the mechanics of the upvoting structure as well as trust in consensus is the rationale for finding information on this platform credible.

Because there are likely to be other rationales involved in credibility judgement, we do not feel that this list of trust-types is exhaustive. These are also only examples of trust in heuristics, but one we feel demonstrated how emotional information as part of the trust-building process. Although not always explicit, trust was often associated with positive emotions, such as comfort and safety, and distrust with negative emotions, such as suspicion and fear. Using trusted sources during stressful times also resulted in feelings of relief and confidence, which we examine in the next subsection on 'Trust Bank.'

4.3.3.7 The 'Trust Bank'

We stated at the beginning of the Heuristic level subsection (4.2.5) that the purpose of heuristics was to save time and energy. The issue of saving time and energy was compounded in situations that imposed deadlines or increased stress. The emotional and practical stability provided by trusted sources was best illustrated by a theme which emerged directly from one of our participants and echoed by others: the *trust bank*. The trust bank was a vetted set of trusted sources that was maintained and leveraged for several purposes, both practical and emotional. The trust bank provided dependable sources for quick reference without the need to check multiple cues, avoiding the cognitive and emotional work of interacting with new information. The trust bank also mitigated other kinds of emotional and cognitive barriers that are part of the external context: information overload, due dates, health issues, and a lack of information all contribute to feelings of stress and worry during the search process (see 4.3.8 for more details regarding Context and Emotion) . The trust bank allayed these feelings through the pre-established sense of confidence in the credibility of the information it provides.

P13, who came up with the term during his interview, describes his trust bank (described as 'list' or 'list bank' at this point), and how he uses it to verify rumours about a player trade, that he knows will be difficult to verify: "I'll just have my list in my head and I'll write it on google, and this reference: "Oh they don't have the article yet, ok, next one that seems like a good source that's in my bank of…my list bank – well this one they have it, ok good!'" (P13).

There was a clear connection between a good emotional reaction to a source and its adoption into the trust bank. Here, P13 explains how he builds up his trust bank.

> **Investigator:** How do things make it into your trust bank...?
>
> **P13:** Ok. I don't know, it's like the feeling if like, if they publish research papers for, like, known universities, or I don't know, the research paper is well built and they seem to publish just research papers that were making sense, over the year, of what I've read, then it makes it to my list. But sometimes it makes it into my list - like, for example, the engineering toolbox - it's just because I had a good feeling that it was a good reference. (P13)

We found the same concept of the 'trust bank' in other participants' interviews. P4 describes how she spends time building up her trust bank so that when the time comes when she needs it, she has her list of links already ready:

> I typically do have all my sources lined up, so I don't, like, sit down and say, "now is when I'm going to do my research." I kinda just do it whenever I have the time. I'll collect articles and then when I sit down to write, go through them. Uhm…yeah, definitely sometimes if I'm reading through a source and it's, like, maybe not *not* credible, but just not relevant, or like I feel like the author is making a huge reach, uhm, I'll be, like, disappointed because I'm stressed, and I don't have time to go looking for more sources (laughs). But usually that's not a problem because I collect so many links. (P4)

Closely related to the trust bank is the 'go-to' source, a source that – given a stressful situation, or one that requires a quick solution – can be relied upon for credible information: "I think if I felt something actually about deadline approaching well, uh, I don't think I would feel too anxious about it, because I know where to look, ProQuest is a trustworthy source" (P8).

The convenience of the trust bank or go-to source came at some cost. P5 admits that his go-to sources may keep him from encountering and exploring other sources of information:

> …'cause I'm already nervous and feeling uneasy about myself, I usually tend to fall back on something that feels normal, or something that I can trust already, so I feel in any way, that me being nervous took away from the other resource that I could have looked at, cause I just go straight at WebMD and nothing else. (P5)

P5 acknowledges the 'echo chamber' aspect of the trust bank, which introduces bias while trying to mitigate negative emotions. Bias is another area where affect influences credibility judgement, which we address further on in our analysis.

While the trust bank had limitations, it provided a dependable go-to set of sources that could be relied upon during situations which did not lend themselves to long or intense interactions with information. The trust bank could also mitigate stress and anxiety associated with those situations, by allowing participants to bypass the uncertainty of looking for new sources of information. We believe the 'trust bank' concept could be useful for IL contexts, particularly in response to information overload and information anxiety (Bawden and Robinson, 2009).

4.3.3.8 Losing Trust

While building trust established long-term relationships with credible sources, platforms, or ways of judging credibility, participants also described a process whereby trust was lost, usually through a negative experience with a once-trusted source or as a result of the information given by a source, which was then generalized to a larger context. P9 describes his feeling of frustration when a trusted doctor was found to have misdiagnosed his ailment, causing long-term distrust in the advice of doctors in general:

> I was mostly a little, I guess, frustrated because I was dealing with that for a couple of months at that point, and when I found out that I was going through this antibiotic treatment that just wasn't doing anything, and then finding out that it wasn't that at all was just, like, (laughs) it bothered me a little bit. And I guess now it kind of…it taught me that doctors aren't, like, 100% they are right all the time, like, just accept what they say, which is what I used to do. Now I just kinda, like…I'm a bit more, I guess, critical…about, like, what they say. (P9)

While he lost trust in his doctor, he also learned that it was important to sometimes perform extra credibility checking of trusted sources, in order to maintain a strong rationale for their continued use, or to learn about new possible sources or techniques for checking – in this case, he used an online source and his own personal experience of his continued symptoms to find more accurate information about his condition.

We noted loss of trust in relation to the trust bank as well, also related to negative experiences. P13 describes how sources may lose their 'trust bank' status based on negative experiences with them:

> Yeah, so I have a list. I guess if I can trust a website, it's going to be in my source in my good trusty-list, but if I can't trust over time, usually there's one trial or two and then it's out; so, like, it's not like 10 times, it's the first time, second time – actually usually it's just one trial: "ok, first, ok, no, ok, never coming back to that website." (P13)

P13 does not need much to challenge a trusted source and remove it from his list, only one negative experience, in some cases. He goes on to describe the role of emotion in both the building and losing of trusted sources in the trust bank: "The feeling will just boost the source, or just kill it right away. Two extremes, I guess." (P13). Emotion plays a key role in establishing and challenging trusted sources. We found this to be true in general for heuristics, described futher in the next subsection.

4.3.4 Conflicts between the Heuristic and Interaction Levels

The distinction between the Interaction and Heuristic levels in our analysis is conceptual, but in reality, participants used both levels iteratively during credibility judgements. Sometime participants reported using a heuristic until a certain interaction with a particular information object challenged that heuristic, also a finding in Hilligoss and Rieh's study. Emotion played an important role in the process of challenging a heuristic, as it was often an emotional 'flag' of some kind that marked when a heuristic was not working. We saw earlier that P2 considers .org and .edu sources to be credible based on her grade 7 teacher's recommendation. We also saw the beginning of this heuristic being challenged through her feeling of doubt about it. In the example below, P1 explains that he would normally be satisfied with the heuristic

that something in the first five hits on Google is credible, unless the content was 'ridiculous,' inspiring a feeling of surprise:

> …if I start with a "WOW! How is that true?" Like, it depends, if it's something good, and they didn't make any ridiculous claims, then I'd trust it, just looking at if it was on the first five hits of Google, then I would probably say it's probably true if it makes sense; it's not that ridiculous. But if it's a ridiculous claim, then I'd have to confirm more than it being in the first page of Google. (P5)

The feeling of surprise is an emotional cue that motivated more checking at the Interaction level, overriding the heuristic that the first 5 hits on Google are trustworthy. P5's experience may not change his use of the first 5 hits on Google as a heuristic in the future, but it does show that both heuristics and interaction can occur in credibility checking, and that emotion can be a catalyst in challenging a heuristic.

In this example P3 explains that her previous experience with a scam artist on a particular social media commerce site made her distrust any commerce site that requires entering a password:

> I'm not always thinking about it when I'm shopping online, but if there is a website that I need to enter, or there is somewhere that I need to put my code, I will always think about it…I get a feeling….afraid. In my heart – deep afraid. Yeah. And unsafe, uncomfortable, like, after this event, after this issue, I encountered another situation that I have to put my code of the same account number, so I don't know whether it's true, so after I put in the code, I immediately changed the code of the account numbers. So I keep changing the code of the account numbers, after I put them in. It's not a…it's really not a good experience…it's like, not a good feeling, but it can be like an experience for me, because I did learn something, like, the online safety or something. (P3)

This example shows that through a very emotionally fraught interaction with one fraudulent seller, P3 has completely lost trust in online commerce security. However, she is able to come away with somewhat more self-efficacy-based trust, having learned to be more careful online,

which is an interesting and positive outcome of a very negative experience. This experience demonstrates the 'learning' role of the interactive level in challenging and reframing heuristics, as well as the importance of emotion in this process.

4.3.5 The Heuristics Level and Emotion - Summary

The Heuristic level provided stability through previously tested, or otherwise rationalized rules for quicker and more efficient judgements of credibility, eliminating the need for more effortful interactions with cues, both cognitive and emotional. We have seen how emotion supported these rules, particularly in the case of trust. Trust as a heuristic was an important theme in demonstrating how heuristics integrate rationales and emotions with a construct of credibility: trustworthiness. Using Hilligoss and Rieh's definition of heuristic to help define trust has also made a clearer definition of trust with regard to credibility as well as a clearer relationship between trust and trustworthiness. As a construct of credibility, 'trustworthiness' is the main consideration of this type of heuristic, although not necessarily the only one, as several participants referred to believability and truthfulness in conversations about trusted sources.

The relationship between trust and trustworthiness can help delineate the Heuristic level from the Construct level of Hilligoss and Rieh's framework: *trust* is the heuristic employed by the user while judging credibility, while *trustworthiness* is the construct of credibiliy guiding the strategy. The Construct level of credibility corresponds to a user's overaching definition of credibility, and as such, is the most stable and unchanging characteristic of credibilty, although it is influenced by context as we show in subsequent subsections. In the following subsection on the Construct level, we also show that emotion also plays a role in the constructs of credibility that guide credibility judgements.

4.3.6 The Construct Level and Emotion

According to Hilligoss and Rieh, "the construct level is the highest in the framework because it concerns itself with how a person conceptualizes and defines credibility, providing a particular point of view for judging credibility in fundamental ways" (Hilligoss and Rieh, 2008, p. 1474).

We have demonstrated in our findings that emotions function at the Interaction level, providing cues or information about cues in all subcategories. We have also found that our emotions act at the Heuristic level, supporting the establishment of rules and rationales for judging credibility. In the case of trust, trustworthiness is the overall construct that provides the point of view for judging credibility. To 'believe' or 'rely on' information would relate to the 'believability' or 'reliability' constructs of credibility. 'Objectivity' is another construct that may guide heuristics, such as the preference for a balanced or unbiased point of view. There is some overlap and even interchangeability among constructs, particularly with respect to everyday parlance; we observed the use of 'trusting' and 'believing', used in the same descriptions of credibility. Constructs are also somewhat dependent on the information context, which we examine in the next subsection. In the Construct level, our participants associated emotions with their overall definitions of credibility and their final credibility judgements, indicating that credibility (or non-credibility) has an overall feeling.

4.3.6.1 Participants' Definitions of Credibility

At the beginning of each interview, we asked the participants their interpretation of the term 'credibility' before we asked any other question. This was in order to establish validity, but also to get participants' unbiased ideas about credibility, before we had them think about various situations or topics. Similar to Hilligoss and Rieh's findings about construct, our participants used the terms 'trustworthy,' 'factual,' 'accurate,' 'reliable,' 'integrity,' 'real,' and 'believable,' when asked what they thought of when they heard the word 'credibility.'

We also found the use of emotional language in these first definitions of the term 'credibility,' such as feelings of comfort (for credible information) and manipulation and suspicion (for non-credible information). P1 uses the term 'safe' in his definition of credibility, indicating a need for information to provide assurance as well as reliability: "…credible, something which you can trust, as I said, safe, and has integrity…" (P1). When discussing her definition of credibility in health information, P3 describes her feelings of discomfort with never being able to find a consistent answer when searching for online health information: "Yeah, really uncomfortable because there is no exact answer and too many so-called experts" (P3).

After responding to the question about credibility, interviewees were asked if they saw the term 'credibility judgement' differently than 'credibility.' Almost all participants answered that the two concepts were different; many saw 'credibility judgement' as a *subjective decision-making process* of perceiving credibility and 'credibility' as an *objective quality of information* that exists separately from one's ability to perceive it: "Credibility, I would think of that as its own kind of thing and a trait you assign to things, whereas credibility judgment would be the act of saying 'that is credible, that is not credible,' and the process you go through." (P15). P7 expresses this distinction almost identically: "To me it seems like the process of deciding what is credible or not. So, like, credibility is like an entity and credibility judgment would be the process of deciding that entity." (P7)

This dual nature of credibility was noted in our literature review, both with respect to credibility and again in the literature on trust and trustworthiness: credibility according to our participants exists independently of one's ability to perceive it and is the domain of the information object; credibility *judgement* is a process of discovering credibility and is the domain of the user. These descriptions seem to fit Hilligoss and Rieh's framework with 'credibility' *per se* as part the Construct level, and 'credibility judgement' as the processing, or Heuristic and Interaction levels. For our analysis, this distinction is useful for determining the role of emotion in the construct of credibility as opposed to its role in the process.

4.3.6.2 The 'Feeling' of Credibility

To find evidence of emotion at the Construct level, we first looked at the overall definitions of credibility and credibility judgement as well as descriptions that referenced emotion as part of the final decision or judgements of credibility. The overall judgement of credibility led to either a decision to believe, trust, and in some cases the use of the information presented. P5 describes a 'good feeling' when deciding she should choose a certain restaurant: "…if something looks like you will be eating it, like if I see something and, like, 'I would eat that' and then it's, like, 'maybe I should go there.' That's like the good feeling that jumps out." (P5). The feeling seems to reinforce the judgement that the information about the restaurant being good is credible.

Sometimes, participants expressed the feeling of credibility as the *result* of the process of checking credibility leading to a decision about credibility – the credibility judgement itself. P15 explains the feeling in relation to judging credibility and non-credibility in academic information:

> Well, sometimes, for certain sources of information - probably more academic sources – I'll…there's like a certain feeling it's supposed to have, I feel. Where it's not super aggressive about "this is the information I'm right no matter what," but "Ok, here is the information, and this is why it's legitimate, this is where I'm getting my sources from, this is where, if you want to research more, you can find it. This is maybe a counterpoint, but this is how I deal with it." (P15)

P15 does not report a specific emotion, but a feeling related to the overall credibility regarding academic information. For her, this calm or 'non-aggressive' feeling accompanies credibility.

As we saw in the Interaction level, participants often went through a series of emotions before landing at a credibility decision, if one resulted. It is difficult to say if the summative emotion at the end of the credibility checking process is the overall feeling of credibility in these cases, since there are several, sometimes opposing emotions, as with this account from P12:

> Bad feeling comes at the beginning too, with things that I've seen before, but like, with reactions and authors, unless I see the author first, I'll see if I have the good or bad feeling about it, but then, other users reacting to a posting – that's near the end of stuff, and it's like, ok then after I have read all the stuff that other people have to say about it, what do I feel about it, the situation or this information. (P2)

P2 asks himself "what do I feel about it," which is the key operationalization of Schwartz's feeling-as-information theory: at the end of several interactions, a final feeling is associated with a decision. Because much of this checking process is subconscious, however, it is difficult to understand the relationship between the feeling that accompanies the final judgement and the emotions which are part of the checking process.

4.3.6.3 Information Topics and Constructs

Credibility constructs tended to be stable, both in our participants' definitions and in the literature and included believability, trustworthiness, truthfulness and reliability, but sometimes - depending on the specific information topic - may include other constructs that we also included in our criteria. This is consistent with Hilligoss and Rieh's claim that heuristics can sometimes operate at the level of Construct, if they are used often and considered to be the overarching aim for credibility judgement, which can change depending on the information topic (we explore information topics further in the subsection on Context). P10 explains that different constructs of credibility apply when comparing leisure information to academic information:

> …in terms of leisure, a credible source, on leisure advice, would be things that I'd actually enjoy, and academic would be…credible academic sources would be along similar lines where it's… it's data published with an intention of being truthful. (P10)

For P10, leisure credibility is associated with *enjoyment*, whereas academic credibility is associated with *truthfulness*. The following subsection presents how agreeableness and enjoyment could be considered at the level of construct in certain contexts. We also look at the role of emotion in how these constructs are defined and employed.

4.3.6.4 Agreeableness as a Construct of Credibility

Participants pointed out that, depending on the circumstances, agreeableness – also expressed as 'enjoyment' or 'pleasure' - can be an important consideration in credibility judgements, or it can obstruct them. Agreeableness implies an emotional dimension; agreeableness depends on one's pleasure or enjoyment, which are generally determined by one's emotional reactions (Zajonc, 1980).

For P17, agreeableness in the form of enjoyment was the aim for her judgement of a restaurant that she wanted to go to with a friend:

> I was going with my friend and I'm a very picky eater, my friend's a picky eater, so we needed to find something that we would both enjoy, that was worth it…my friend is

> allergic to fish, so anything that had seafood, like, "no." I don't like cheese, so I have to find somewhere where it's not primarily cheese-based food like Mexican…. We usually just go to Italian restaurants, and we found this really good one, we found a good Italian restaurant, it was close to where she lived, so it was great for her. (P17)

The aim of her search was directed toward satisfying their tastes and experiencing enjoyment, which directed what strategies she would go on to use, including convenience and previous experience.

Agreeableness could also confound a search if the search confuses agreeableness with other credibility constructs, like truthfulness. This was often the case with 'confirmation bias,' or the favouring of certain information sources or platforms over others when they agree with one's own point of view. P7 describes his conflict between two sources of information with very different approaches and perspectives: "They all felt very credible to me, and that was my problem…I wanted one to feel more credible than the other, I wanted the data-driven one to feel more credible than the anecdote-driven one" (P7). P7's desire to choose a source using an approach he found more favourable came into conflict with his overall judgement that both approaches were credible. P7 states that he wanted to 'feel' that the more agreeable source was more credible; these feelings were in conflict with his other feelings that both approaches were valid. It is evident in the conflict that he recognizes agreeableness is not a legitimate construct for the kind of information he was seeking. We address confirmation bias as well as differences between leisure information about other topics in the *Context and Emotion* subsection (4.2.10).

4.3.6.4.1 Credibility and Entertainment

The subtheme of agreeableness and entertainment came up mostly in regard to satire news stories. It raised the issues around using website sources for information or entertainment, and how such use can confound some credibility practices. Our participants reported that they were sometimes fooled into believing that satire news stories were 'real,' but that their realization of this did not mean that they lost trust in that source or platform, and in fact sometimes continued to use it for credible news. P13 experienced several emotional cues about a satire

news stories while going through the process of discovering that the story was, in fact, a joke. Rather than avoid the source, P13 learned to be aware of satire and enjoy it for entertainment purposes:

> At the beginning it was a bad feeling because it was bad news, and then after, I don't know, I felt really mad that I got fooled, but at the same time it was funny. So, I just put it in the list 'don't trust, pay attention to this name' - but it's funny to see what they post. (P13)

In some ways, the use of satire in news can be a more *enjoyable* way to encourage vigilence when judging credibility, espousing positive emotions like amusement and interest. In the subsections on the Interaction (4.2.3) and Heuristics levels (4.2.5), we found that generally negative emotions were experienced as motivators to check credibility; satire news was one of the instances where positive emotions encouraged checking. P11 uses satire news both to entertain and to help ascertain facts, based on her understanding that they often refer to an issue, person, or situation with some basis in reality:

> I'd say that sometimes it does get the facts right, but it just twists them a little, like the political headlines are sort of half-true. …I'll usually go to a news source that I trust, that I think is fairly neutral, and I'll just double-check to make sure that I have it right, especially thinking of the ridiculous things that have been said by people in public places recently. I'll be like "Oh I'm pretty sure they said that, I'll just go to double-check to make sure." (P11)

To parse out facts from fiction, she checks the story with a trusted, non-satirical source. While not a construct of crediblity, entertainment helps to define credibility by providing a contrasting construct that challenges more traditional ideas about credibility and information.

4.3.7 The Construct Level and Emotion – Summary

The evidence of emotion's influence at even the highest level of credibility suggests that emotion has been a missing factor of import in research on credibility. Constructs are the guiding principles of credibility judgements, therefore, emotion can be considered to be guiding

our credibility judgements, as well as giving important information and motivating them. Hilligoss and Rieh's framework is explicit in the inclusion of context as an important factor in how credibility is processed at the different levels; we found that context was central to deciding which construct was most appropriate. The next subsection explores various contextual factors that were both built into our data collection, in the form of information topics (health, news, leisure, and academic), as well as other contextual factors that emerged from the interviews. In this subsection, we draw on the distinctions between integral and incidental emotion from our theoretical framework to help understand how emotion may be influencing credibility in regard to context.

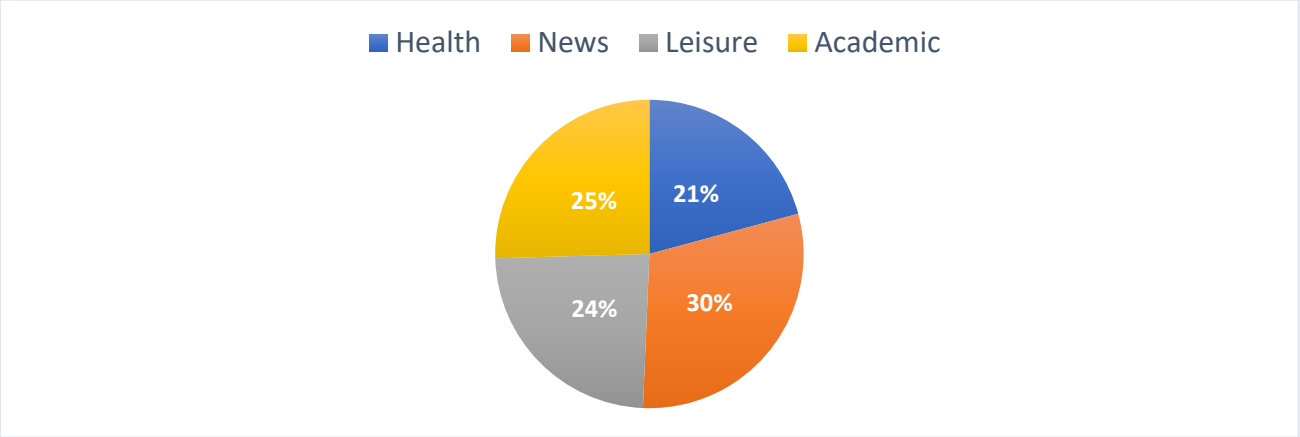
4.3.8 Context and Emotion

According to Hilligoss and Rieh, context represents the conditions that *constrain* credibility checking strategies, including what information might be considered credible: "The data analysis reveals that contextual factors can intervene and influence credibility judgments by constraining selection of resources for a particular information seeking activity" (Hilligoss and Rieh, 2008, p. 1479). We used Hilligoss and Rieh's definition of context in our analysis and extended it to include factors that also *enabled* the selection of resources and credibility checking activities, based on our observations that some contexts, for example, leisure information contexts, allowed for more open idea of credibility. In addition to information topics, we coded 'situational factors' when an aspect of the situation influenced credibility judgements by either *restricting* or *enabling* the selection of sources or credibility checking strategies.

Built into our study were four information topics that acted as fixed situational factors: health, news, leisure, and academic; Figure 19 shows the occurrences of topics in our interviews. These topics are representative of every participants' responses – all questions and responses about credibility were in the context of at least one of these topics. Although we were fairly open with what topics people chose to discuss, we often prompted for responses in one of our four topics if they were not forthcoming. Figure 19 shows that our interviews were relatively

balanced by topic, with slightly more news information (30% of occurrences) and slightly less health information (21%); academic (25%) and leisure (24%) information were almost even.

Figure 19: Occurrence of information topics in interview data



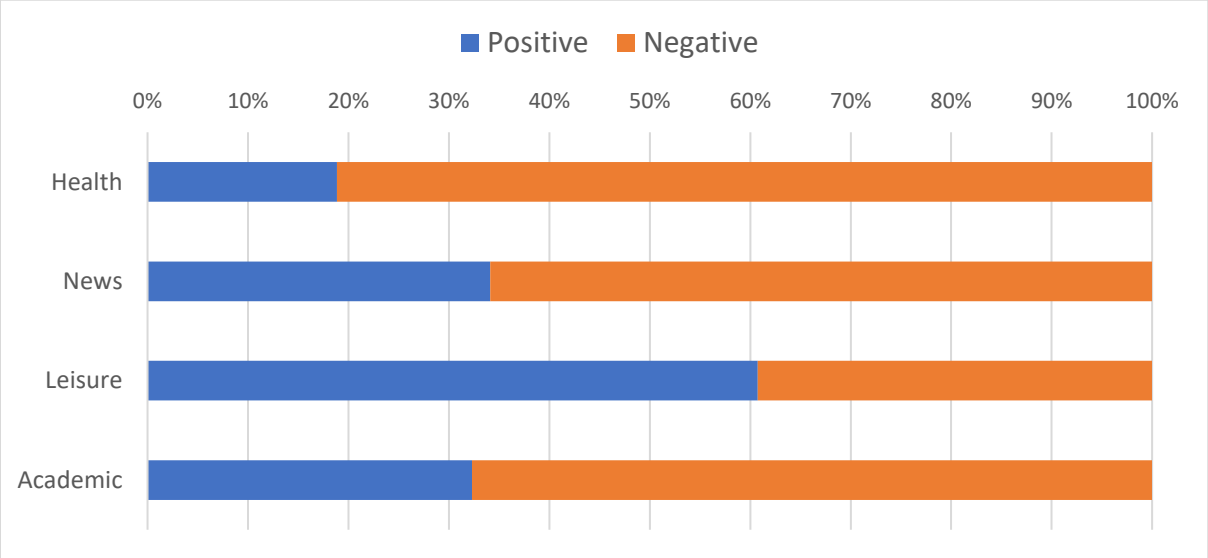
In addition to the topics, six situational factors that influenced how our participants selected sources or checked credibility emerged from the interviews: importance, urgency/time constraint, convenience, information overload, lack of information, and current political climate. Information topics and situational factors coincided with certain emotions, which in turn influenced credibility checking (see Table 8: Top Emotions for each Information Topic below). We discuss these factors in more detail in subsequent subsections.

Table 8: Top emotions for each information topic with occurrence (in brackets)

Health	News	Leisure	Academic
Stressed/Desperate (8)	Interested (16)	Excited (18)	Skeptical/doubt (8)
Afraid (7)	Annoyed/irritated (10)	Disappointed (6)	Excited (6)
Worried/Concerned (6)	Suspicious (9)	Interested (4)	General bad (5)
Relieved (5)	Frustrated (9)	Comfortable/Comforted (4)	Stressed/Desperate (5)
Uncertain/confused (5)	Skeptical (9)	Like/Love (4)	Suspicious (5)
Skeptical (5)	General bad (7)	Appreciative/thankful (4)	Interested (4)
Suspicious (4)	Angry/Upset (6)	General good (4)	General Good (4)
	Sad/depressed (6)		

By looking at the top emotions, we can begin to see that certain topics elicit emotions of different valence. Figure 20 shows a comparison of the emotions that co-occurred by valence for each topic. There is a clear difference among topics, particularly with respect to leisure, which – perhaps intuitively – is associated with more positive than negative emotions, both within the topic and compared to the other topics; all other topics have more negative emotions than positive ones. We discuss these differences in more detail in the subsection on each topic.

Figure 20: Comparison of negative and positive valence emotions by topic

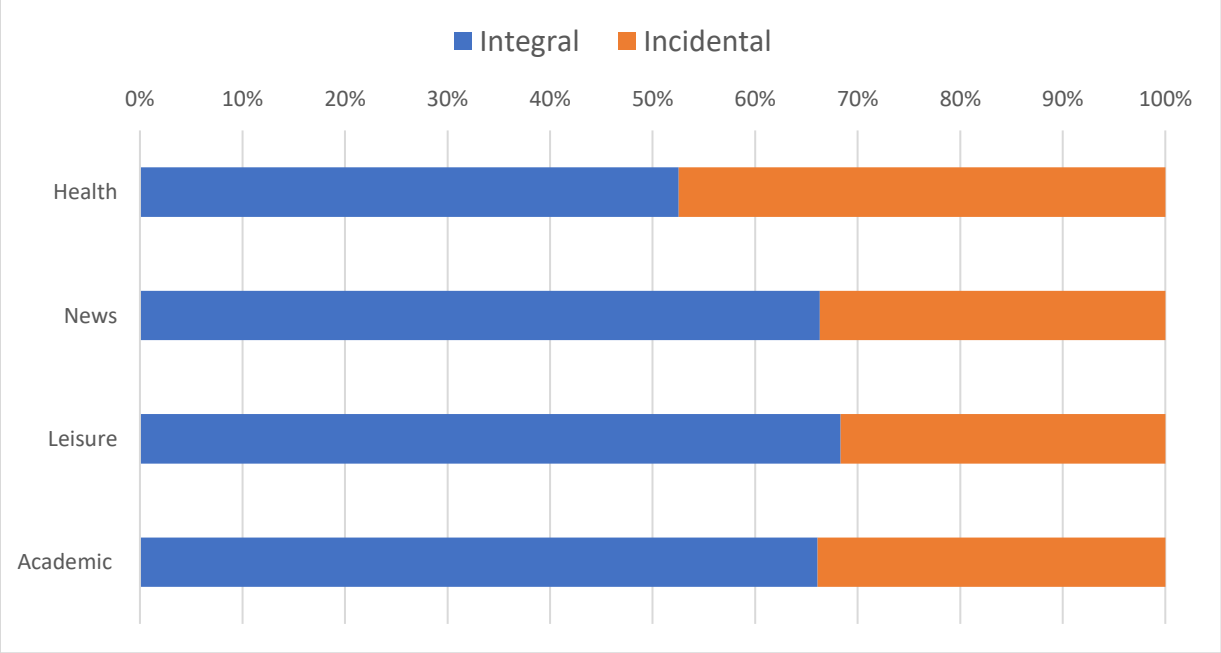


Emotions associated with information topics and situational factors were considered to be part of the context, because they played a part in the restricting and enabling of credibility checking. Hilligoss and Rieh, in fact, give their own evidence of the role of emotion in context in the example of a student who restricted his use of Web-based resources because of the academic context of his assignment: "he noted that he was reluctant to use many Web resources out of fear that they would be perceived by his professor as non-credible simply because they were Web-based" (Hilligoss and Rieh, 2008, p. 1479). They specify that his *fear* about his professor's judgement was a reason for his restricting Web-based source. In our study, the professor's judgement was also considered a criteria for judging credibility, however, this does not

contradict Hilligoss and Rieh's finding, since this fear could play both roles depending on whether it is *incidental* or *integral* to the credibility checking process.

In order to distinguish between emotion as part of context and as part of the other levels of the Framework, we used the concepts of *incidental* and *integral* emotion in our coding and analysis. As we noted in our Theoretical Framework (2.2), integral emotions are emotions that are directly related to the event or object at hand, whereas incidental emotions are carried over from external situations, events, or objects. Emotional cues and emotions as part of interactions and heuristics tended to be integral to the process of checking and judging credibility; emotions relating to the situation that led to the behaviour, however, are external to judging credibility, and as such, are incidental to judging credibility. However, they influence credibility as part of the context, enabling and restricting activities relating to credibility. Figure 21 shows a comparison of incidental and integral emotions by topic. Health information stands out as having more incidental emotion occurrences than the other topics, which are all fairly even. We discuss this in greater detail in subsequent sections.

Figure 21: Comparison of integral and incidental emotions by topic



4.3.8.1 Incidental and Integral Emotions

Our findings somewhat challenged our understanding of incidental and integral emotions going into the study. In the literature, it is generally agreed that while integral emotions are elicited in relation to judgement of the object at hand, whereas incidental emotions are elicited from some other source, and as such as irrelevant to the judgement of the object at hand (Schwartz and Clore, 1988; Lerner and Keltner, 2000; Schwartz, 2010). However, this is not always clear in the literature, with Lerner er al. defining integral emotions as those emotions *felt at the time* of the judgement (Lerner et al, 2015). Schwartz, whose Feeling-as-information theory is used in our theoretical framework, explains: "When a feeling is elicited by the object of judgment ('integral' in Bodenhausen's, 1993, terminology), it provides valid information about the person's own response to the target…. When the feeling is due to some other source ("incidental"), however, it provides (potentially) misleading information" (Schwartz 2010, p. 9). While this was generally the case with our analysis, we found it difficult to apply these distinctions to the emotions that came from the information *need*, or the reason for the information seeking in the first place. While these emotions seemed relevant to finding the information, they did not appear to be relevant to the *judgement of credibility* about the information, or the information object at hand. In many of the cases where emotion motivated the information search, these same emotions also motivated the credibility checking. This was a particularly important issue with regard to health information, which involved strong, negative emotions about the health concern, which tended to influence subsequent credibility checking, but not always in a way that was relevant to the credibility of the information. What was clearer was that *integral* emotions were those directly associated with the credibility of the platform, sources, or content.

In this example, P14 refers to a general 'mood,' but her description is ambiguous as to whether the mood as coming from the situation where the information need arose or not:

> "Like, if you are in a bad mood, you look at something, you don't really care anymore, you are just going to take it and be done with the assignment, you just want to put it in your project and be done with it. So, it kind of affects the credibility. So, for leisure, it

can affect in a good way, like it can hype you up or something. So, I guess it works in both ways." (P14)

We could assume that the bad mood here refers to the emotions from the project needing to get done, and the good mood from the interest or enjoyment about the leisure topic, or she may simply be referring to a completely unrelated bad mood. This example shows some of the grey area regarding incidental emotion and mood that we referred to in the literature – we address this more in the Discussion chapter. In any case, P14 response shows an awareness that the impact of incidental emotion – negative and positive - can be both beneficial and detrimental to credibility checking depending on the context. In both cases of incidental emotions emerging from information need or another source, our findings were consistent with this.

Incidental emotions influenced which cues were perceived during a search for credible information, including the perception of emotional cues. Participants reported that they were aware of increased negative emotions during the process of looking for credible information about their health condition. P6 explains how stress may be influencing his credibility checking of health information: "…it's just a feeling that kind of escalates the more and more you do research and the more and more you don't find what you are looking for…but you don't know what you are looking for so you just keep looking" (P6). P6 does not feel that his emotional state entering his research was affecting his ability to find credible information, but he also reported escalated feelings of negativity during the search. It is possible that incidental stress affected his perception of other negative emotional cues during the search process, which may also have influenced how he perceived other cues.

In most of our examples, incidental emotions referred to those that arose in response to the situation which lead to the information need. In a more straightforward example, P10 describes how his excitement and it's influence on his ability to judge credibility: "I think if it's something that I'm excited to learn about, I'm more gullible" (P10). By 'gullible' the implication is that he was likely less skeptical or suspicious, possibly overlooking cues that would lead to a judgement of non-credibility.

While we found evidence of incidental emotion in relation to all four information topics, health information tended to have more obvious effects from incidental emotion, as the situations leading to a need for health information is usually emotionally charged. In the following subsections, we report on each topic as well as our six situational factors in order to demonstrate the influence of incidental emotions on credibility.

4.3.8.2 Health Information

For most participants, the circumstances leading to the need to search for health information online were frought with emotion, which influenced several aspects of IB generally, and credibility judgements specifically. Table 8 shows that health information contexts elicited negative emotions, which included stress/desparation, fear, and worry that, although often motivated the information search, were incidental to judging credibility. Figure 20 shows that the large majority of emotions were negatively valence (81%), and Figure 21 shows that almost half were incidental to judging credibility (47%); both were highest compared to the other topics. While negative emotions often motivated more crediblity checking, it was not always the case with incidental negative emotions, such as stress and fear. Health information having more incidental emotions than other topics may be explained by the strong emotions coming from the information need itself.

The influence of incidental emotions was very pronounced here, with participants reporting several ways in which the worry and fear around their health situation influenced how they perceived information and judged its credibility. Participants reported missing or skipping over cues that might have helped them to better judge credibility because their emotions compelled them to consider only cues that related to the worst-case scenarios. They also reported that their fear and worry was augmented by the use of health websites, particularly those that tended to provide what they felt was too much information. P5 explains that when using a tool that provides all possible diagnoses for his symptoms, his nervousness led him to focus on the worst diagnoses and ignore the less serious outcomes:

> I could have also had a cardiac arrest and that was scary to see, but on the lower spectrum, I could have had heartburn, so you know, because I was nervous, I was expecting, kinda the worst, so I had gone to…being nervous I just keyed into almost the worst, because you know, expect the worst, and then get better, I guess. So I was like "ok wow! Cardiac arrest!" (P5)

P4 prefered to avoid online health information altogether because she knew her stress about her condition would lead to believing the worst case scenario, creating more stress:

> …symptoms can be proscribed to so many things, and I am prone to, like, really contemplating the worst scenarios possible, so it doesn't help me at all to go online for any kind of health stuff, it just stresses me out even more, so, uhm, I don't really go online for health-related stuff. (P4)

The impact of incidental worry and fear about diagnoses has ramifications on the design of health resources, whose designers may not be considering that emotional users will filter out reasonable diagnoses and focus on the worst-case scenarios.

P11 has a more nuanced approach to finding credible online health information. She is uncomfortable diagnosing herself with information online, but she is confident in finding credible information online about treatment after the diagnosis has been made by a doctor: "…so I guess with diagnosing I get a bad feeling…so I try to use it more for treatment of something that's been confirmed" (P11). This insight about herself means she can find comfort from the information online without letting the fear of a bad diagnosis get in the way; suggesting that some awareness of the role of emotion in credibility judgements is beneficial.

Positive feelings were also associated with credibility judgements about online health information because they often resulted in relief about the resolution of uncertainty. P2 associated relief with finding credible information that confirmed a diagnosis of strep, because the diagnosis reduced the feeling of uncertainty about her condition: "It was relief to a certain extent, because I was stressing that I thought had strep throat and I was freaking out still, but I was relieved that I had something to call it" (P2). This example helps to disambiguate the

influence of integral emotion (her relief associated with finding credible information) and incidental emotion (her stress about her health condition).

We also found that incidental emotions had a motivational effect, even when those same emotions negatively influenced the ability to check credibility. P4 explains that panic compels her to find information online even when she feels this information is likely to be non-credible:

> Uh, mainly panic. Yeah, uhm…and like, particularly when you go to these like, so stuff like WebMD or Wikipedia, it's like "oh well, it could be this, or it could be that" or whatever…it's a feeling where I want to check, even though I know it's not helpful, and it probably isn't very accurate… (P4)

Other participants mentioned a need to search for information as a way to manage or deal with their emotions regarding their health by giving them something to do, even when they felt that this information may not necessarily be credible: "I usually just have to do my own research before going to see the doctor, but I never completely trust what I see online" (P5). This need to look for information is different from the motivation to check credibility, as one is a motivation to search, regardless of credibility, and the other is the motivation to check credibility, based on cues in the information.

4.3.8.3 News Information

As with health information, news information was associated mostly with negative emotion (66% - see Figure 20); while the top emotion was interest, the following emotions were all negative, including annoyed/irritated, frustrated, and suspicious (see Table 8). News information mostly involved integral emotions (66% - see Figure 21), perhaps because news information was not usually sought to satisfy a particular need, but encountered while continually browsing newsfeeds and social media. Cases of incidental emotion involved feelings of interest in a topic, which usually motivated searching and enabled more credibility checking. Integral emotions, mostly negative, were generally in reaction to the source or content, rather than the situation, with participants encountering headlines or posts while browsing their newsfeeds.

As we showed in the Interaction level subsection, integral emotions were often helpful in evaluating certain cues, giving information about the cue. However, in the case of news, many of the negative emotions experienced while checking credibilty resulting in avoiding or ignoring cues that may have been useful in achieving a balanced point of view. P12 admits that his frustration toward a story regarding a politician he favoured restricted his credibility checking and led to his believing the story immediately:

> …all this stuff about Bernie Sanders being sabotaged and stuff, I was definitely all over that and I don't think I checked any facts about it, I was just very frustrated and, you know, found myself like, in an emotionally fueled position about it and didn't check all the facts or anything. (P12)

When discussing whether P16 considered other peoples' reactions when judging the credibility of news information, she stated that her negative feelings towards there comments would make her avoid reading comments:

> For example, the policewoman – I don't know if you say that in English – that has a veil, I think you call it – the Burka I think it's called. There was a lot of – I don't want to call it a debate, but people were not happy about that, so the comments were really negative and mean, so I cannot read them for those kind of news, because it just gets me frustrated and doesn't get me anywhere. So, I don't really factor in the comments. I tend to ignore them most of the time (P16).

Although avoiding these negative comments may have saved her a lot of uncomfortable emotions, it is possible that, by avoiding all comments, she may have missed some useful information. This bring to bear the issue of bias, or being in an 'echo chamber,' which our participants often reported as something they wanted to avoid.

On the other hand, participants were hyper-aware of the bias they detected in news information sources, which influenced them to avoid sources they saw as unbalanced, and to tend towards sources they perceived as unbiased or 'balanced'. P5's reaction to bias leads to avoidance of 'click bait' in news headlines:

> I can't trust it, I feel like I can't trust it. It's loaded there's probably going to be a lot of bias. It was probably written by someone who is in a way very passionate, or not even passionate but somehow impacted or like…has dislike for one of the groups involved in this and is writing this to lead you to follow their certain belief. And that is something I don't want. (P5)

P5's lack of trust about the bias of sources using clickbait restricts his further reading of the information provided in these sources, regardless of the credibility of their content. In many cases, avoiding clickbait is a helpful heuristic to avoid misinformation. However, this restricting of credibility checking has implications for the ability to *synthesize* information, an important IL skill, which we discuss in a later subsection (4.3.10.2.1).

The top emotion, interest, had a strong, motivating effect on credibility checking. Participants admitted that their intention to check credibility was related to their level of interest in the topic. P17 explains that her strong interest in a current news story drives her to research into the issues: "…if there's one thing that I'm going to care about, it'll be sexual assault and suicide. If there's a scandal, I'll want to research into it. There are things that I'm very invested in" (P17). A lack of interest can have the opposite effect on credibility checking. P2 admits that she did very little to check the credibility of a story her mother asked her to follow-up on because she was not interested:

> …she wouldn't stop talking to me about Elon Musk and Space X, this was like before SpaceX happened. And she was, like, "yeah, go search it up" and "oh my god, it's so interesting," and I'm, like, "ok, yeah, I'll go search it." And then I just go on the front page of the SpaceX thing, and I click on 'What is SpaceX' and I just skimmed through it and was, like, "yeah, I looked at it. It looks so interesting." And that was it, because I didn't want to do it to begin with. (P2)

In this case, P2's lack of interest inhibited her credibility checking and she, performed only a cursory review of the company's website.

While emotion in news information often motivated a desire to learn more about an issue or topic, it also led to less checking, and even ignoring certain cues. In this sense, emotion can bias credibility checking, favouring cues that support one's point of view and ignoring those that do not. We describe this finding in our theme of Bias and Confirmation Bias (4.3.10.2).

4.3.8.4 Leisure Information

Leisure information was an outlier among topics, particularly with respect to the valence of emotions: it was the topic with the most positive emotions by occurrences, and the only topic where there were more positive than negative emotions (61% - see Figure 20). Table 8 shows top emotions such as excitement, interest and comfort in leisure information; although disappointment did rank 2nd, it was the only negative emotion out of seven top emotions.

Excitement was the top emotion by a wide margin, and often motivated credibility checking, although it was usually incidental, arising from the need for information. However, integral emotions played a strong role in leisure information in the sense that they informed participants about the pleasure or enjoyment of the information. Leisure had the highest ratio of integral over incidental emotions out of the topics (68% - see Figure 21). As we found in the construct subsection, it was important that the information was checked for its capacity to produce an enjoyable experience, making emotion part of the overall construct of credibility. P10 gets a positive feeling about the passion and generosity of his sources in leisure activities:

> I get a good feeling when it's a page, like, that…when it's more about leisure. It makes me happy to know someone is passionate about this and is willing to share it with other people. Less so with news and academic…especially with news. (P10)

P10 recognizes that leisure information credibility is subjective, based on shared passions and interests, unlike news or academic information. His pleasure at the site of another's passion helps him to identify when information about the topic is authentic.

Leisure information was less restrictive about which sources or information could be considered credible. Leisure information was also an outlier from the other topics when it came to how credibility was checked, or if it was even checked at all. P7 points out that

checking the credibility of an opinion may not really be an issue, since it is based on subjective experience: "…in terms of credibility I'm reading transit blogs…and I don't really know how it can not be credible, I mean it's just like an opinion…"(P7). P7 is either suggesting that credibility doesn't exits in these contexts or that one's own opinion is inherently credible in these subjective contexts. P17 did not believe credibility was as important in leisure as with other topics: "I think out of all of those, leisure might be the one that you don't really need to like, find the most credible sources, you can just – it's usually you are looking for ideas…" (P17). Participants sometimes made the case that credibility in leisure information was not as critical by comparing it to academic contexts: "Credibility for leisure…here I think it's not as strict as in an academic sphere so you have some feedback and it may not be serious" (P8).

The emotions associated with leisure information were descriptive of these attitudes regarding leisure information. As we noted, leisure information inspired positive emotions. For example P1 admits that his excitement when researching an upcoming trip to New York may have influenced his credibility checking, leading to less restriction about what sources/information might be credible:

> **P1:** When I feel excited to go, sometimes when I'm just feeling sad, and I think of it, "Woah, NY I have spare time, let me just check out what's popping," so yeah, I usually do it when I'm feeling excited about going there, that's when I usually do it, yeah.
> **Investigator**: Do you think that excitement influences what you are looking at?
> **P1**: Possibly, possibly it does create like a certain bias, I tend to be more open to stuff, so I get pleased easily when I'm in that mood.

In general, whether people checked the credibility of leisure information or not, they admitted that stakes were lower, and therefore credibility was either subjective - related to pleasure or agreeableness – or not a factor at all when looking for information. There were notable exceptions, as in the case of some hobbies, and when stakes are higher, as with an important trip or night out. These situations were often also associated with stress or anxiety. In this quote, P17 explains that she has to check the information very thoroughly about where she is going to go eat otherwise it can be very stressful for her: "I know that if I don't prepare before I

go out, I'm going to be anxious, but if I do prepare before I go, I'm not going to be anxious" (P17).

4.3.8.5 Academic Information

Academic information contexts were similar to news contexts in terms of emotional valence and whether emotions were integral or incidental. The majority were negative (68% - Figure 20) and integral (66% - Figure 21). However, incidental emotions such as stress and worry were strong influencers of credibility checking in relation to assignment due dates, another situational factor we will explore below.

Skepticism/doubt emerged as the top emotion, was typically integral, and played an enabling role in credibility checking (see Table 8). P11 shows serious soubt about an article her friend sends her in relation to her field of study that compels her to look for a better source:

> Yah, they sent it through message, and I was able to then say…it was easier to say privately, "I think this is B.S." And I tried to look for it, but all I could find was the same source finding one tooth, or a couple of teeth. So, it was basically just a discovery of a tooth that someone had then taken and written an article about – and multiple sources had written articles about this, about a 'Giant Shark' but it was really just a tooth that had been found. (P11)

P11's feeling of skepticism coupled with her interest in the subject matter compelled her to search through several other sources to find a corroborating story for her friend's article.

The second ranked top emotion in academic information was excitement, which typically was incidental, related to the area of study. P10 states that his excitement about an academic topic led to less concern about credibility checking because he just wanted to get as much information as possible:

> …there are topics that I thought would be really cool ideas, so that I look into it, and when I find that oh someone else is researching on the same thing that's being developed, I get excited that it's a thing. …when I was researching that, I didn't really

> think about it, I was just trying to find as much information as I can about what's been going on in this field. As long as they came from a university website, then to me that's automatically credible. (P10)

P10's excitement about the topic influenced his use of a heuristic, the trusted university platform. This way, he didn't have to perform time-consuming credibility interactions could let his excitement drive his need for more information.

Another incidental emotion of academic information was stress, which was often felt in relation to the judgement of the professor/teaching assistant or in relation to an upcoming deadline:

> Yeah, that anxiety actually made me, like…the amount of credibility, like, I'd disregard credibility somehow, or I wouldn't give it much importance in that case, if it's an assignment which I need to really finish I'd just take off anything that looks even the smallest bit of credibility. (P1)

Stress nearly always resulted in restricted credibilty checking or the use of heuristics.

In the case of academic information, most participants tended to check credibility very thoroughly, most often because of the *importance* of the situation. We found that participants referred to their more rigorous checking of credibility as 'academic' type checking, even in other information topics, such as leisure: "…since I'm more skeptical I'm very aware of what website it came from, uhm…and it almost becomes an academic thing; I'm checking what are your academic sources, those things that you just said" (P10).

4.3.8.6 Other Situational Factors

In addition to the four information topics, six other situational factors related to context emerged from our data (see Table 9: Situational factors ranked by occurrences then number of participants with Top associated emotions). These were not distinct from the information topics but emerged in association with various information topics. Situational factors were grounded in the data and emerged naturally from the reported narratives or typical behaviour, although we based them on Hilligoss and Rieh's definition of contextual factors: each factor either

restricted or enabled the process by which credibility was checked. Emotions associated with situational factors were overwhelmingly negative (see Figure 22). They were also fairly evenly split between integral and incidental emotions: importance, information overload and lack of information/sources had higher integral emotions and importance, urgency and convenience had higher incidental emotions (Figure 23). This may be explained to some extent by the fact that lack of resource or overload of resources would occur during searching and checking credibility, although this does not explain importance. Convenience and urgency characterize the situation leading to the checking, explaining the higher incidental emotions; current political climate was split evenly, perhaps because news information was more often encountered rather than searched for, but political viewpoints are something that are also external to information searching. Below we explain the top 3 of the 6 situational factors in detail and summarize the remaining 3 in the final subsection.

Table 9: Situational factors ranked by occurrences and number of participants and top associated emotions.

Situational Factor	Occurrences	Number of Participants	Top Associated Emotion(s) w/ Occurrences (in brackets)
Importance	69	16	Interest (5) Stress (4) Disgust (3)
Urgency/time constraint	43	16	Stressed/desperate (7) Frustrated (4) General Bad (3)
Convenience	33	13	Frustrated (2) Suspicious (2)
Current political climate	14	10	Afraid (2)
Information overload	14	7	Stressed/desperate (3) Afraid (3)
Lack of information/sources	13	8	Stressed/Desperate (3) Frustrated (2) Disappointment (2)

Figure 22: Comparison of situational factors by emotional valence

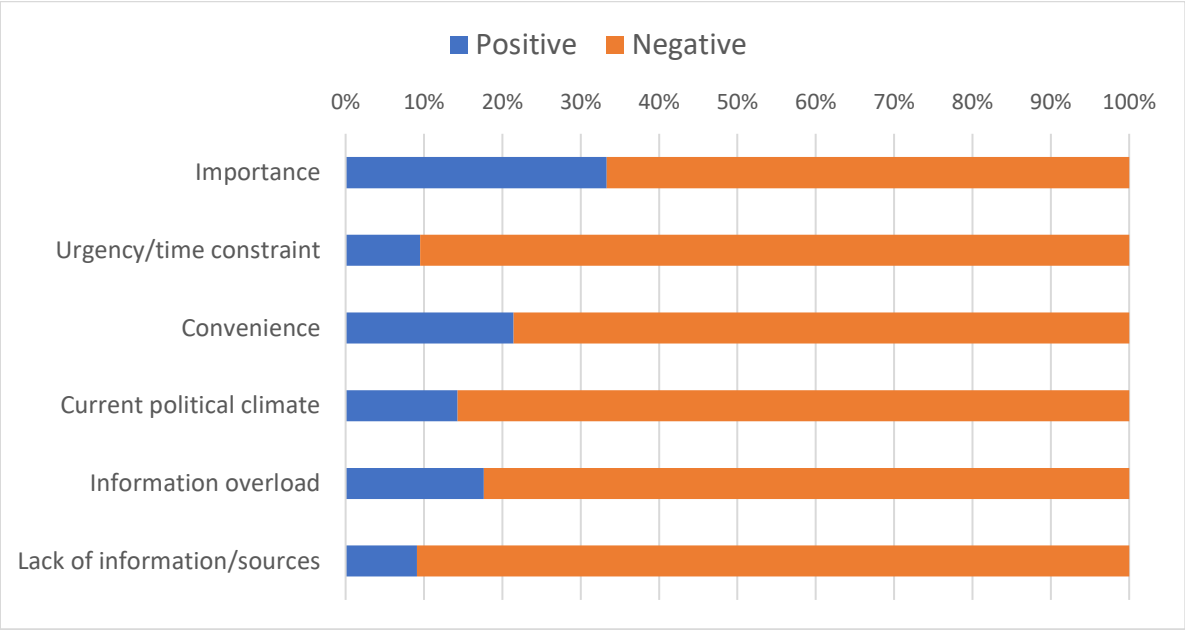
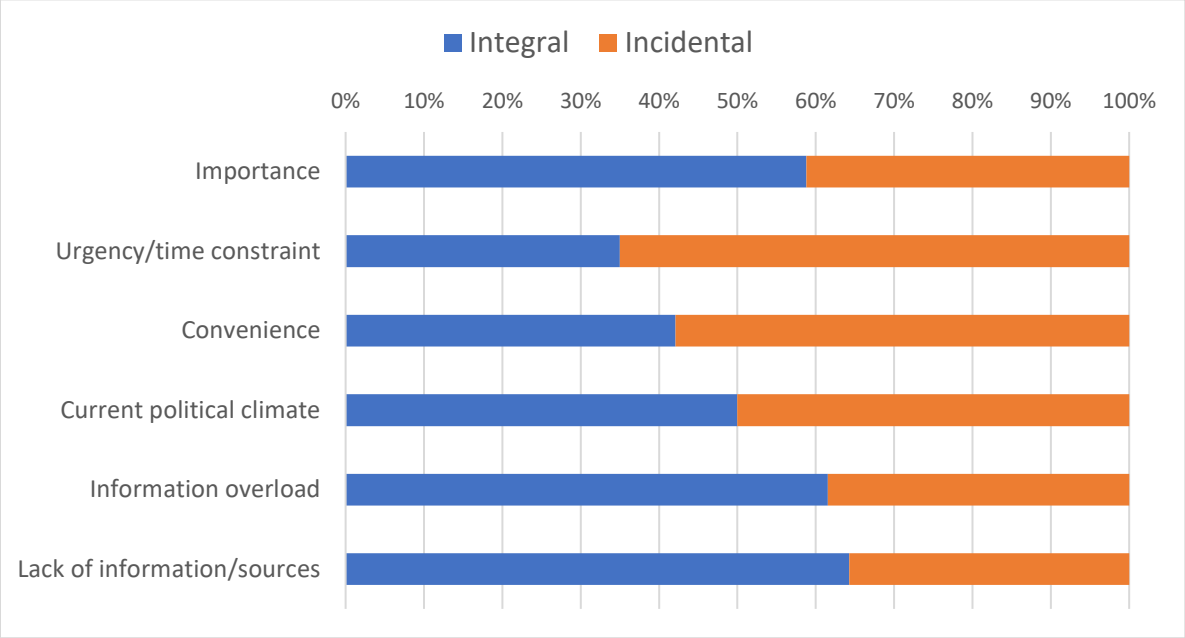


Figure 23: Comparing situational factors by integral and incidental emotions.



4.3.8.6.1 Importance

Importance related to how important the situation was considered to be that led to the information need. Importance was associated with frustration, interest, and disgust. Importance in most cases enabled a more rigorous credibility check, in order for the user to be

more certain about the credibility. Just as with the information topics, emotions were influenced by the context, and in turn influenced how credibility was checked. Figure 22 shows that importance had the highest positive emotions of the situational factors (33%), mainly due to the feeling of interest inherent in important topics. Participants felt that the consequence of getting poor information, particularly in academic or health topics, was too high stakes not to do a thorough check of credibility:

> I think I would look more for credibility depending on the importance of the information I'm looking for. So, if it's for something that's just for my own pleasure, I won't mind too much, because it doesn't have as much negative impact if the information is not true. But for things that are for school, or things that I'm going inhale, like eat…I'm going to want to know if it's good information. (P16)

As touched on above, participants indicated that leisure information does not have the same degree of importance as other three information topics, and did not always require the same level of credibility checking. However, this depended to some extent on the emotion that was elictited by the situation – hobbies were usually associated with interest, which was a motivator of credibility checking.

P9 reports that the concern (caution) evoked in looking for information about important events, such as moving, would coincide with a more rigorous crediblity check: "**…**I'll defintiely be more cautious about it [moving out]. Maybe even more closed. As opposed to just, like, 'yeah sure.' When it comes to things like that, I usually try to get all the options in front of me and compare each one" (P9). P9 uses the term 'closed,' which seems to refer to the tighter credibility checking or being more selective, whereas 'open' implies a more blasé attitude toward checking. His concern seems to be helpful in this case in enabling a more robust credibility check.

In other examples of importance, emotions did not always support better credibility checking. Here, P12 is explaining that he would do a quick check on his phone rather than go home and do a more thorough check on is computer: "I'd probably just check it on the spot, just because I

get a little panicky about that kind of thing, I'd be like, I want to know all the information like, now, and make sure" (P12). We see that situational factors influence credibility by influencing the kind of emotions being felt, although this is not always consistent. Importance can elicit helpful emotions like concern, or less helpful emotions, like stress or desperation. In this example, P4 completely avoids online information if he feels his health condition is important: "If there's anything serious then I think I would be more inclined just to go to the doctor" (P4). There is no explicit mention of emotion here, but we might conjecture that he hopes to avoid the difficult emotions of uncertainty and fear of trying to self-diagnose online by going straight to a trusted source for information about something that important.

4.3.8.6.2 Urgency/Time Constraint

Urgency was associated with the most negative emotions out of the situational factors (90% - see Figure 22), including stress/desperation, frustration, and a general bad feeling (see Table 9). However, as opposed to importance, urgency almost always restricted credibility checking. Participants reported doing the least checking needed to satisfy the requirements of the situation:

> …when I'm really stressed or something I won't take the time to read through the article and look at their methodology and this kind of stuff, versus when I have more time, then I'm not as stressed, more relaxed, I will take more time to verify those things. (P16)

Some participants applied strategies to circumvent the problems of finding information in a time crunch, as shown in the t*rust bank* from The Heuristics Level and Emotion (4.2.5). P5 avoided the online information searching altogether and instead consulted someone in person: "If I can find someone in person who I can just bug and ask all the questions I need then it kind of reduces the time I spend online trying to find the perfect kind of [source]" (P5). In this way, P5 deals with the stress of the time constraint by 'saving time' through a more direct (and presumably trusted) source.

In one case, urgency came into conflict with importance. P7, who was studying medicine, explained that although his clinical work required quick judgements (urgency), the importance of accuracy and reliability outweighed the need to be quick:

> …speed of access is a big one. If I'm responsible for a patient, there's like an added level of 'I need to get this right' which means credibility becomes more important. So while I could get away with just reading something off Wikipedia on an academic assignment – I wouldn't cite Wikipedia, but, using that as my knowledge base – I couldn't get away with that in clinical work. (P7)

In P7's case, the conflict occurs between his concern about making a mistake and pressure to make a quick decision. In our theme of Managing Emotions, we discuss conflicts of emotion and how they influence credibility judgements.

4.3.8.6.3 Convenience

Convenience referred to the situation requiring a convenient solution to getting information and had more negative emotions (79%)than positive, although more positive than most other situational factors (21%), with the exception of importance. Top emotions included frustration and suspicion (Table 9). Participants often reported negative emotions about the credibility of the information that were overridden by the desire for convenience, restricting the motivation to check credibility. P10 reported choosing news sources based on how easy they were to access, despite his doubts about the credibility: "…all the social media has news built into it. They're pretty shady, I know they are pretty shady, but since I'm on those websites anyways, they come up and that's my immediate source for it" (P10).

Convenience provided an interesting dynamic in relation to personal health information: multiple participants admitted that they would choose less credible information online as a quick fix, which was motivated by stress, over the inconvenience of having to see a doctor:

> I don't really want to go to the doctor's office the next day, I'd rather just try to solve it myself quickly. And it's like, I know in the back of my head that obviously there isn't just some quick fix to everything, like I should probably just see a doctor sometimes instead

> of being, like, "oh how do I cure my cold in five seconds," because like, nothing online is actually going to do that for me (laughs). It's just I think I have a little bit of an impulsive nature with those things, just because it frustrates me, because there is nothing I can do about it. And uhm, so I resort to going with the quickest fix, which seems wrong to me anyhow. (P12)

The need for answers as well as for convenience represents a noteworthy conflict in health information, one that may be further explored to understand why so many use online health information even when they admit that this information is not likely to be credible or helpful.

4.3.8.6.4 Current Political Climate, Information Overload, Lack of Information

Current political climate was mainly associated with negative emotions (86% - Figure 22), dominated by fear (Table 9), and balanced for integral and incidental (50/50% - Figure 23). Several participants explained that the *current political climate* compelled them to look more deeply into credibilty of their news sources out of fear, and made them more vigilant of bias while checking:

> Currently, of course, there's a lot going on in the world at times, I feel like it's better to keep up and know what's up, know what's going on as opposed to just living in like, shadows, and carrying on with your daily life, cause I don't think that's how it should be. You are just more fearful. So, you have to know what's going on. (P5)

Current Political Climate could also restrict credibility checking. Participants expressed a desire not to check credibility of other users' political views online because this required engaging with them, a task which some found too negative in terms of their own emotional experience: "Yeah, I find that that's how I get through times like this, by not engaging. Just keeping my head down, working with things that are important, that I think will improve, as opposed to focusing on all the bad" (P11). Fearfulness about the political situation and avoidance of the information itself supports the even split between incidental and integral emotions shown in Figure 23.

Information overload was associated with stress/desperation and fear (Table 9), particularly in relation to academic and health information, where stress levels are often already high. These emotions tended to restrict the amount of credibility checking, leading to confusion and an inability to make credibility decisions:

> …there's so many different opinions, and I guess the feeling is, like, overwhelming, especially when it's like something personal that you are trying to figure out, and like anyone can put anything on the internet, so it's kind of hard to hone in on what's real information or like what will actually help. (P6)

Emotions were majority negative (82%) and integral (62%), relfecting the process of searching for information and being overwhelmed by the amount of information available to be checked.

Lack of information had the highest negative (91%), integral emotion (64%), possibly due to searching for and checking credibility information and not finding it to be good enough. Lack of information could refer to lack of information sources, or in some cases, a lack of useful cues about an information source (e.g. missing author, date). This restricted opportunities for credibility checking, leading to frustration and desperation, which forced participants to choose sources without being sure about credibility: "It was just, like, guys we really need something quick here, so…we need to come up with something, so...if this is the only article that's there of that company, you might as well go with it" (P1). On the other hand, a lack of alternative sources required participants to look into a source they would have otherwise discarded: "it's like a really narrow topic and this is just one of the only sources I've found, I might go digging deeper. But if there's a lot of other sources I can go to, I might just discard it" (P4). In this way, lack of sources also motivated more credibility checking.

4.3.9 Context and Emotion - Summary

On the whole, we found that information topics and situational factors enabled and restricted both in terms of source selection as well as credibility checking itself. When examined, the particular emotion elicited in association with these factors that was playing a key role in enabling and restricting. Although we did not have enough data to find strong patterns, we

found some consistency between whether context enabled or restricted credibility checking activities and the associated emotions found in those contexts. For instance, stress nearly always led to restricted credibility checking, whereas suspicion, skepticism and interest nearly always led to more checking. Some emotions, such as excitement and fear could enable or restrict depending on which situational factors are involved. For instance, the excitement felt about a leisure topic may make a user gullible, unless the topic is very important, in which case it may make the user check more rigorously.

We found that incidental emotions in credibility were part of the context, often related to the original reason for the information need. These emotions were external to the credibility judgement but nevertheless restricted or enabled subsequent interactions with emotional cues and the use of heuristics, such as trust banks (Figure 24). In our discussion, we look more closely at the role of context, as well as the other components from the framework, in terms of the prevailing research on emotion and credibility, in order to situate some of these findings.

4.3.10 Themes external to Hilligoss and Rieh's Framework

We found three themes that did not fit into Hilligoss and Rieh's Framework but were nevertheless important in answering our research questions: *Emotion as Helping or Hindering Credibility Judgements*, *Bias, Balance and Synthesis,* and *Managing Emotions*. The themes have some overlapping aspects and give a more holistic view of how emotion is influencing credibility judgement. Emotion as helping or hindering comes from a direct question asked of our participants toward the end of our interviews to understand how our participants themselves perceived the role of emotion; we also found evidence this theme indirectly when participants were describing their credibility checking processes throughout the interview. Bias, Balance, and Synthesis emerged in discussions around dealing with opposing viewpoints and echo chambers. Managing emotions emerged when participants discussed how they dealt the emotions when they were perceived to be hindering credibility decision-making.

4.3.10.1 Emotion as Helping or Hindering Credibility Judgements

The objective of RQ2b was to understand whether undergraduates felt that emotions helped or hindered their credibility judgements. We asked our participants that exact question toward the end of our interviews; our analysis included these responses as well as any responses acknowledging when emotions helped or hindered credibility judgements anytime during the interview. Responses to the direct question were often split, with some citing they felt emotions helped, while others felt they hindered, and a few claimed both were possible. Our analysis found that the influence of emotions when they helped or hindered could refer to the informational or motivational aspects of checking credibility (see Table 10).

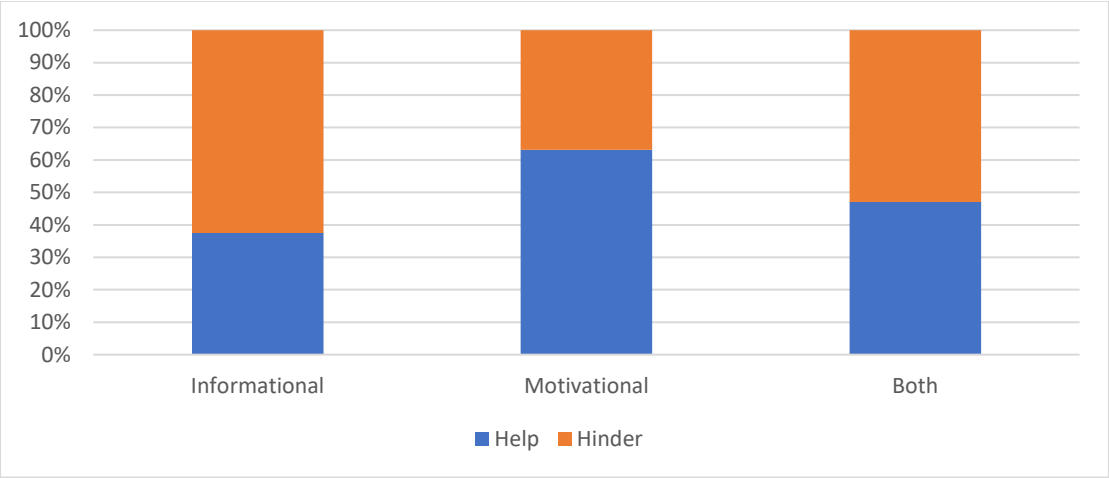
Table 10: Summary of reporting about whether emotions help or hinder credibility judgements

	Hinder	Help	Total
Informational	20 (62.5%)	12 (37.5%)	32 (100%)
Motivational	7 (36.8%)	12 (63.2%)	19 (100%)
Total	27 (52.9%)	24 (47.1%)	51 (100%)

We clarified how emotions could influence credibility judgements by either providing information that was integral (in the case of interactions with cues or heuristics) or incidental (emotions that came out of the situation but were irrelevant to the credibility of the information in the subsequent search). We found that, while incidental emotions provided information that was irrelevant to the credibility, they often also provided motivation for the search and for credibility checking.

Overall, responses were divided fairly evenly as to whether emotions helped or hindered credibility judgements, slightly more reports of hinder than help (Figure 25). *Informationally*, responses showed a tendency for emotions hinder credibility judgments rather than help, while *motivationally* they tended to help rather than hinder.

Figure 24: Comparison of whether motivational and informational emotions helped or hindered



Informationally, participants reported that emotions helped credibility judgements when they were related to their previous experience or were associated with trusted sources:

> I think your good or bad feelings, when they come from previous experience, they really help you with credibility and judgement and stuff, and then even when your base, you can base your feelings off new sources, credible or un-credible sources like, they give you a feeling for the next time you see it, you know yes, I click on it, or no I don't. (P2)

We can see in P2's example that her emotions relate to her previous experience, reminding her that a source was good in the past, so it is worth trying it again; a bad emotion in the same situation would give the opposite information, demonstrating a key role for emotion in providing important credibility information about a previous source.

Participants reported that emotions were a hinderance informationally in reference to quick reactions based on little or no other information: "so an unexperienced user may rely solely on his or her own feelings, and well, just reject or accept resource without doing some kind of research" (P8). Emotions also biased informationally when they influenced which cues are seen or missed; P8 seems aware of this kind of influence from incidental emotions from mood or external situations:

> If I'm, like, researching for a paper I'm writing, and…uhm, I get like a negative feeling from a source it might just be because…it might because of like, other things that are happening in my life or whatever, or I might be going too quickly and miss some good information or I might be feeling like I can't read critically, and I might miss important content…. Being tired…or, like, really busy…or… not wanting to do it at that time or something. (P8)

Emotions also hindered credibility judgments when they arose from a bias for or against certain perspectives, restricted participants' ability to consider cues or criteria:

> I think when I'm doing research and I'm looking for academic resources and I have an hypothesis in mind, I'm like, "I want my hypothesis…I want what I'm writing about, what I'm reading about to reflect what I'm thinking and what I'm hoping to find." So that is a feeling, of wanting to find that. Yeah, and I guess news as well, I'll probably, if I want to hear something bad about somebody, I'll probably look at the bad stuff more than the good stuff. (P17)

P17 admits to a certain confirmation bias in both academic and news topics, where he considers only information that supports his hypotheses. We discuss bias and confirmation bias in more detail in a subsequent subsection.

Motivationally, results were flipped, with participants reported that emotions somewhat tended to help (12) as opposed to hinder (7) credibility judgments. Emotions helped when they compelled participants to continue reading or checking credibility: "…if I particularly disagree, or if I particularly agree. Or if it's just a subject that's interesting, I'll read it to the end" (P4). P4 reports both positive and negative reactions will compel her to continue reading, rather than leave or avoid the source. This was the opposite for those who reported that emotions hindered them motivationally. P9 reports that his emotions may hinder his credibility judgements because of their influence on whether he moves towards or away from certain sources: "if I shy away from it and it turns out it is credible, that's not great, and if I move towards it and it turns out it's not credible, that's also not great" (P9).

A situation that seemed to fall between informational and motivational in our analysis of helping and hindering was when participants reported leaving a source without reading or continuing to check credibility. Emotion here told participants both that the source was not good and to leave, which seems to capture both information and motivational aspects: "I don't have a good feeling about that website for x, y, that means this website, I won't get into that website. I won't get into that source because I can't even look at it and not laugh or something" (P13). P13 has no motivation to check into a source any further because of the information he gets about its quality from the presentation.

A number of our participants were split on whether emotions helped or hindered credibility judgements, showing a nuanced understanding of how emotions may be influencing judgements, from the perspective of their informational and motivational influence, valence, or the information topic. In a continuation of the quote above, P9 contradicts himself, showing he is not sure whether the same emotions might have the opposite effect with credibility: "But then again, I could be shied away from a bad one and go towards a good one, so it's kind of a balance there" (P9).

Multiple participants' answers were nuanced by information and motivation. P13 feels that emotion can help motivationally, but hinder informationally: "It's helping me to find information for sure, but it's not helping me to know if it's the right information, I guess" (P13). Here P18 also claims that emotions can help motivationally, but bias what cues are considered:

> On the one hand, yes it does drive me to search for more information, but on the other, it means that I'm not necessarily looking for the most information, right? Like, if I were completely unbiased and just read everything, I think I would know more about more topics. So, like by using my emotions to discriminate against what I read, I'm cutting out information that I could otherwise have. (P18)

P10 further nuances this by valence: "When I feel bad about a source, it helps me to investigate what to think about whether something is credible or not. Because when I feel good about it, it's agreeing with whatever I'm thinking of, then I tend not to think about credibility" (P10). P10

admits that it is usually negative feelings that motivate checking, while positive feelings tend to reinforce a confirmation bias.

Some participants reported that emotions could help credibility judgements depending on the topic: "I think in academic sources it can hinder because you should be more, like, when you are looking at academic sources it shouldn't be so much a feeling as really based on content, but I think it's a positive thing in any of the other situations" (P6). P6 was only concerned about emotions hindering in academic situations, a finding reflected in our results in the information topics subsections of Context (4.3.8).

One participant seemed aware of the role of incidental emotions in motivation and reported that this could be both helpful and hindering, depending on the information topic:

> Like, if you are in a bad mood, you look at something, you don't really care anymore, you are just going to take it and be done with the assignment, you just want to put it in your project and be done with it. So, it kind of affects the credibility. So, for leisure, it can affect in a good way, like it can hype you up or something. So, I guess it works in both ways. P14

The interview question about helping or hindering was fairly general and did not get into to many details, so it was difficult to know what kind of emotions participants had in mind. However, it was sometimes clear from the answers which valence, and whether emotions were incidental or integral. We note that incidental emotions were helpful when they motivated credibility checking, and that integral emotions hindered when they were in response to peripheral cues but helpful in response previous experiences.

Although there appeared to be some consistency as far as whether emotions helped or hindered credibility judgements, responses were nuanced based on multiple other dimensions; much more evidence is needed to theorize any further. However, our themes of *Managing Emotions* and *Bias, Balance and Synthesis* help to further describe how participants awareness of some of these motivational and informational aspects of emotions impact their ability to judge credibility.

4.3.10.2 Bias, Balance and Synthesis

Participants reported bias as influencing their credibility judgements in several interrelated ways: some reported rejecting or avoiding sources they perceived as biased or accepting or seeking out those perceived as balanced; some reported overly scrutinizing information that disagreed their own opinion or accepting information or sources that they agreed with over ones they did not (confirmation bias).

The rejection or avoidance of sources perceived as biased was quite common, represented by one of the top criteria (objectivity/bias) of credibility; emotion was often associated with detecting bias. P18's strong, negative language about sources he sees as bias shows a visceral emotional reaction: "I have a bad feeling about CNN. CNN is garbage. The NYT, I've read it enough to know their formula, which is the one third is the facts, and the rest is just them editorializing" (P18). On the other hand, participants also preferred sources or information perceived as balanced or free of bias (objectivity) that contained either facts or multiple perspectives. Few questioned whether they were, in fact, able to determine whether something was factual or whether a fair representation of other viewpoints was being presented. We look at this in more detail in the subsection Balance, and Synthesis.

It was more difficult for participants to recognize their own bias, which was expressed as preference for one's own opinion or rejection of other viewpoints. P18 shows bias toward a certain viewpoint, but seems unaware of it:

> I started out just by Googling 'what causes the gender-wage gap?' Ok, it's this and this and ok, it's discrimination – of course it's discrimination, whatever…and there's one of the options which was, like, "Gender-wage gap is a myth," and I was like ok, try that. And they put out their arguments and I was, like, "Ok this one makes sense, this one makes sense…this one maybe not so much." And then you look into it a little further, and then you look a little further. (P18)

While actively seeking other perspectives is good for developing a critical point of view on a topic, P18 appears to presume more credibility in the one outlier than in the information that

has been corroborated in many sources, with no strong rationale for his choosing the outlier over the others.

In contrast, P7 was able to reflect on his own bias and its influence on his ability to carry on a reasonable debate about one of his hobbies:

> In my mind I was saying "wrong, wrong, wrong, incorrect, false." I was looking for ways of how they manipulated the truth. I felt like a sense of anger…you know when you get riled up, uh…yeah…like a debate on the internet where some person is just completely different from you. Uh…like a polarized debate. It wasn't even… "I can see your point of view," it was just beyond that…so yeah, like anger…yeah. (P7)

Again, emotion – in this case anger – seemed to play a key role in blocking his ability to engage with another point of view.

In our Construct subsection on Credibility and Agreeableness, we noted that bias and confirmation bias may indicate the use of *agreeableness* as a construct of credibility, which was generally benign in leisure information, but less appropriate in situations where information should be objective and reliable, as with news, health, and academia. P16 describes confirmation bias in terms of 'expectations':

> Emotions – maybe I think too much of it as expectations, so what I expect to find, maybe if I'm happy about something, I expect to find something that will make me more happy about it. Yeah, I think you can have expectations and the expectations can affect what you find, or how you judge the credibility. (P16)

Emotion plays a key role in setting her expectations, with her incidental happiness setting the theme for what kind of information gets noticed. Her response hints at the concept of mood congruence, which we address in our Discussion Chapter.

Like context, bias can restrict *and* enable credibility checking: P7 describes how bias drove him to first avoid anecdote-driven information, but regular encountering of similar stories on his Facebook feed convinced him to regard the information as credible:

> I wanted the data-driven one to feel more credible than the anecdote-driven one …I would, like, try to find ways to reduce the credibility of these anecdote-based websites. I think I did...I would look harder for holes in their arguments. I would say "that's just an anecdote…why don't we look at data?" Not knowing…well…not considering that stories can also be data. So I guess it would be judging one website more harshly than the other, when I should judge both of them equally. (P7)

In the case of P7, his drive to further check these stories led him to conclude that they were equally valid to the data-driven information, and eventually changed his perspective. This will be touched on again in the subsection 'Managing your Emotions.'

Bias and confirmation bias also seem to act similarly to heuristics, because they allow for quicker judgements of credibility; this process is also often supported by emotions. P13 explains that his feelings may tell him that one position is true when faced with two points of view, without investigating in detail why one is more credible than the other:

> It's like saying I'm vegetarian because one of the reasons is I feel it's more environmentally friendly. Then, like, some research paper are [sic] proving it's not necessarily true, but some are proving that it's true, but since I feel like it's true, I'll just follow it based on "well, I know that this information told me that it was true, so I'll just follow this one even those this one is saying it's not true." (P13)

P10 describes a kind of confirmation bias when looking for health information online; his suspicion and uncertainty tells him to consider only information that confirms his diagnosis, ignoring other information that might tell him otherwise:

> …definitely there's cases where sometimes, when I think I have something, I look at the symptoms and I find just one website saying, "oh it could be this." And then … you already thought…you already suspected it. …I guess it just makes me biased because I know at the same time there's a bunch of other sources saying that it could not be what I think it is, but because I already think what it is – like, I don't know for sure, I never tell

> myself "this is for sure," but again, it's just a hunch that reinforces what my opinions are, and I tend to believe it more. (P10)

P7 is even more explicit regarding how his emotions are giving him information about which of two perspectives he should favour:

> …if I'm reading something I agree with, I always worry that I'm falling into an echo chamber. If I read something I disagree with, I feel like a something inside of me, like anger or…so it's kind of a fine line of what do I read…and it's like reading things that I agree with makes me feel better. And that feeling better triggers me to think, "Am I in an echo chamber, and I'm just reading things that I agree with?" (P7)

P7 shows level of awareness about his bias that has helped him to reinterpret the information his emotional cues are giving him; rather than assuming his good feelings indiciate credibility, he understands they may indicate bias, and that he needs to be vigilent.

P15 also shows some understanding of the emotionality involved in considering the credibility of information outside one's own perspective:

> …sometimes I think it's important to veer off of that and say "ok, why are they so adamant about this other perspective that isn't my own?" and try and see if it affects my own or confirms my own. Sometimes it's…it feels kind of grimy to do, and it's, like, "Oh, I have to read this," or "I'm going to have to sort through this entire article." But I do feel like it's important. (P15)

Again, we see a reference to the role emotion plays in confirming or denying one's point of view, and the need to work through difficult emotions to gain insight. We explore this more in our subsection on *Managing Emotions* (4.3.10.3).

4.3.10.2.1 Balance and Synthesis

Most of our participants reported preferring information that was presumed to be balanced in its approach. While there are some clear advantages to reading only balanced information, there are two ways in which doing so was problematic. First, our participants made the

assumption that one can easily judge a 'balanced position,' when, in fact, confirmation bias may be leading one to believe that a biased perspective is balanced; second, the preference for balanced perspective is often accompanied by a strong emotional aversion to unbalanced (biased) views, particularly those from the opposite perspective of one's own. Participants stated they felt anger towards information sources they perceived as biased and would avoid these sources: "I have strong feelings about Fox News, just to the point where I don't deal with it because it seems, seems so wildly incredible to me, that I just, I just wouldn't even bother" (P12). To avoid these kind of negative feelings participants would seek out sources that *pre-processed* information for them into what they percieved as balanaced perspectives. The tendency to look to others to process ideas and deliver a product considered to be unbiased can be seen as an 'outsourcing' of a key information competency - *synthesis* - and may lead to students being unable or unwilling to do so themselves. P15 explains why he looks to Philip DeFranco as a trusted source for balanced news:

> … he gives you the story, he'll give you both sides, and he'll say, "ok this is my opinion," or "this is where it get's a little bit biased." He doesn't not have an opinion, but he says, "if you are going to make a judgement, make it now, before I start to make my spiel." So I'll look for things like that where it's not super one side of the issue or super the other side. More like, "here are both sides, and maybe here is a spin on it." (P15)

The critical thinking and synthesis of an issue seems to be performed by DeFranco for his consumers. It could be argued that outsourcing synthesis may lead to a gap in the ability to judge for oneself what is biased and what is balanced. This is especially an issue if the avoidance of information perceived to be biased comes from emotional cues and not a more robust process of credibility checking.

There is a good rationale for the outsourcing of synthesis, in which emotion is a factor. P7 describes how emotionally draining it is for him to try to synthesize two points of view on an international conflict: "My feeling is like one of hopelessness, it's like I'm never going to get through to the bottom of this. How would I know who is actually correct, morally correct in this conflict. There's no way for me to use news sources in order to come to that conclusion" (P7).

This statement makes a case for finding a trusted source that has pre-processed information for the user as P15 has done with DeFranco. It also reinforces our finding about 'trust banks,' which play the same role of saving one from having to deal with difficult interactions.

We found that emotion could also enable synthesis. P9 explains how feeling skeptical about all sources helps him to approach all kinds of information, with the intention of synthesizing it for himself: "I just kinda, like, take absolutely everything with a grain of salt and then piece it together on your own. Because it's hard to find a completely neutral source of news…" (P9).

In the same vein, participants also described having an 'openness' to new ideas or giving the 'benefit of the doubt' to certain points of view. When looking through movie reviews, P9 likes to keep an open mind so that she can learn something:

> Yeah, I guess I would try to see why people enjoyed that thing, and to see if I could, kind of like, agree with it or disagree with it….Just you know to have a discussion, or maybe I change my mind and end up liking it, or maybe I change their mind and they end up not liking it. (P9)

Being open to new ideas or overcoming negative emotions from first impressions led to participants gaining new insights and developing a more robust ability to synthesize. Both approaches implicated a competency with *managing emotions,* which we present in the next subsection. The process of overcoming one's own bias or negative feelings about a source was uncomfortable and required a conscientious drive to be open to new ideas: "…it was like trying to get rid of this feeling of discomfort, I would try to change the credibility of one versus the other…I wanted a new perspective, and I didn't want to be in an echo chamber" (P7). P7 describes the emotional barrier to changing one's perspective and hints at the need to manage these emotions to get past that barrier.

4.3.10.3 Managing Emotions

Even when experiencing strong emotions or bias when interacting with information, participants reported that they were sometimes capable of managing their emotions in order to

be able to check credibility: “Yeah, I think if you keep reading something and you are, like, learning from it, and the information is relevant…uhm…you can push past previous feelings that you didn’t like it. And, like, then you can have positive feelings about it (P6).” P6 is describing a process of overcoming an initial negative emotional response in order to look more carefully at the information, and consequently experiencing a positive emotion. This supports our finding (described in the Interaction section 4.2.3) that some intial reactions are not in themselves credibility judgements, but just reactions to cues. Participants described managing emotions in response to specific criteria participants did not like, or found to be suspect in some way, such as quality of language or website design:

> …funny enough, the really good academic websites tend to be ugly, I don’t know why, it’s just a trend. Sometimes I’ll just, like…I notice it sometimes because I’ll see a website and it’s orange and green - maybe not orange and green, maybe just beige and boring – and I’ll see it and just be, like, “uhg,” and I’ll click away and I’ll search for a bit and then I’ll end up on the same website and I’ll be, like, “Ok…let’s read it,” and you read it and it’s actually good information. So that’s the part where I’ll say, “Ok, I’ll take your information and your material over that.” But a lot of the times had I clicked away from that and found something else that had a better presentation and maybe the same then I would have gone for that, so. It could have got in my way. (P5)

P5 recognizes that his emotional response to the website design was hindering him from finding good information in some cases. The situation, however (lack of sources), forced him to overcome his distaste and read further, ultimately finding credible information. We see here that the context can influence how emotions might be influencing credibility judgements.

As we saw with P6, the experience of managing emotions could be transformative, with participants reporting the benefits of being able to deal with initial strong reactions in order to discover credibility in unlikely places. P15 makes a point of pushing past her ‘grimy’ feeling to get another point of view: “Sometimes it’s, it feels kind of grimy to do, and it’s like ‘oh, I have to read this,’ or ‘I’m going to have to sort through this entire article.’ But I do feel like it’s

important" (P15). P8 sees her 'intial feeling' as something to push through, anticipating a possible learning experience at the end:

> Well, initial feelings, ok you might understand the initial feelings - what they force you to do, to reject the website, for example if talking about the website - to reject it as not trustworthy. Well, in that case always do some – just read the post twice or three times, how many times you like. Because you might actually digest the information. And when it's digested, your perspective might change. (P8)

Rather than needing to ignore emotional information altogether, emotional information became part of the learning process.

Initial emotions that needed to be 'managed' were not always negative. P16 describes the management of her excitement, an emotion which we have shown can sometimes hinder credibility judgments: "Often if I read the title of it, and it's something exciting – I'll put my excitement on hold before I see if it's true or not. And then if I read it through and I trust the credibility is valid, then I will get excited" (P16). P16 putting her excitement 'on hold' allowed her to perform more measured credibility checking, before her excitement told her to believe the information. Managing emotions seems to be playing a key role in learning to appreciate other perspectives, with possible implications for IL education.

4.4 Results – Summary

We designed our study to look for evidence of emotion in credibility judgements, using a theoretical framework that conceptualize multiple aspects of credibility and credibility judgement as well as emotion and decisions-making. We found evidence of the influence of emotion to some degree in many aspects of credibility and credibility decision-making, demonstrating the importance as well as the extent to which emotion should be considered in future credibility research.

We found that emotion was ubiquitously reported throughout our interview data, and counted as a criterion of credibility, both on its own and in combination with other criteria. At the

Interaction level of Hilligoss and Rieh's Unified Framework, emotion acted as a cue, giving information about information, source, or platform. It also emerged with other 'cognitive' cues, giving information about that cue in terms of its quality, at least as far as the valence of that emotion. Emotional cues also motivated or demotivated checking of credibility. At the Heuristic level, emotions were key components of heuristics, encoded into a rule with a rationale and credibility construct, providing quick and easy judgments of credibility. At the Construct level, emotions were part of the overall credibility decision, giving a 'feeling' to judging credibility. Emotion was implicated in the construct of agreeableness, helpful in certain contexts and hindering in others. In Context, emotions characterized both information topics and other situational factors that lead to the need for information; emotions play a key role in how situational factors and topics enabled and restricted credibility checking activities.

Finally, emotion play a key role in other themes that will help to answer our RQs; emotion appears to both help and hinder credibility judgements based on several dimensions, including their motivational or informational role, their valence, the context, and whether they are incidental or integral. Emotion characterizes bias and confirmation bias, influencing whether participants move towards or away from sources, whether they check or don't check credibility, and whether they challenge or don't challenge their own perspectives. And emotions can be managed, demonstrating a possible need or benefit of learning emotional competency.

In the Discussion Chapter we integrate our findings by answering our RQs and sub-questions and discuss how Hilligoss and Rieh's Unifying Framework of Credibility Assessment could be extended to include emotion as an integral part of each component. We will also discuss the impact of these findings on current and future research directions.

5 Discussion and Limitations

This chapter reflects on the findings in order to answer our research questions and sub-questions and where our findings fit into the current body of knowledge on emotion and credibility. The chapter is structured by answering the main questions and subquestions, including addressing any pertinent themes from our analysis. We look at how our findings contribute to the literature we reviewed in Chapter 2, as well as introduce some new literature which helped us to further interpret our findings that was not considered in our literature review originally. The chapter concludes by discussing how our analysis justifies extending Hilligoss and Rieh's Unifying Framework of Credibility Assessment, presenting the argument for emotion to be included in credibility and credibility judgement, and what this might mean for future research in credibility.

5.1 Answering the Research Questions

5.2 RQ1. Is emotion an important criterion in judging credibility?

The question of 'importance' is answered sub-questions RQ1a about the extent to which emotion is reported as influencing credibility judgements, and RQ1b how it relates to other established (i.e. important) criteria of credibility. Importance and extent are also demonstrated in the results of our analysis using Hilligoss and Rieh's framework to show that emotion factors in all levels of credibility assessment, as well as the context in which assessment occurs.

Importance was found in our data most directly based on participants' own acknowledgement of its importance and influence. Participants were asked specifically about whether their emotions helped or hindered their credibility judgements; their responses, which were split, gave some indication as to the perceived importance of emotions: whether emotions helped or hindered did not change the fact that that emotions were influencing credibility judgements, for better or for worse. However, when asked directly about how important "my good or bad feeling" was when judging credibility (based on the survey question), results showed some

variation, with some reporting they were very important and others saying they were not very important or not important at all. Of our 18 interview participants, only one (P3) stated that she *did not* consider her emotions at all when judging credibility, however, throughout her interview she gave multiple examples of times her emotions influenced her judgements throughout her interview. Many of our participants who were asked about the importance of their "Good or bad feeling" reported that it was as important as the other criteria, and that "My good or bad feeling" may also have important relationships with the other criteria, which we discuss further in RQ1b. Some of our participants reported that their emotions were possibly a factor, but that they were not really conscious of them, which may have influenced how important they felt they were. Level of emotional awareness was likely a factor in our study and would be a useful measurement in future similar studies. It also may have been a limitation of the interview that participants did not want to admit the importance of their emotions, if they felt that they may be judged negatively for this. We noted individual differences among our participants' expressions of emotion, with the one participant having only 6 occurrences of 5 discrete emotions, while another had 46 occurrences of 19 discrete emotions; other participants varied between these numbers. This may indicate a reticence to discuss emotions or a different level of awareness of or access to one's emotions while self-reporting.

5.2.1 RQ1a. To what extent does emotion influence undergraduates' credibility judgements of information found online?

One measure of the importance that emotion was demonstrated by the *extent* to which emotion was reported in descriptions and narratives about judging credibility of online information. We coded 33 distinct emotions mentioned by participants during the interviews, showing extent in terms of the breadth of emotional expression. Participants were able to discuss their emotional reactions when checking the credibility of information to varying degrees of detail and clarity. Participants who initially claimed they did not notice emotions during credibility judgements, when probed further reported feelings of relief, satisfaction, and enjoyment after finding credible information, and frustration and anger when information was

judged to be non-credible or biased. Findings suggest that much of the credibility judging process – including emotion - is buried in the subconscious, but that when probed, most participants were able to describe how their emotions played a role in their credibility judgements. Differences in the awareness of emotional influence could possibly be better explored through personality inventories designed to detect emotional awareness or attitudes of openness (e.g. the Levels of Emotional Awareness Scale (Lane et al., 1990)); including one of these inventories would be a good addition to any further study of emotion and credibility. Research employing some of the other methods for accessing emotions other than self-reporting would likely be able to observe the role of emotion outside of participant's own ability to access their emotions – we discuss this in more detail below.

Our analysis of the data under Hilligoss and Rieh's Unifying Framework also suggests that emotion in credibility is extensive as it was detected in all levels of their framework. Emotion is also a factor in the overall context in the form of incidental emotions and bias, influencing credibility decisions and creating conflicts between heuristic and interactive processes of credibility checking. We also found that emotion was a key motivator in credibility checking as well as closely related behaviours, like continuing to search, stopping searching and avoiding. This is not found in the literature on credibility from our review, which usually relegated emotion to a marginal position in the process, including in Hilligoss and Rieh's framework. However, our findings are supported by the literature in IB, which has consistently, albeit slowly, shown a likelihood that affect was influencing behaviour in multiple ways. Whereas extent was not as much a question in IB literature, however, a lack of intricate lens by which to view the credibility decision-making process in order to theorize more relationships among cognitive and affective factors, external contextual factors. This lens be placed into prevailing IB models that include information evaluation and considers a role for emotion: "information processing" in Wilson's model of Information Behaviour (Wilson, 1999), or the 'exploration' part of Kuhlthau's ISP (Kuhlthau, 1991), and Nahl's Social-biological information technology model, which already accounts for the relationship between cognitive and affective factors, as well as a central role for affect in evaluation, although evaluation here doesn't not always mean quality or credibility of the information itself (Nahl, 2007). Our findings are also supported by

Dervin and Reinhard's theoretical thrusts, providing a meaningful application for their theoretical contributions that could be tested empirically in future studies (Dervin and Reinhard, 2007).

Little had been said about the importance of emotion in credibility literature, however, with some mention of affect or emotion in relation to peripheral criteria. We feel that we have made a strong case for future research in credibility that includes emotion as a key factor in credibility decision-making frameworks and models and will demonstrate how this can be done by extending Hilligoss and Rieh's framework to include emotion. The importance of emotion in decision-making was already identified as a key factor in literature from Psychology, therefore, it was not a surprise that emotion would be found to influence decisions about credibility. Studies that leverage more Psychology theory on emotion would benefit LIS and Credibility in developing stronger theory around this.

5.2.2 RQ1b. How does emotion relate to other established criteria for judging credibility?

We already established in RQ1a whether emotion was reported extensively, at least as much as other key criteria, and now we wished to know if emotion was comparable to the other criteria in judging credibility in so far as the information it could provide; we relied on Schwartz's concept of feeling-as-information as a guiding theoretical principle (Schwartz, 2012). The relationship between emotion and other criteria helped to address the question of if emotion is *providing information* by which credibility could be judged, and if that information was considered at all during credibility judgements. Therefore, we answered this question in both a comparative sense – emotion in contrast to other criteria – and in a relationship sense – emotion as part of other criteria.

We examined these relationships throughout the interviews, where they emerged naturally and indirectly as part of the narratives, but also explicitly at the end of interviews, when participants were asked if their good or bad feelings were experienced in relation to any of the other criteria. Many were quickly able to connect their feelings to particular criteria. Those who

were not able to easily connect their feelings to particular criteria also tended to be those who answered that their feelings were subconscious processes.

Participants reported that the strongest relationship was between 'My good or bad feeling' and 'Quality of language,' followed closely by 'My previous experience with a website or source,' 'Quality of images, sounds, and videos,' and 'Affiliation/reputation of author, creator.' An explanation for the stronger relationship between emotion and criteria that are perhaps more 'visual' (such as design elements) may be explained by Hsee's 'Evaluability hypothesis' (Hsee, 1996; Slovic et al., 2006). The Evaluability hypothesis posits that "…the weight of a stimulus attribute in an evaluative judgment or choice is proportional to the ease or precision with which the value of that attribute (or a comparison on the attribute across alternatives) can be mapped into an affective impression" (Slovic et al, 2008, p. 1340). According to Hsee's hypothesis, attributes that do not require a lot of deliberation or external information to evaluate, such as visual element or the quality of language, will map more easily and precisely to an affective value (good or bad). Attributes are also given more weight in a decision because they have a more precise (stronger) relationship with affect, which is giving information about its value *apropos* of the decision. Slovic points out that this can explain why "even very important attributes" may not be considered by a user, since these attributes may not easily be mapped into "an affective frame of reference." (Slovic et al, 2006, p. 1340). This hypothesis explains why peripheral cues such as design, images, and language quality may be considered over other criteria, even while best practices around evaluating information require thorough examination of many cues. The Evaluability hypothesis could help to explain the importance of surface features in Wathen and Burkell's credibility model, as well as Sundar's MAIN model, and even Fogg's Prominence-Interpretation theory (Wathen and Burkell, 2002; Fogg, 2003; Sundar, 2008). It may be that the use of surface features or visual elements of information by users is a hard-wired aspect of cognitive processing. Rather than labeling this tendency as the product of underdeveloped IL skills, it may be more fruitful to find how it can be leveraged by information system designers or IL education developers. Further study regarding the weight of affect on consideration of certain cues would help learners and designers better interpret the

information their emotions are giving them. At the very least, the Evaluability hypothesis gives credence to the idea that emotion is playing a key role in credibility decision-making.

5.3 RQ2. How does emotion influence undergraduates' credibility judgements of information found online?

Our themes showed that emotion influenced credibility judgements in a number of ways, from providing unique information that could help or hinder credibility judgements to motivating the search for information or checking the credibility of information. Emotions are also integrated into the overall constructs of credibility and are influenced by and part of the context. In RQ2a we discuss how emotions provide both relevant and irrelevant information, explaining why in RQ2b emotions can be both helpful and hindering. In RQ2c, we discuss how the varying influence of emotion on credibility decisions can be explained through understanding the influence of contextual factors, including incidental emotions.

5.3.1 RQ2a. Does emotion provide information about a source with regard to credibility? If so, what kind of information does it provide?

5.3.1.1 Emotion as Informational

Schwartz's feeling-as-information theory provides the basis for understanding emotion as potentially providing some kind of information during the process of credibility checking (Schwartz, 2012)although it was acknowledged in information behaviour research as well, in Dervin and Reinhard's theoretical thrusts, for example (Dervin and Reinhard, 2007). Understanding how emotion is 'informational' requires a broader understanding of 'information' that what previous cognitive definitions may have made explicit. We saw an exploration of some of the more open definitions of information in the work of embodiment and pleasure seeking in our literature review, where non-verbal signals, and body language – both internal and external, provided a rich source of information often ignored in purely cognitive-based definitions of information (Fulton, 2009; Keilty, 2012; Lueg, 2015; Cox et al, 2017). In closely related work on affect-as-information, Clore et al. described the information from emotions as 'experiential,' both in relation to other cues and on its own:

> It is important to note that the information to which we refer is experiential rather than conceptual information. For example, positive affect may be experienced as liking or success, as opposed to activating concepts about liking or success. However, by itself, the affect is simply an experiential form of goodness or badness. Its information value depends on the object to which this experience of goodness or badness is attributed. This process is the subject of the Attribution Principle. (Clore et al., 2001, p. 6)

The Attribution Principle posits that affect may only be informational when it is attributed *to* something. Feelings that come from unknown causes cannot be said to be informational about a decision at hand and are more likely providing misinformation. Thus, awareness of the attribution of a feeling is key in being able to interpret properly the information that emotions are giving. This development in the understanding of attribution in the informational value of emotion ushered in the more nuanced Feeling-as-information theory (Schwartz, 2012) used in this study; the concept of 'feeling' differentiated affect into incidental and integral, among other distinctions. Hilligoss and Rieh's framework is well suited to Schwartz's feeling-as-information theory, because its scaffolding helped distinguish more clearly where integral and incidental emotions influenced credibility decisions: the Interactive level dealt mostly with integral emotions, in association with the credibility cues. Incidental emotions were part of the context, exerting influence from the outside. However, It may not be as straightforward as integral emotions equal good information and incidental emotions equal bad information, particularly in the case of motivation. Below we discuss how integral and incidental emotions may be providing information, and how the distinction between the two is not clear.

5.3.1.2 Integral Emotion

At the Interactive level, we reported that emotional cues were providing information about the value of their associated cognitive cues, but these valuations did not necessarily constitute *judgements* of credibility in themselves. This finding may be explained by Damasio's 'somatic marker' hypothesis, whereby objects or events are marked by emotion for easier recall later (Damasio, 1994; 2005). The theory helps to explain the learning power of the Interaction level, as markers are both learned from actual interactions and recalled through thoughts and

memories about those interactions. Tyng et al.'s review of emotion in learning discusses how emotion regulates memory and recall, as well as attention and motivation when learning (Tyng et al., 2017). At the Interaction level, emotion may be playing several roles, including marking cues for future recall, as well as influencing which cues are even noticed by directing attentional and motivational aspects of processing.

Slovic et al.'s Affect Heuristic theory uses Damasio's somatic marker hypothesis as a basis (Slovic et al., 2006). According to them, the Affect Heuristic is a process whereby "representations of objects and events in people's minds are tagged to varying degrees with affect. In the process of making a judgment or decision, people consult or refer to an 'affect pool' containing all the positive and negative tags consciously or unconsciously associated with the representations" (Slovic et al., 2006, p. 1335). These micro evaluations, however, are not clearly linked to credibility *per se*, but only whether the thing in question is marked as good or bad, a general valuation to contribute to the decision, but not a decision in itself. It may be that our participants who left sources based on their reactions to superficial qualities were reacting to their general good/bad evaluation. It is important to mentioned that 'heuristic' in Slovic et al.'s Affect Heuristic theory is not the same as Hilligoss and Rieh's version of heuristic. We address this in the subsection on heuristics below.

In RQ1b, we discussed how emotions seemed to have stronger relationships with particular cues, which may have implications on the information they convey. Hsee's Evaluability hypothesis gave an explanation for why some cues seem to be given more weight in decisions than others (Hsee in Slovic et al., 2006). He found that the weight of a cue or criterion in a decision is directly related to the ease and precision with which affective information (valence) can be mapped and may explain why more superficial characteristics like design elements or quality of sounds/images videos are given more weight in a credibility judgement.

Attribution at the interactive level was sometimes difficult to perceive, even when the emotion could be attributed to the information object or source in general. Our participants sometimes showed that feelings were attributed to particular cues, giving information about them in terms

of their quality and in terms of their contribution to a credibility judgement; other times, our participants reported having feelings, but having much less awareness of the attribution beyond the information object in a general sense. It was difficult to know whether these emotions were a result of interactions with the information at hand (integral) and simply subconscious, or incidental emotions from previous interactions or even mood-states that were carrying over, thus, it was difficult to know the informational value of these emotions.

It may be that these general emotional experiences are not always easy to attribute because they are largely subconscious. In our results, we reported that the informational influence of emotion was often subconscious to the participants, only recalled upon reflecting or probing from our interview questions. Asutay et al.'s recent study of emotion in information integration shows that our affective experience while looking at information is a cumulative process, with consciously noticeable emotions being an integration of current and previous emotional reactions to stimuli (Asutay et al., 2019). This 'affective calculus' model of emotion may explain our findings about the overall feeling of emotion as the result of a process of many interactions, considering that many of our participants felt that this process was largely subconscious.

5.3.1.3 Incidental Emotion

We have noted that incidental emotions are largely considered to provide irrelevant information for credibility decision-making, but also noted in the literature review that the distinction between incidental emotion and mood is not always clear (Schwartz and Clore, 1983; Schwartz, 2012; Lerner et al., 2015; Vastfajall et al, 2016). Various studies of the influence of moods and incidental emotions have shown influence over decision-making, usually by biasing what information is perceived or recalled or by providing emotional information that is irrelevant to the decision (Schwartz and Clore, 1983; Slovic et al., 2006; Phelps et al., 2006; Finucane, 2008; Schwartz, 2012; Lerner et al, 2015). Incidental emotions can influence which emotional cues are noticed, through mood-dependent recall (requiring the same mood as the original memory for recall) and mood-congruent recall (recalling memories of the same emotion as the current mood) (Schwartz, 2012; Lerner et al., 2015).

Lowenstein et al.'s *risk-as-feeling* hypothesis - closely related to Schwartz's feeling-as-information theory - employs the concept of *anticipatory emotion* in risk assessment (Lowenstein et al., 2001). Anticipatory emotion may help to explain the influence of incidental emotion in decision-making, although it leaves the role of integral emotion in question. For Lowenstein, *anticipatory emotions* are immediate and experienced visualizations of outcomes that can overwhelm cognitive cost-benefit analyses, ignoring probability analysis in lieu of the emotional information. It is a kind of incidental emotion as it does not directly relate to the object at-hand, but different in that it is part of a possible outcome, rather than a previous emotional experience. In their hypothesis, there does not seem to be a role for integral emotion in the cost-benefit analysis, however. Our study found integral emotions contribute important information about relevant cues *particularly relevant to* the cost-benefit analyses. Lowenstein et al., acknowledge that cost-benefit analysis impacts emotional reactions, but this impact is negligible compared to the anticipatory emotional information, which they claim will often lead to starkly different behavioural outcomes than cost-benefit decisions. Lowenstein et al. remark on the importance of neutralizing the influence of anticipatory emotion on decisions for policy development regarding public health and safety, but without better understanding the distinction and the relationship between incidental and integral emotional information, neutralizing this information may not lead to better decisions. Research has indicated that emotional information is critical in good decision-making (Damasio, 1994). Being able to better disambiguate both types of emotion is an important direction for future research on emotion and decision-making if we hope to benefit from integral emotional information.

Appraisal Tendency theory to some extent also blurs the line between incidental and integral emotions by asserting that emotions 'prime' users to make particular judgements (Tiedens and Linton, 2001; Lerner et al., 2015). It is not clear whether this 'priming' influence refers to an incidental effect on subsequent decisions, either through its effect on attention to cues (Phelps et al., 2006) or a process similar to mood congruency (Slovic et al., 2006). If users are primed to only see cues marked with the same emotion as the incidental one, then information gaps would exist at the Interactive level, just as with Lowenstein et al., anticipatory emotions, Asutay's emotional calculus, and Hsee's Evaluability hypotheses. Although the distinction

between incidental and integral is conceptually important in understanding the role of emotions in decision-making, we begin to see that the line between them is murkier than is usually expressed in their definitions. If integral emotions have the potential to be relevant to decision-making, it is difficult to see how their information can be separated from the effects of incidental emotions.

5.3.1.4 Other Components of the Emotional Experience

We noted in our Theoretical Framework section that emotions have multiple components and are not limited to the feelings we used to operationalize emotions in our study; emotions also have biological and neurological components (Scherer, 2005). In our Literature Review we reported on a series of experiments in Information Retrieval (IR) that demonstrated the informational value of emotions in how sources are searched for and selected based on biometric measurements (Lopatovska, 2014; Arapakis et al., 2008; Moshfeghi and Jose, 2013; Zanganeh and Hariri, 2018). Arapakis et al. used face tracking software in combination with self-reporting to find what kind of emotions were associated with IR tasks. Facial expressions are not generally consciously available to a user, and therefore difficult for users to self-report; Lopatovska reported this as well in her study of primary and secondary emotions in the information seeking process (Lopatovska, 2014). Arapakis et al.'s data show one very strong emotion (surprise) and a number of subtler ones. They posited that the smaller emotional reactions would have likely been tied to particular searching events, rather than an overall feeling, which the larger reactions indicated, supporting Asutay et al.'s affective calculus theory. In future experimental work, being able to distinguish between integral emotional reactions to particular activities or – in the case of credibility checking – particular cues, would help to pinpoint the attribution of the emotional information, and whether it was contributing relevant information or not.

Another informational aspect of emotion was found in Moshfeghi and Jose's study, which used biometric data in combination with dwell time to provide information about relevance judgements of their participants (Moshfeghi and Jose, 2013). In their model, emotions were

informational for an information system, rather than the participant or user. In other words, the system observed the emotional information from the user to make predictive judgements about what will be considered relevant. However, the principle is the same, that a user's emotions provide information about the credibility of an information object. Because the more subtle information from our emotions tends to be difficult to access, future studies of emotion and credibility would benefit from the addition of biometric or neurological methods. However, it should be noted that in Arapakis et al, there were differences between the reported emotions and the detected emotions. It was not determined which was considered more accurate in their study. We noted that this can be a limitation in triangulation that tries to support self-report findings with other sources of data about emotions such as biometric data.

5.3.1.5 Emotional Information and Heuristics

Much of what we have discussed so far regarding the informational value of emotions has to do with the Interaction level; however, we also found that emotions had an information value in the development and use of heuristics, particularly in the case of trust. It is important to note that heuristics in the sense that Hilligoss and Rieh use it is different from the way it is used in heuristic theory, including the affect heuristic theory (Tverksy and Kahneman, 1974; Bodenhausen, 1993; Slovic et al., 2006). Heuristics in Hilligoss and Rieh's framework refers to more macro-level thought processes, learned or adopted through experience or observation, that can be used to make quick and easy *credibility* judgements. They link criteria with credibility through generalizable rules or strategies, so that they can be quickly applied in various situations. As we mentioned above, Slovic et al.'s affect heuristic refers to micro-processes, where thoughts are recalled more quickly and easily through somatic markers. However, both concepts of heuristic represent quick and easy paths to decision-making; the affect heuristic may, in fact, play a key role as to how Hilligoss and Rieh's heuristics function.

The informational value of emotion in heuristics was twofold: first, it encodes into the rule whether it was assessing credibility (positive valence) or non-credibility (negative valence); second, the emotion made it quick and easy to recall and render a quicker judgement. It could

be argued in the case of Hilligoss and Rieh's definition of heuristics that emotions are a key component of their efficiency, *as per* the affect heuristic theory of Slovic et al. We saw that heuristics were established when participants had personal experiences that consistently lead to success or lack of success in finding credible information, or when participants adopted rules that did the same. The memory of those successes, marked with a good or bad feeling, could be recalled for related experiences. It is possible that the process of recall is part of the mechanism by which criteria are generalizable to other situations, and emotion plays a key role in that recall. In the case of adoption, where a rule is accepted without much previous experience (e.g. myth building vs trust building), the emotion is encoded in the rule though a less vigorous process.

5.3.1.6 Trust as heuristic

Our literature review showed that trust was not a well-defined concept in the credibility literature, although it clearly has some important relationships to credibility, through the construct of trustworthiness (Fogg and Tseng, 1999; Wathen and Burkell, 2002; Hilligoss and Rieh, 2008; Ginsca et al., 2015). In our findings we stated that we used Hilligoss and Rieh's definition of heuristic and construct to help define trust as heuristic and trustworthiness as the construct to which trust is oriented, thus making clear the connection between trust and trustworthiness and their relationship to credibility. By defining trust as heuristic, we are also able to draw on some literature that has considered a role for emotion through self-efficacy (Bandura, 1977; Nahl, 2004, 2005; Slovic et al, 2006; Hocevar et al., 2014; Chasiotis et al., 2019).

Trust as heuristic is not a new idea; trust has been identified as a useful guide in making decisions about risk when faced with a lack of information in Business and Communication research (Lewicki and Brinsfield, 2011, Cummings, 2014). Lewicki and Brinsfield's concept of trust as heuristic shares many similarities with our findings. They define trust in terms of 'framing' rather than as a rule or strategy, but similarly explain its purpose for making decisions: "…once formed, the trust and/or distrust-frame may function as higher-order decision heuristics with psychological underpinnings." Also similar to our findings, this framing provides: "a rationale and direction for taking action" (Lewicki and Brinsfield, 2011, p.9). Most

significantly, they find trust has an equally important affective dimension, which resembles the informational role of emotion that we found in our study:

> Whether these emotions arise from positive attraction and affection for a close friend, or anger and disappointment following trust betrayal by that same friend, both sets of emotions tend to affect the overall cognitive evaluation of trust and the other's trustworthiness. (Lewicki and Brinsfield, 2011, p. 6-7)

They note that trust is persistent and transferable to other, similar situations, resembling the generalizability that is part of Hilligoss and Rieh's definition of heuristic. They also point out that trust that tends to be more affective is more sustainable than trust that tends to be more cognitive, an observation which supports the idea that emotion is important for creating and using heuristics. This also may explain why some heuristics can withstand the challenges from rational arguments and indicates the importance of the intensity dimension of emotion as a key component of its function; a strong emotion may outrank a strong argument.

5.3.1.7 Types of Trust

As we saw in our literature review, much of the literature on trust is based on interpersonal trust between two human parties; the focus is on the trustor's propensity to trust and qualities of the trustee (integrity, benevolence, competence) (Mayer et al., 1995; Heyns and Rothmann, 2015). Some research has distinguished between 'trust' and 'confidence,' where one can have trust in regard to another person or party but confidence in the case of technology or objects (Fogg and Tseng, 1999; Friedman et al., 2000). The distinction is based on the reasoning that the trustee either must have the ability to have good will or the ability to deliberately deceive the trustor; technology cannot have these agencies (Friedman et al., 2000; Siegrist, 2021). However, the distinction between the user and technology is somewhat complicated in the case of information technologies, where social and technological components are intertwined (Cho et al., 2015; van der Werff et al., 2018). Cho et al.'s composite trust describes multiple contextual parameters through which trust is mediated that include both social and technological aspects. We used our participants stated experiences of trust regardless of

whether the trustor was considered to be human or technological. It is likely that more studies that examine trust from this approach would find other types of trust, as our study was limited to only 18 participants reported about particular situations and contexts.

We also found that the different types of trust had different levels of rigor depending on their rationale and whether they were learned through experience or adopted with little thought or challenge. This approach to rigor could be compared to Mayer et al.'s key factors of trust: benevolence, integrity and ability (Mayer et al., 1995). According to Mayer et al., trust that is not based on a solid grasp of all 3 factors in the trustor is less meaningful, and possibly more fragile. For example, reputation-based trust seemed to be less rigorous than relationship-based trust, since one assumes less overall knowledge of the trustor than the other.

We found an interesting parallel to our findings in the previous research on *self-efficacy*, which coincidentally overlapped our findings on self-efficacy-based trust. Of all our types of trust, self-efficacy-based trust stands out from the others, as it is self-reflective basis for trust, a meta-cognitive trust in one's own competency that underlies trust in external things. Self-efficacy has been researched extensively, since Bandura's seminal article on the subject (Bandura, 1977). Bandura found several 'sources' of self-efficacy information that support some of our findings about trust as a heuristic. According to Bandura, previous experience (accomplishments), vicarious experience, persuasion, and emotional arousal underpinned self-efficacy, each giving information about the status of one's self-efficacy. Bandura notes that 'vicarious experience' is a 'weaker' basis for self-efficacy, and may result in less stability:

> Vicarious experience, relying as it does on inferences from social comparison, is a less dependable source of information about one's capabilities than is direct evidence of personal accomplishments. Consequently, the efficacy expectations induced by modeling alone are likely to be weaker and more vulnerable to change. (Bandura, 1977, p. 197)

He makes a similar observation about 'persuasion': "Efficacy expectations induced in this manner are also likely to be weaker than those arising from one's own accomplishments

because they do not provide an authentic experiential base for them" (Bandura, 1977, p. 197). We found that 'trust-building' in general was based on previous experience or one's own knowledge, whereas the less rigorous 'myth-building' could be said to be based on vicarious experience and even persuasion by others, because it was often based on others' opinions or reputation.

Bandura's study focus is phobias, hence, the 'affective' sources he refers to as *emotional arousal* are largely stress and anxiety, which inhibit self-efficacy by giving information about an anticipated failure. We also found stress and anxiety to be restricting in credibility checking but found that there were other more constructive emotions that supported trust in self-efficacy, such as confidence. This was found in the literature review on trust as well, where trust is a similar feeling as confidence, although "the first is the result of a conscious analysis of a target, while the second is to a large extent implicit and diffuse"(Ginsca et al, 2015, p. 12). Bandura does not consider the role of positive emotion that may be more constructive in building self-efficacy in his seminal work. This may be due to his focus on the arousal dimension of emotion as opposed to other dimensions, such as valence or control, which may give different kinds of information about self-efficacy. He does, however, note that the motivational aspect of emotion can be helpful in overcoming phobias; here is the helpful-hindering conflict we found and will discuss in the subsequent section on RQ2b.

Self-efficacy has previously been identified as an important factor in both credibility and IB research. (Nahl, 2004, 2005; Hocevar et al., 2014; Chasiotis et al., 2019). Hocevar et al. (2014) found self-efficacy to be an important factor in how users evaluated information online. They use Bandura's concept of self-efficacy to measure the effect of self-efficacy in social media use and found that those with more self-efficacy found the information on social media to be more trustworthy. However, they assumed that affective sources of information about self-efficacy would be less influential online and did not include this source in their inquiry methods.

Nahl's research on the Affective Load Theory (ALT) found self-efficacy to be one of the affective coping skills - in addition to optimism - that helped ease the affective load of information

seeking and searching (Nahl, 2004, 2005). Also using some of Bandura's concepts, Nahl developed measures for affective load and affective coping and found that those with lower affective coping measures had a higher affective load than those with higher measures. Nahl pits affect against affect in her study: optimism represents the 'motivational' aspect of emotion and self-efficacy is identical to self-confidence; affective load consists of uncertainty and 'technophobia,' which result in negative emotions such as stress, frustration, irritation and pressure. In our study, self-efficacy-based trust encoded emotional information (sometimes expressed as confidence) about one's own ability to judge credibility. While we did not explicitly find 'optimism' as part of self-efficacy-based trust, we did find a kind of optimism (open-mindedness) motivated participants to consider points of views that were not their own, a kind of trust in their own ability to process other perspectives. We also found that self-efficacy-based trust, as a heuristic, may be 'coping' with affective load by circumventing some of the process of questioning one's own ability to judge credibility in different situations by generalizing across contexts.

For Chasiotis et al, (2019) Health Information Searching (HIS) self-efficacy referred to the ability to deal with (process) health threatening information, which was differentiated from emotional regulation or the ability to downplay less constructive emotions over more constructive ones. Again, self-efficacy is a kind of meta-cognition about one's probable successful or unsuccessful processing and involves confidence in one's abilities to emotionally regulate in the face of threatening information. Our self-efficacy-based trust was based on one's confidence in their ability to interpret information; this may also include the ability to cope emotionally with the threat of that information, particularly with respect to the dual, information-emotion role that HIS plays.

Bandura's various sources of self-efficacy information present an interesting framework to explore our other types of trust, particularly in terms of rigor similar to Mayer et al.'s factors of trust (Bandura, 1977; Mayer et al., 1995). Types of trust that are based more on vicarious experience or persuasion sources may provide less consistent or less stable rules for credibility judgements than others. For example, reputation-based trust is based more on vicarious and

persuasion sources and may tend to provide a more easily challenged basis for trust, whereas relationship-based trust is based more on personal experience and affective sources. In combination with Lewicki and Brinsfield's trust heuristic, seems to point to affect as being a key player in maintaining heuristics through challenging interactions. Our findings on losing trust show that it tended to be emotionally charged cues that were most likely to present challenges to heuristics, which is consistent with the idea that affect sustains – and breaks down – heuristics.

5.3.1.8 Depth of processing

Depth of processing theories of emotion are closely related to motivation and help to further distinguish between the Heuristic and Interaction levels of credibility. In his review, Bodenhausen found that both negative and positive emotions are correlated to heuristic, or 'automatic' thinking, in particular, stereotyping (as opposed to systematic thinking) (Bodenhausen, 1993). The major finding was that positive emotions, such as happiness, could result in the same superficial processing as negative ones. Positive emotions can tell individuals that all is well, and thus investigation into the current circumstances is not required. Intense negative emotions, such as stress and anger, can overload the processing system and require immediate action, also triggering the heuristic system. While Bodenhausen does not explicitly use the dimensional models of emotion, themes of control and arousal seem to be part of his explanation for different emotions' influence on depth of processing. The finding explained why a happy person was just as likely as an angry person to stereotype others, a result that seems somewhat counterintuitive. This finding is critical for educators and designers, who wish to encourage systematic thinking in their users and students. Positive emotions have been found to accompany good IB outcomes, but this is not always the case, particularly when trying to inspire critical thinking in the judging of credibility. Zanganeh and Hariri found that happy users had better search outcomes, measured by the length of time spent on a search (Zanganeh and Hariri, 2018). While this may be the case for searching, happiness may result in primarily heuristic credibility checking strategies, even if systematic ones are more appropriate, as with academic or high-stakes information contexts. This is a key finding since we are making a case

for including credibility within the greater IB process; it will be important to distinguish when emotions that may be helping the information searching process could also hinder the credibility checking process.

As we mentioned in the subsection above, our participants reported that emotions could signal a conflict with their heuristic processes, for example, surprise about an outrageous headline would challenge their trust in a favourite source. These reports show that emotional cues on the Interaction level of credibility can play a very different informational role than in the Heuristic level – the latter tells the participant that everything is fine with the source, and checking is not necessary (comfort, relief) while the former tells participants to be vigilant and check further. This describes the learning power of the Interaction level, where heuristics are reframed by new information, supported by emotional cues. It also emphasizes that the Interaction level can often involve uncomfortable or challenging feelings that need to be managed, a theme we discussed in RQ2b.

A body of research from Psychology that employs neurological methods, such as imaging, to explore questions about cognition has identified a 'dual process' of cognition; one 'automatic' and the other 'systematic.' Greene et al.'s work on moral reasoning uses fMRI imaging to show that systematic thinking is needed when automatic thinking is challenged through moral dilemmas (Greene et al., 2004). While they have found evidence that the areas of the brain associated with emotion are recruited during automatic processes, they do not find evidence of emotions as part of the systematic processing. We suggest that the dual process model may be missing another process, the *experience* or *learning* process, whereby new thoughts, images, and other informational cues enter the field of experience and are marked with emotional information according to the somatic marker theory (Damasio, 1994). These markers become encoded into automatic processes to be recalled easily, but the experience of challenging automatic thinking appears to have an emotional dimension as well, a process separate from either automatic thinking or systematic thinking, that we would allocate to this experience or learning process.

5.3.1.9 Emotion as information beyond valence

So far, theorizing about the kind of information emotion provides has been based on the valence dimension (positive & negative). However, noted briefly in our findings that there were other ways that emotion may be providing information about credibility beside valence, based on the other dimensions or attributes that have been identified in the literature, such as arousal or control (Smith and Ellsworth, 1985; Roseman et al, 1990; Mehrabian, 1996; Scherer, 2005; Lerner et al, 2015.). We also noted that certain dimensions from the literature may be more appropriate to issues of credibility than others, such as the certainty/uncertainty dimension; or the attention dimension, which pertains to whether the object or event is even considered at all (Smith and Ellsworth, 1985).

As we discussed in our Theoretical Framework section, the concept *appraisal themes* uses multiple underlying dimensions to differentiate discrete emotions through their position on those dimensions (Lazarus, 1991; Lerner and Keltner, 2000; Lerner et al., 2015; Myrick and Willoughby, 2017). The Appraisal Tendency Framework (ATF) from Lerner and Keltner (2000) is based on a six-dimensional model of emotion, including pleasantness (valence), individual control, certainty, responsibility of others, attentional activity, and anticipated effort. Where an emotion lies on these dimensions can predict how it may influence decisions about risk through the tendency to appraise a situation in a certain way (Lerner et al., 2015). They give the examples of anger and fear, both of negative valence, but with different dimensions of control and responsibility. Because anger rates high in both control and responsibility, it tends to produce appraisals that negative events are "predictable, under human control, and brought about by others," which leads to decision outcomes of "low risk." Fear on the other hand has low control and medium responsibility and tends to produce appraisals that negative events are "unpredictable and under situational control," which leads to decision outcomes of "high risk" (Lerner et al., 2015, p. 806).

The ATF is based in risk-assessment research, but a similar framework could be developed based on credibility decisions. Understanding how the various underlying dimensions of

discrete emotions deliver different informational value for credibility judgements could lead to predictive models of credibility judgement based on one's emotional reaction to information. The ATF has mapped 4 discrete emotions (anger, fear, surprise, and pride) in relation to risk decisions. The Geneva Emotion Wheel (GEW) (Scherer et al, 2013) has mapped 20 emotional words into their various relative positions on a multi-dimensional wheel chart, although it uses three somewhat different dimensions than the ATF (Valence, Control and Intensity). Understanding which dimensions would be most relevant in credibility judgements would help in any decision to use either the ATF or the GEW or another dimensional model in future studies on credibility.

5.3.1.10 Emotion and Motivation

As we saw at the beginning of RQ2a, Schwartz's conceptualization of feeling-as-information defined the information from emotion as part of the *experience* of processing cues in order to judge credibility. We found that experiencing credibility involved being part of a process of checking credibility or experiencing the situation that led to the need for credible information. In either case, there a motivational role for emotion that was as important as its informational role, although the two were at times in conflict, as we discuss in answering RQ2b. Additionally, as a process within the overall IB process, it is important to be aware when emotions that are motivating in one may be inhibiting in another.

At the Interactive level, cues are not themselves always directly associated with credibility judgements but are part of the iterative process that can lead to a credibility judgment; they can also lead to other outcomes, with several of our participants reporting that they stopped checking or navigated away from a source without having necessarily made an explicit judgement about its credibility. Immediate or initial reactions were usually in response to peripheral information object cues; depending on the site, they could be design elements, a heavy presence of advertising (pop-ups), or the quality of language. Participants often reported leaving a source because of their initial reaction to design elements, quality of language, or presence of advertisements; this was usually accompanied by a corresponding emotional cue,

such as disgust or irritation. Interactions make up the process of checking credibility, which could be nested in the IB cycle (e.g. Wilson, 1999), and modeled in the credibility models and frameworks from our literature review. In particular, Wathen and Burkell (2002) have a staged-based model of the components of credibility checking, explaining how the user start with checking 'surface' features, and then move on to source and content features; approval at one stage leads to checking of the next. Our findings suggest a key role for emotion in this process-based model, since we found that emotion motivates or demotivates the next step in checking.

We also found evidence of the motivational role for emotion in context, where incidental emotions both motivate the search as well as influence how credibility checking proceeds. Emotions were motivating or demotivating as a *need to do something*, including the need to check information; this came up in Health information when fear or discomfort drove a need to do something to alleviate stress, or in the case of interest in a topic, which spurred more checking into credibility. Motivation is part of the adaptive or functional approach to emotion, defined in Frijda et al.'s Action Readiness (Frijda et al., 1989) and the 'emotion is for doing' concept from Zeelenberg et al. (2008). The Action Readiness and 'emotion is for doing' connect decision-making and the need to do something in response to a given stimulus. They are also based on dimensional models of emotion, which propose that emotions will tend to result in different kinds of action readiness depending where they lie on the different dimensions. Action readiness and appraisal tendency are closely related, and in fact, one serves the other by providing themes on which to make a decision to act. As Frijda et al put it, emotion answers both questions: "What do we want and how are we going to get it?" (Frijda et al., 1989).

In Zeelenberg et al.'s concept of 'feeling is for doing,' emotions orient or motivate an individual toward a goal (Zeelenberg et al., 2008). The motivational function of emotion can help to clarify why both negative emotions and positive emotions can lead to checking of credibility, as opposed to just positive emotions; goal orientation can be associated with both negative and positive emotions, if the goal inspires such a reaction. We found that both negative emotions (e.g. skepticism, suspicion, and anger) and positive emotions (e.g. interest, curiosity) are associated with the motivation to check credibility, because credibility goals do not always

emerge from positive experiences. For instance, if a source makes me suspicious, my goal would be to find proof that it is in fact, incorrect.

Emotion as motivation has been a theme in IB research on affect from early on. IB is usually modeled as a process or series of behaviours, requiring some motivator. This was often limited to uncertainty motivating a need for information; and satisficing, where a sense of completion stops motivation. Kuhlthau fleshed out the motivating role of affect throughout her Information seeking Process model, adding 'interest' as a complementary motivator to uncertainty (Kuhlthau, 1991). Wilson transformed the more rational concept of 'uncertainty' into a more affective concept of 'stress and coping' to his IB model (Wilson, 1997).

More recently, Savolainen's conceptual work on the role of emotion in IB produced a flowchart showing where emotion motivated or demotivated information seeking (Savolainen, 2014). He integrates more robust psychological concepts for affect such as appraisals of situational attributes and goal relevance. Continual appraisals motivate information seeking at various stages, either expanding, limiting, avoiding, or terminating information seeking. Savolainen finds that emotions from the appraisal of the situation motivate information seeking, and that emotions arising from the subsequent information seeking activities influence decisions to continue or stop. We also found motivational aspects of emotions, which were also found to expand, limit, terminate credibility checking, as well as contribute to an overall decision about credibility. Savolainen does not distinguish between incidental and integral emotions in his model, which may result in conflating the influence of emotion when initiating the search and the experience of integral emotions from subsequent interactions; this distinction is important to understanding whether emotions were helping or hindering the process as we discuss in the answer to RQ2b.

In answering RQ2a, we saw that emotion provides both information and motivation for credibility checking in a number of ways. The issue of whether the informational and motivational aspect of emotion was helpful or hindering to our participants' credibility judgements is central to understanding how emotion influences credibility judgements. It is

also essential to understanding how the process of credibility judgement fits into the great IB cycle. Emotions are complex, consisting of several dimensional attributes that can be difficult to interpret. In addition, emotions are influenced by situational factors that can render information irrelevant or even detrimental to credibility judgements. The answers to our next 2 sub-questions examine these issues more closely.

5.3.2 RQ2b. Does emotion help or hinder credibility judgements?

The literature in Health information seeking has given evidence of where emotion has hindered access to information (Wilson, 1997; Lee et al., 2008; Anderson & Agarwal, 2011; Costello, 2016) Similarly, feelings of fear of judgement or stigmatization restricted IB for some groups (Chatman, 1996; Lingel and boyd, 2013; Loudon et al., 2016; Ruthven et al., 2018) We also noted research that found emotions could help IB outcomes (Zanganeh and Hariri, 2018). At the end of our interviews, we asked our participants the question whether emotions help or hinder judgements toward the end of our interviews. An analysis of the answers shows that there is no agreement on whether emotions help or hinder, with some participants indicating that emotions both help *and* hinder. However, we were able to conclude that some patterns exist as to whether and how emotions help or hinder, depending on a number of factors, including whether the emotion was incidental or integral to the information being checked, the valence of the emotion, the information topic, and the situation from which the need emerged. As we saw in RQ2a, the distinction between integral and incidental emotions is crucial in understanding whether the information emotions give is helpful or hindering: "While reliance on incidental feelings can indeed be dysfunctional, integral feelings provide valid information and attending to this information is highly adaptive…." (Schwartz, 2012, p.296). The information from incidental emotions can be misleading and irrelevant to decisions about the object or event at hand, while integral ones are potentially useful. However, as we saw above, the line between integral and incidental emotions is not always clear.

We found examples in both cases of emotions helping and hindering the motivation to check credibility. The same can be said for valence: we found that valence did not always predict credibility checking, and that negative emotions were often associated with more credibility

checking, while positive emotions could be associated with less checking, or none at all. We touched on this in the Depth of Processing subsection, which saw that happiness invoked more heuristic thinking while negative emotions invoked more critical thinking (Bodenhausen, 1993). Studies in LIS as well do not always find that good emotions are associated with good IB outcomes (Gwizdka and Lopatovska, 2009; Zanganeh and Hariri, 2018). Below we discuss in more detail integral and incidental emotions may have helped or hindered credibility decisions, based on their informational and motivational roles.

5.3.2.1 Integral Emotion

In our discussion of RQ2a, we saw that integral emotions brought unique information about cues, and as such, should be considered important, if not helpful. *How* helpful integral emotions could be may depend on the participant's awareness of where they are coming from and their interpretation of the meaning of emotion the greater scheme of credibility (Schwartz and Clore, 1983; Yip and Cote, 2013).

In their experiments on emotional intelligence and incidental emotion, Yip and Cote wrote that *emotion-understanding ability* (as measure by the MSCEIT) is key to being able to disambiguate the influence of incidental emotions and integral emotions (Yip and Cote, 2013). They found that those measuring higher emotion-understanding ability were able to mitigate the influence of incidental anxiety when making risk-based decisions. Hence, there is reason to explore whether IL education models should consider including emotional awareness or intelligence as part of the competences. Cahoy and Schroeder give various suggestions as to how to include affective learning outcomes in IL education, including self-efficacy, motivations, emotions, and attitudes. Although they do not employ Psychological principles in their frameworks, they address some of the more LIS-based affective theory in their discussion, such as library anxiety, and Kuhlthau's ISP model (Cahoy and Schroeder, 2012).

Despite the potential for the information from integral emotions to help our credibility judgements, it is not clear what level of emotional awareness is needed to be able to use the information from integral emotions. In our discussion of RQ2a, we saw that the informational

value of emotions may provide more weight to certain cues, making them more noticeable; at the conscious level this would hinder the rational cost-effect balancing (Slovic et al., 2006), giving more weight to features that may not provide strong information about credibility. Because much of the processing of emotional cues is subconscious, it requires a lot of reflection and awareness in order to notice weaker-precision information from emotional cues for non-visual cues, such as whether information matches other sources, authorship, and other content cues.

There also may be differences among groups of users: Finucane's review of research on older adults and risk assessments and found that this group relied on affect-based heuristic processes when making decisions more than other age groups (Finucane, 2008). She concluded that this was because of more extensive personal experiences that were accessed through emotional recall mechanisms, as opposed to more abstract knowledge base. We also found a stronger association between personal experience and emotion relative to other criteria, which in some cases may be inordinately valuing this criteria over other important criteria.

Emotional weighting and degrees of awareness notwithstanding, the integral emotional information to contribute to credibility checking and judgement is an important area to explore further. Our findings, like other research in emotions and decision-making, show a potential for integral emotions to provide useful information for credibility judgments, perhaps in conjunction with a certain level of awareness or skill in recognizing emotional information and its role in the overall judgement, or in an information system's ability to do so. Integral emotions have a different influence from the perspective of motivation, which we examine in the next subsection.

While integral emotions appear to have a strong potential to be helpful from an informational perspective, they were found to be more ambiguous from the perspective of motivation. Participants reported wanting to check into information more when a cue they encountered made them feel skeptical or excited, such as a headline that was outrageous, or a picture of a location that looked enticing. The work of embodied IB provided an interesting example of how

integral emotions were motivating for leisure information seekers. Keilty's study of pornographic searching found that search times were longer when search processes were considered pleasurable in themselves, and in fact, longer searches were goals for pleasurable searching (Keilty, 2012). A similar finding was reported in Fulton's work on amateur genealogists, whose goal was to spend more time searching because of the 'pleasure principle' inherent in the information (Fulton, 2009). While neither examine credibility specifically, it may be reasonable to extend this principle to some degree in the process of checking the credibility of information, based on our finding that the construct for credibility conformed to the goal of enjoyment and pleasure (4.3.6)

On the other hand, integral emotions were also reported as reasons for leaving websites before making a credibility judgment, in reaction to peripheral or superficial cues from design features. Participants reported feelings of disgust or disappointment about websites that were unappealing, demotivating their credibility checking of that source. In this way, integral emotions were not helpful for credibility judgements, limiting or completely stopping credibility checking before any judgement could be said to have occurred. We will see in the discussion on Managing Emotions how some participants were able to negotiate these feelings.

5.3.2.2 Incidental Emotion

As we discussed in RQ2a, the information provided by incidental emotions is external to, and thus, irrelevant to whether the information is credible or not; in this way one can say that incidental emotions hinder credibility judgements. It is still important to understand the influence of incidental emotions on credibility decisions, since they influence the perception and processing of cues, including integral emotional cues. Participants reported that their feelings when embarking on IB activities tended to carry over throughout their searches, particularly in the case of health and academic information; they reported experiencing increased negative emotions during the credibility checking process, suggesting mood congruency may have been influencing their credibility process. We found that our participants often overlooked cues that might have balanced out their judgements about credibility,

particularly in the case of health and news information. Fear and uncertainty about one's health often led to focusing on only the worst-case scenarios.

As we saw in RQ2a, Asutay et al.'s emotional calculus theory can also be applied in the case of incidental emotions, and to some extent, muddies the distinction between integral and incidental emotions (Asutay et al, 2019). Not only did they find that emotions experienced during interactions had different weights, but that incidental emotions before interactions could influence weighting, and overall emotional experience. Given this micro-effect on each emotional stimulus, it may not be enough to have users be aware of the attribution of their feelings, as this level of awareness seems unreachable to the conscious mind, even given time and reflection. We saw a similar issue with Lowenstein et al.'s risk-as-feeling hypothesis, which posits that anticipation of risk can bring to bear incidental emotional influence on cost-benefit analysis (Lowenstein et al., 2001). At the very least, it may be necessary in future studies to draw more granular distinctions between incidental emotions as moods, incidental emotions from situations leading to IB, and incidental emotions that are based on previously experienced stimuli (Västfjäll et al., 2016)

With Appraisal Tendency theory we saw that incidental emotions could prime users toward evaluating situations in a certain way, possibly by favouring certain cues and ignoring others (Phelps et al., 2006; Slovic et al., 2006; Lerner et al., 2015). Given the assumption that decision-making involved needing more information to make better cost-effect decisions, it would seem that this function of emotional priming is limiting.

It is tempting to categorically exclude incidental emotion from helping credibility judgements, when considering other factors, the situation is more complex. Motivationally speaking, incidental emotions were often helpful by providing the impetus to search for information, and to check the credibility more enthusiastically, as we discuss in the next subsection.

Motivationally, we saw that incidental emotions were often at play when initiating seeking and searching behaviour as well as when checking credibility. While there were many examples of passive information scanning, much of the information searching our participants reported

involved a situation that led to an information need; these situations involved emotions of some kind. We describe in more detail the role of incidental emotion as part of the context motivating search in RQ2c but suffice it to say that without any motivation to look for information, the question of credibility would not arise.

In our analysis, we decided that emotions coming from the context leading to the information need were incidental to the actual credibility of the information objects themselves. We feel that this was an important distinction and helped us to see how incidental emotions could both motivate and obscure credibility checking. However, as we saw in RQ2a, there may be more to the picture, with possible layers of factors each with their own effect, creating a more complex incidental landscape than we could analyse using our theoretical lens.

An example of this complexity can be illustrated in the work based on Chatman's information poverty reported in our Literature Review (Chatman, 1996; Lingel and boyd, 2013; Loudon et al., 2016; Ruthven et al., 2018; Floegel, 2021). For the information poor, their negative emotions stemming from fear of judgement or stigmatization are often outweighed by their feelings related to a need for information or to find a community; however, both these emotions are incidental to whether or not information is credible and can influence how credibility is judged. Lingel and boyd's study of extreme body modification enthusiasts describes how strong interest in the subject overrides fear of judgement by others, motivating the search for more information (Lingel and boyd, 2013). However, these same incidental feelings influence credibility judgements, restricting allowable sources and checking activities. According to Lingel and Boyd's interpretation of information poverty: "people are information poor when they perceive a dearth of information resources that speak to their world view, are suspicious of information from outsiders, and engage in deception to maintain a sense of control over their everyday lives" (Lingel and boyd, 2013, p. 983). Those who are information poor are both suspicious *and* feel the need to hide information or deceive, making finding and judging credibility of information very difficult.

Similarly, Ruthven et al. found that young mothers' feelings of isolation motivated their searches, in spite of their fears of judgement (Ruthven et al., 2018). Their fear of judgement causes them to avoid certain sources, but their need for interaction with others like themselves motivates their searching. Their participants also tended to use deception, and only trusted information from other young mothers. Loudon et al.'s study of first-time mothers found a similar effect, with fear of judgement causing many conflicting emotions, and influence whom they could trust (Loudon et al., 2016).

A further complexity in the motivational role of incidental emotions was noted in our finding that information was sometimes sought to solve an emotion-driven need to *do something* as much as to solve an actual problem. These two different goals sometimes conflicted: for example, our participants expressed a need to look for information for a health problem to appease their worry or fear, even when the assumption was that the information they would find would not be credible or otherwise helpful. It may be useful for designers of health information websites to understand the dual purpose of their sites, that while users may come to their sites motivated by emotions about their condition, their interactions with the site will be influence by these same incidental emotions and influence integral emotions about cues from the sites. We discuss this further in the subsection on Managing Emotions (5.3.2.7) as well as the answer to RQ2c.

5.3.2.3 Bias and Confirmation Bias

Bias and confirmation bias were generally identified as a hindrance to credibility judgements, both informationally and motivationally, with the exception of bias motivating more checking of information from other perspectives or perceived as biased itself. Both incidental and integral emotion can be said to 'bias' the credibility checking process by influencing motivation to check and the informational weighting of cues, particularly with respect to integral emotions (Slovic et al., 2006; Asutay et al., 2019). Bias in the sense of *one's opinions or point of view*, however, is a more stable trait, related to one's knowledge, attitude, or values and was associated more with incidental emotion (Schwartz, 2012). *Confirmation bias* relates to the

favouring and easy integration of information that confirms what is already known or believed (Soon and Goh, 2018; Metzger et al., 2020).

Soon and Goh's report on bias examines research from various disciplines, including Political Science, Marketing, and Psychology. They review a number of conceptualizations for bias and formulate a definition of confirmation bias that closely resembles Hilligoss and Rieh's definition of heuristics: "…less effort, motivation and cognitive resources are required for an individual to assimilate a piece of information that has logical compatibility with what he or she already believes to be true." (Soon and Goh, 2018, p. 7). Essentially, it is easier to process information one agrees with than not. In our analysis, we also suggested that bias and confirmation bias acted somewhat heuristically, by facilitating easier, quicker judgements; but bias also acted similarly to incidental emotion by sometimes causing participants to ignore certain cues, or in some cases, motivated more credibility checking when one's perspectives were being challenged.

The intersection between 'agreeableness' and confirmation bias highlighted the importance of construct in guiding credibility judgements. Leisure information was associated with the construct of agreeableness because it was perceived to be an appropriate guide for more subjective information needs, such as choosing a restaurant or a favourite music blogger. This supported the findings of several of our ELIS researchers who found that pleasure in information seeking motivated longer and more enriching searches (Fulton, 2009; Laplante and Downie, 2011; Keilty, 2012). However, when information needs are more objective as in the case of news, health or academic information, agreeableness is not an appropriate construct of credibility; reliability and truthfulness are constructs that require a more objective approach to judging credibility. Confirmation bias, however, confuses agreeableness with more objective constructs, by associating positive emotions with information that resonates or integrates into one's own perspective or values. If agreeableness is the guiding construct of credibility from confirmation bias, it may obscure more objective constructs, and guide credibility checking processes away from interactions that are not agreeable, hence, hindering the credibility checking process.

5.3.2.4 Critical Thinking and Synthesis

Bias and confirmation bias have important implications on the ability to be critical when judging credibility of information, particularly with respect to news information. Polarization of news into political camps makes the ability to synthesize different points of view more difficult. The avoiding of sources perceived to be biased and favouring of sources through confirmation bias could lead to less exposure to other points of view. Several of our participants noted this was a concern and were aware that their own biases may be keeping them from experiencing other points of view.

Metzger et al.'s (2020) study on selection exposure from our Literature Review found that participants were still motivated to select sources perceived as balanced, despite experiencing cognitive dissonance. However, Soon and Goh found in their review that simply reading balanced sources may not be enough to combat bias and confirmation bias, but that exposure to challenging ideas was necessary: "…it might be insufficient to simply tell people to be fair and objective in their assessment of information and views. Instead, people should be told to consider views apart from their own" (Soon and Goh, 2018, p. 26). It is important to understand the role that the emotions elicited from bias, confirmation bias, and even trusted sources may be inhibiting the ability to synthesize differing points of view, by favouring certain sources, or the processing of certain cues over others. Wollebaek et al. (2019) observed in their work on emotion and political IB, that anger led to actively seeking only similar points of view, thus reenforcing the 'echo chamber.' Learning to identify helpful and hindering aspects of emotions in credibility judgement is an important part of critical thinking and the ability to synthesize multiple points of view.

On the other hand, some participants reported that their bias motivated a need to thoroughly check other points of view, which in some cases, led participants to change their minds. This transformational experience involved negotiating very difficult emotions, and usually came from a surprising or vexing interaction with new information. Our theme of *Managing Emotions* emerged out of these transformative experiences, which we feel deserves further

investigation, particularly from the perspective of IL education. Understanding that negative emotions in credibility processes are normal and can lead to learning is a key finding of our study.

5.3.2.5 Managing Emotions

Managing emotions was an important theme in several ways and occurred in relation to both informational and motivational aspects of emotion. At the Interaction level the process of checking credibility was often cognitively and emotionally laborious, with users navigating multiple, sometimes conflicting cues. Furthermore, these processes did not always lead to credibility judgements, and sometimes left participants frustrated or confused. As we saw in our findings regarding context, real life situations do not always present us with the time, interest level, or energy to undergo these difficult processes, particularly in online information. We found that some participants used strategies to 'manage' or 'get over' some of the difficult emotions in order to get to credible information. Some of these strategies involved ignoring or 'pushing past' negative emotions about peripheral cues in order to continue reading or checking credibility. This was often difficult, but transformative in some cases. Others reported having an 'open mind' about other opinions, or 'giving the benefit of the doubt' as a way of reserving their initial reactions to information.

We also found that heuristics could be used to circumvent some of the work involved in the interactive process, by encoding previous successful processes (or adopting them through other means) in order to reuse and recycle them in similar situations. We discussed under RQ2a how the encoding of emotional information supports heuristics by providing quickly understood information about the credibility of information that was easily recalled. While we found evidence of this in many kinds of heuristics, we focused on 'trust' as a type of heuristic closely associated to the credibility construct of trustworthiness. However, even trusted sources and other heuristics were sometimes challenged, a particularly difficult experience when it led to losing trust or otherwise changing or reframing a heuristic. The process was described as uncomfortable, but also transformative.

Another way participants described managing their emotions was linked to the motivational aspect of incidental emotions. They reported a need to look for information in order to assuage their feeling of a need to do something, even when information was expected to be non-credible. This occurred often the in the case of health information, where multiple participants claimed to search for information instead of doing nothing, even when they felt that the information would not be credible or useful. This kind of emotional management did not necessarily help credibility judgements, although hypothetically it may motivated searches that ultimately resulted in credible information from time to time.

Other theories and findings from IB research could be categorized under the 'managing emotions' theme. Miller's blunting and monitoring theory is a well-established theory related to managing emotion in health information seeking (Miller, 1987, 2014). Miller found that people needed different amounts of information to address the stress from awaiting a health outcome or diagnosis (Miller, 2014). Monitors cope best with more information and blunters prefer to avoid information about difficult issues. We also found both these tendencies in our participants but attributed them to managing one's emotions through searching for information or avoiding those emotions through avoiding information. However, whether one tends to do one or the other may be attributed to their personality, such as Miller's monitors and blunters. Further studies might look at the connection between the types of emotions experienced by monitors and blunters and their coping strategies when managing those emotions. Addison's dissertation sees the distinction between monitors and blunters as two extremes on a sliding scale, finding that avoiding health information was a coping strategy applied with nuance that depended on various aspects of their condition and personal needs, including which emotions were elicited by their situation (Addison, 2017). We will discuss how situational factors can nuance how emotions influence credibility decisions further in RQ2c.

Wilson's Revised General Model of Information Behaviour integrates Miller's monitoring and blunting theory and Folkman's stress and coping theory, relating stress to the amount of information that is available (Wilson, 1997). Folkman's theory states that coping refers both to *the problem* causing stress as well as *the emotions* caused by stress. This dual coping

mechanism also came out in Kocevar-Weidinger et al.'s study of undergraduates, which looked at the current information skills of first year undergraduates' everyday life information seeking (ELIS) (Kocevar-Weidinger et al, 2019). They found that the two reasons for their seeking were *curiosity* and *problem solving*, showing that emotional and rational motivators are at work. Our participants stated that they often looked for information even when they knew that it was not likely going to be credible or helpful, which could be explained by Folkman's dual coping process. Participants may have been coping with their current emotions about their health, regardless of how this coping method would help solve the problem. The distinction between the two strategies is important here –while *any* information can help to cope with emotion, *credible* information is needed to solve the actual problem. Whether information can satisfy both these needs is an important consideration for information system designers and educators. Future studies might explore the link between these two needs if one exists.

We note in RQ2a that Nahl (2004, 2005) examines the role of affective coping skills in her *affective load* theory. In her study on finding measures for affective factors, Nahl found that high affective coping skills – specifically self-efficacy and optimism - were associated with better outcomes because of their ability to counteract negative emotions such as frustration and irritation when using information technology (Nahl, 2004). Nahl's study focuses on information seeking and looked at affective loads related to technology use as opposed to evaluating information. However, it is possible that these same metrics would also measure coping related to the processes of credibility checking and the ability to learn or reframe new heuristics. We found that self-efficacy was one of our trust heuristic types, a coping mechanism for overcoming stressful credibility checking processes. Optimism relates to the motivational aspect of 'interest' or 'curiosity,' which we found motivated credibility checking. Using Nahl's measurement tools to show whether these user characteristics lead to better credibility outcomes would provide a good approach in future studies of managing emotions in credibility.

Kim studied the effects of 'emotion control' on internet search behaviour and performance among undergraduate students (Kim, 2008). She used the Problem-Solving Inventory (PSI) to measure students' perception of their own emotion control and grouped them as having either

'high' or 'low' emotion control. Those with low emotion control had a significantly harder time with general tasks than those with high emotion control; this effect was not seen with specified tasks. Kim reasoned that general tasks tend to involve more uncertainty, which is often accompanied by high levels of stress, and therefore those with less emotion control would struggle more. This finding was supported in our study, both in our theme of managing emotions, as well as the impact of stress and uncertainty (particularly as incidental emotions) on credibility judgements, which we found led to less checking. Although our study focuses on credibility judgements as opposed to search performance, Kim measures performance by 'relevance' of retrieved documents, which is a closely related concept to credibility. These findings can be helpful for educational designers, who can consider both task generality and the level of emotion control of their students when designing curriculum. Whether emotion control can be developed is also an area that needs further examination for IL educators. As we saw in our literature review, overlap in influence between IL and IB is already part of the turn toward emotion in LIS. The social-constructivist approach in Lloyd's research of workplace IL helped to develop the idea of embodied information and social information spaces, including an important role for affect in the sharing and receiving of information (Lloyd, 2009). Examining the intersection of IB and IL will likely yield interesting future directions for our findings.

Our theme of 'Managing Emotions,' for example, may provide some interesting insights for competency approach to information literacy. Most frameworks have some form of information evaluation as a key competency or objective (e.g. Bundy, 2004, SCONUL, 2011; Mackey and Jacobsen, 2011; ACRL 2015). Emotional awareness and emotional competency – understanding the information one's emotions may be giving, and whether it is relevant or not – may prove a helpful addition to evaluation competencies and even information management and synthesizing competencies. The effectiveness of including emotional competencies in IL frameworks should be explored in future intervention studies.

In the past decade, IL frameworks have responded to some of the social-constructivist and affective developments in LIS, considering a role for sharing, creation, and socially constructed

value for information (UNESCO, 2013; ACRL 2015; Jacobsen et al, 2018). The American Library Association's Framework for Information Literacy for Higher Education emphasizes six interconnected core concepts that students should develop to become information literate, one of which is authority (ACRL, 2015). We saw that trust or skepticism may influence how a person judges authority in a number of ways, some of which were relevant and some which may be a product of bias by the user. Mackey and Jacobsen's Metaliteracy Framework (2011) expanded traditional information literacy to include digital and media literacies, and emphasize the social construction of information: two of the seven objectives involve evaluation as an active user and critical contributor. They are also the first IL researchers to include an affective dimension in their objectives (Attitude), likely following from the emphasis on active evaluation of dynamic content by all users. In their 2018 update to their own goals, the evaluation of one's own biases was included in evaluation, including reflecting on feelings about the learning evaluation. They also suggest leveraging motivating emotions in order to actively follow and contribute to information spaces (Jacobsen et al., 2018).

While both IL and IB research has expanded to reflect new metatheories about socially and socio-technically creating information spaces, an important consideration that emerges from Floegel's research of queer fanfiction enthusiasts: Floegel finds that emotion itself may also be hindered, shaped, or coerced by the prevailing norms and power structures of the information environment (Floegel, 2021). Subsequently, any findings that suggest emotions can be managed may have to be tested against the idea that emotions are not fully within the control of individuals but result from complex relationships of people and technologies, influencing how they are expressed to others (or the self) and how they are interpreted by others (or the self). Future studies that consider a role for education in emotional awareness or control would have to consider this added complexity. UNESCO's IL framework may provide an interesting structure to explore emotion as cultural or socially constructed (UNESCO, 2013). Cultural beliefs and emotions can influence how individuals evaluate and trust information sources, especially in the context of different cultures and societies. This holistic approach to credibility

encourages a deeper understanding of these cultural aspects and emotional influences on credibility, promoting critical thinking and cross-cultural information evaluation.

Incorporating the understanding that emotion influences credibility into these information literacy frameworks is crucial for promoting critical thinking, responsible information consumption, and effective engagement with information in today's complex and emotionally charged information landscape. By addressing the emotional aspects of information behavior and credibility assessment, these frameworks can empower learners to make well-informed decisions and become responsible digital citizens.

From a psychological perspective, Lerner et al. present several strategies for managing the influence of *incidental emotions* in decision-making (Lerner et al., 2015). The most effective strategies from the prevailing research were time-delay and reframing, although much was said about awareness of misattribution, from Schwartz and Clore's work on the influence of mood in decision-making (Schwartz and Clore, 1983)[8]. Other strategies included suppression, counteraction with other emotions, and crowding out emotions through saturation with facts. Lerner had critiques of each approach - particularly that some can have the opposite effect - showing there is still much work to do on understanding how emotions influence decisions. One strategy that stood out was choice architecture, in which the design relating to elements of choice is engineered to deal with emotional influence. While the other suggestions put the onus on the individual to learn or implement actions that mediate their own emotions, choice architecture asks designers to consider the influence of emotions in their designs. Again, these strategies assume emotions are incidental, not integral to the decision. Lerner et al. address integral emotions in their work, but do not discuss how leveraging these emotions might help make better decisions, as suggested by Schwartz in his feeling-as-information theory (Schwartz, 2012). However, it was clear in the research we have discussed so far that, in order to find any helpfulness from integral emotions, the relationship between incidental and integral emotions

[8] This work describes research relating to their 'affect-as-information' concept, which was the precursor to Schwartz's 'feeling-as-information' concept used in our theoretical framework (Schwartz, 2012).

has to be more clearly understood. Our next question will clarify some of the relationship by looking at how Context influences the roles of emotions.

5.3.3 RQ2c. What characterizes the situations in which emotion influences credibility judgements?

This question was answered by the findings related to 'Context' from Hilligoss and Rieh's framework, which included our four information topics (health, leisure, news, academic) and 6 situational factors that emerged from the interviews (importance; urgency/time constraint; convenience; current political climate; information overload; lack of information). We found that context modified how emotions influenced credibility judgements in a variety of ways through the influence of information topics and situational factors.

5.3.3.1 Information Topic as Context

In our literature review, we note that interest in Everyday Life Information Seeking (ELIS) (Savolainen, 1995) as well as Internet-based contexts was a catalyst in the inclusion of affect and emotion in LIS and IB studies (Nahl and Bilal, 2007; Kim, 2007; Fulton, 2009; Laplante and Downie, 2011; Savolainen, 2014, 2015; Loudon et al., 2016; Floegel, 2021). Health information contexts also spurred an interest in affective factors (Veinot, 2009; Lee et al., 2008; Anderson and Agarwal, 2011; Fourie and Julien, 2014; Addison, 2017). As far as Academic information, one of the earliest adopters of affect in LIS was using academic and research contexts (Kuhlthau, 1991). Therefore, it was not surprising to find that emotion played a role in all four information topics from our study, which included health, news, leisure, and academic. The role of emotion varied by topic from being part of the overall construct in the case of leisure information to motivating credibility checking in the case of health and academic information, to biasing credibility checking in news information. Emotion varied by type of emotions (incidental/integral) as well as valence of emotion.

5.3.3.2 Health Information and Incidental Emotion

Health information had the highest association with negative and incidental emotions, compared to the other three topics. Fear and worry motivated searching but hindered the ability to check credibility cues. We discussed Managing Emotion in (RQ2b), where researchers found dual needs for information: problem solving and emotional coping (Wilson, 1997; Chasiotis et al., 2019; Kocevar-Weidinger et al, 2019). In her article on HIV/AIDS health information seeking, Veinot found a similar dual purpose for information seeking; informational needs and emotional needs (Veinot, 2009). Anderson and Agrawal's study of emotion and risk in health information sharing included emotions related to the health condition as important factors in their decisions to share information (Anderson and Agarwal, 2011). They find that negative emotions about one's health related positively to their willingness to share information with stakeholders, which suggested that their incidental emotion about their health situation outweighed any integral emotion about risk in sharing information; similarly, our participants looked for information to assuage emotional needs regardless of the probability of their finding credible information.

Participants had various levels of awareness of the role of emotion in their credibility judgements, which allowed them to employ different strategies for coping with their emotions when the situation called for it. In her dissertation on health information avoidances, Addison finds that avoidance was based more on a spectrum of behaviours, rather than a binary behaviour of avoid or use (Addison, 2017). Based on various situational factors, including personality and source traits, participants varied their avoidance behaviours, avoiding certain sources under certain situations, often because of their emotional reaction to those factors. We also found an interaction between our information topic – in this case health – and the other situational factors, such as urgency or importance, that modified the role of emotion in credibility judgements. We discuss this further under the Situational Factors subsections below.

5.3.3.3 Leisure Information and Agreeableness

Leisure as a context was generally defined by our participants as more subjective, and therefore the use of one's emotions was more acceptable when judging credibility. This finding resulted in the identification of *agreeableness* as a valid construct for credibility, at least in the case of leisure information. Extending credibility to include agreeableness or pleasure at the level of Construct was a key finding and showed not only that context was important to consider when understanding emotion in credibility but also helped to support some of the reasoning behind exploring emotion in credibility in the first place: we stated in our Introduction chapter that new information landscapes required broader understanding about credibility and IB in general. The ubiquitous use of information technologies for all information needs blurs the line between entertainment and information. Some participants reported that they spend more time checking information when they are bored or in a situation where they have time to kill (on a bus, waiting in line). It could be argued that these situations, information is 'entertainment', and the overarching construct is more about pleasure or agreeableness, which could be influencing how they check for credibility in those situations. Information required for academic purposes or healthcare would not be for entertainment, and agreeableness would not likely be the overarching construct in these cases. Helping users to understand these different contexts and corresponding constructs may lead to better credibility outcomes.

LIS researchers of leisure contexts have already established the need to open some information constructs to fit different contexts (Fulton, 2009; Keilty, 2012; Laplante and Downie 2011; Solhjoo, 2022). Fulton introduces her concept of the *pleasure principle* in a study of genealogy hobbyists; she finds that "Positive affect was central to the genealogical research experience." (Fulton, 2009, p. 256). However, her hobbyists were quite serious in their pursuit, and while they may have experienced overall pleasure in finding credible information, the process of checking credibility may have included negative emotions such as skepticism or suspicion as we saw with our transportation hobbyist. Here we see one of our six situational factors at play: level of importance. One of our participants reported high levels of confirmation bias when approaching information about his transportation hobby, which made him overly critical of

those with a different point of view. His enthusiasm and strong interest towards transportation required a need for objectively or truthful information over information that was agreeable.

5.3.3.4 News Information and Confirmation Bias

For news information contexts, emotional information came from interaction with cues, as participants did not seek out news to address external needs but browsed or encountered news information on their social media feeds and aggregators. However, there was a large effect from bias and confirmation bias in news information contexts, more so than in other topics. Bias was a criterion detected by participants in the content or perceived agenda of information sources; participants reported trying to avoid sources they found to be biased and claimed to follow news sources that were 'balanced.' We discussed in RQ2b that confirmation bias also led to scrutinizing other points-of-view while favouring one's own and noted that participants' avoidance of others' biases may have had some effect on their ability to process or synthesize multiple points of view.

As with the other topics, the influence of our other situational factors plays a role: the situational factor of 'current political climate' emerged as a reason for keeping up on news and current events and implicates certain political points of view *carrying over* to different scenarios. While incidental emotion from context did not always factor, previously held political views and attitudes influenced credibility in a similar way.

5.3.3.5 Academic Information and Heuristics

Kuhlthau examined how uncertainty and stress impacted information seeking and searching in academia (Kuhlthau, 1991). Subsequent researchers looked at the role of information overload as well as library anxiety, finding many negative impacts from these affective-based factors (Mellon, 1986; Bawden and Robinson, 2009; Gremmels, 2015). Willson and Given's recent study of 20 early career academics illustrates the levels of stress inherent to academic contexts (Willson and Given, 2020). Their study used interviews over several months to understand how affect influenced new academics' IB, including information use. They found that stress led to nonuse and avoidance of information. They also found that stress led to strategizing or

'prioritizing' in an effort to reduce stress, another example of managing emotion. We found that our participants sometimes used heuristic strategies when under stress, like the 'trust bank' or using trusted sources to circumvent the more time-consuming searching and credibility checking new sources, a kind of strategizing. Willson and Given also reported that feelings of frustration dominated academic contexts, which was both a motivating and demotivation force that led to changing strategies. This is similar to our finding that emotional conflict can lead to abandoning or reframing heuristics.

We observed that the variance between positive and negative, or integral and incidental emotion depended on the other situational factors, including *importance* related to the level of care needed for an assignment, and *time constraints* based on assignment deadlines. *Lack of information* as well as *information overload* also changed how emotion influenced credibility checking. Incidental stress from deadlines reduced motivation to check credibility and increased use of heuristic strategies for finding credible information; increased interest and vigilance from importance of an assignment motivated more checking. Both lack of information and overload tended to result in negative emotional states, that could either motivate or demotivate, depending on other factors, for instance, lack of information in a scenario of high importance may lead to more checking of sources that would otherwise not be considered.

5.3.3.6 Other Situational Factors

We came up with six situational factors, which were distinct, but overlapping: importance; urgency/time constraint; convenience; current political climate; information overload; lack of information. As our data pool was limited to 18 participants, we assume that there are many more situational factors worth exploring.

Situational factors emerged based on Hilligoss and Rieh's definition of 'context ,' which: "intervene and influence credibility judgments by constraining selection of resources for a particular information seeking activity" (Hilligoss and Rieh, 2008, p. 1479). We found that context could also *enable* selection and checking, and that this was tied to the informational and motivational aspects of emotions that were often associated with these factors. For

example, time constraint nearly always resulted in restriction of checking, and the use of heuristic strategies as in the case of the trust bank, due to stress or worry about finishing on time. Importance nearly always resulted in more credibility checking, out of fear of judgement (in the case of academic assignments) or concern about health and welfare (in the case of others' health) or increased enthusiasm and interest in the subject (in the case of leisure and news). The current political climate sometimes led to a stronger interest in news topics, hence more checking, or disgust with others' points of view, leading to avoidance or more scrutiny. A lack of information sometimes led to checking sources that would otherwise be discarded; information overload could lead to heuristic processing of sources in order to make quicker and easier decisions in response to stress.

Time constraint has been examined in LIS research (Savolainen, 2006; Landry, 2016). Savolainen discusses the importance of time 1) as part of the context; 2) in relation to access; and 3) in relation to IB activities (Savolainen, 2006). Time as a moderator of access to information was closest to our conceptualization of time constraint, as something which can both enable and restrict access to information. Savolainen describes the role of time pressure in the shaping of certain behaviours and needs, for example, favouring quicker and easier methods over comprehensive ones (linking time and the use of heuristic processes). Our addition of emotional factors can further explain these behaviours as part of managing the stress associated with time constraints and avoiding the work of more lengthy processes of checking. Savolainen linked time constraint to information overload, which he described as the perception of too much information with too little time to process it. We perceived these as separate factors, since they emerged separately from our interviews.

Landry looked at the emotional effects of time constraints and *importance*, or 'high stakes' decision-making (buying a house) (Landry, 2014). Her framing of factors and their relationships was different from ours, with emotion and time constraint as distinct situational factors influencing important decisions; we framed time constraint and importance as situational factors influencing the role of emotions in credibility decisions (judgements). However, her findings are similar in that they showed a behavioural effect from the intersection of time and

emotion, that IB was more 'impulsive' and 'arbitrary.' Our participants expressed that, given a time constraint, they would often go with whatever they could find without much credibility checking.

Convenience is also related to time constraints, as convenience usually saves time and effort, but this is not exclusively the case. Research in information convenience is often related to e-commerce and refers to ease of use of websites for information and purchasing (e.g., Salehi et al., 2012). Convenience is defined emotionally by feelings of comfort and ease (e.g. Hidayat and Satria, 2020). The comfort and ease felt from a sense of convenience likely refers to an integral emotion based on the cues and features of the website. However, our finding of convenience as a situational factor was as a result of dealing with incidental feelings of stress or laziness, which led to a need for a quick and easy fix. For example, in health information, stress motivated the need for information about one's condition, but not necessarily the need for *credible* information, thus the most convenient information source was often chosen as a way to cope. Participants also chose more convenient online information over a trip to the doctor based on this same drive for immediate information, even when participants stated that a doctor was more credible than online information. Other participants felt laziness or lack of interest related to the topic, and would choose the most convenient source to get the search over with, with little regard for credibility.

The current political climate influenced the occurrence and intensity of bias and confirmation bias. According to Soon and Goh (2018) and Metzger et al. (2020) the polarization of political viewpoints lead to more intense negative emotional reactions to attitude challenging information and more intense positive emotional reactions to attitude-conforming information, making the exposure to others' ideas more difficult. When speaking about how the current political climate influenced news information credibility, participants mostly spoke with a feeling of fear about the general state of things and contempt for other points of view. These negative feelings are a manifestation of bias but also seem to reinforce or amplify bias, by continuing to make any further interaction with other points of view difficult. The ability to

manage emotions have become even more important, making a strong case for including this as an important competency in media and information literacy.

Lack of information and information overload were two sides of an equally stressful coin. Lack of information is less readily studied as an issue compared with information overload, with the growth of the Internet. However, while information may be plentiful, *credible* information is not so easily found. Our participants often cited a lack of credible information – particularly with respect to their academic assignments – as a reason for their stress or frustration, as much as information overload also caused stress. Lack of information was also associated with somewhat different emotions than information overload; both were associated with stress, but lack of information was associated with frustration and disappointment, while information overload was associated with fear. If lack of credible information is equally as important an issue as information overload, it would be beneficial to look more closely at the relationship between the two factors; some of the anxiety and stress felt from information overload related to the sense of a lack of credible or useful information.

Bawden and Robinson refer to information overload and information anxiety as 'pathologies,' leading to poor information outcomes such as avoiding and feelings of being overwhelmed (Bawden and Robinson, 2009). They also discussed how users are learning to deal with overload and anxiety by adopting strategies, such as *satisficing*. They recommend more 'control' of one's information environment as a way to manage information pathologies, such as organizing one's information spaces; our participants' 'trust bank' strategy fits into this solution. When looking for solutions, Bawden and Robinson recognize that problems in IB are not always user-based, but relate to larger contexts, such as workplace demands and educational efforts in information literacy and literacy in general.

5.3.3.7 Importance of Context

In Slovic et al.'s work on the affect heuristic, context play a key role in how affect influenced judgements and decision-making and makes the difference between the affect heuristic working well or not: "wondrous in its speed, and subtlety, and sophistication, and its ability to

'lubricate reason'; frightening in its dependency upon context and experience, allowing us to be led astray or manipulated—inadvertently or intentionally—silently and invisibly" (Slovic et al., 2006, p. 1349). They found that context was required for the affect heuristic to make sense of quantitative cues such as amounts, proportions, or costs. They demonstrated how the affect heuristic could be manipulated by situational factors, giving an example of music augmenting the experience of emotion in movies.

We also found that situational factors impacted emotion in regard to whether it is helping or hindering credibility judgement, which we discussed in RQ2b. Information topics and situational factors influenced incidental emotions, which in turn influence how integral emotions are perceived and interpreted; they also influence the depth of processing of information. Understanding how situational factors are influencing emotion helps us to fill some of the gaps in our knowledge about emotion in credibility that we may need to further explore.

Undergraduate students who are using online information for nearly all their information needs must navigate an increasing number of contexts characterized by multiple information topics and situational factors. As in the case of leisure information or information needed in urgent situations, these contexts may require faster and more efficient decision-making than required in the contexts that inspired most IL standards, which arguably assume infinite time and resources as well as academic-level importance. Although our population may spend many hours in a library researching information for assignments, they are also actively socializing (both on and offline), participating in current events and activism, seeking entertainment and engaging in hobbies, travel, and commerce. It should not be surprising that given these multiple contexts, and the growth and evolution of our information technologies, it will take stronger and more critical lenses to be able to tease apart where our emotions may be influencing credibility judgements, as well as how design and training might support better outcomes for our undergraduates.

5.4 Emotion in Hilligoss and Rieh's Framework

To illustrate where we have found evidence of the role of emotion in credibility and credibility judgement, this section will show the extension of Hilligoss and Rieh's Unifying Framework of Credibility Assessment to include emotion as a key component, based on our analysis.

As we go up the levels of framework, emotion can be said to go from very active and dynamic to more stable and embedded. Emotion on the Interaction level was often found to be reactive and unpredictable; it provided individual cues that may or may not lead to a judgement of credibility. However, it is also the level of learning, where new cues are evaluated and where more stable heuristics can be challenged and reframed in order to fit new contexts and changes in perspective. At the level of Heuristics, emotion encodes and recalls quick and easy rules for making decisions about credibility that applies across contexts. According to the affect heuristic, emotion may be the key to its efficiency and transferability, allowing it to be quickly remembered and selected (Slovic et al., 2006); however, it may also provide stability that causes one to overlook important cues in lieu of convenience and comfort.

Emotional cues at the Interaction level do not always render a credibility judgement, and require working through a process, which is not always possible or appropriate depending on the context. The ease and efficiency of heuristics allow the comfort and relief of bypassing strenuous interactive processes, when the context deems it necessary, although sometimes to the detriment of credibility. Challenging a heuristic can be uncomfortable and even painful, requiring effortful and willful desire to challenge one's own biases. Emotional cues play a crucial role in this process, alerting about the existence of a conflict. Hence, emotions are not only vital to each level, but also part of the interplay between the levels.

Construct and emotion were related in two ways: one way in regard to constructs influenced by contexts, as with the construct of agreeableness in leisure information; the other in regard to an overall 'feeling' that was associated with a credibility decision, or judgement. This is more easily understood in the distinction our participants made between *credibility*, an objective quality of information and *credibility judgement*, a subjective experience of discovering

credibility. Many of our participants reported a single feeling of finding credible information. The emotion that was felt in relation to a credibility judgment was possibly the result of 'affective calculus' accumulated over the process itself (Asutay et al., 2019). In other words, the feeling of credibility is likely the summation of emotional information from interaction and heuristic processes, showing again the interaction among the levels.

Construct and context are closely related, with the context influencing which constructs of credibility are appropriate. Context sets the parameters for which construct is used, while also enabling or restricting Interactive and heuristic credibility processes through incidental emotional information, confirmation bias, and situational factors. However, awareness of contextual factors may help to clear the way for better judgements, by understanding when, for example, agreeability is appropriate construct, or when truthfulness or trustworthiness is a better guide. Awareness of the emotions inherent in context can also mitigate some of their unintended influence.

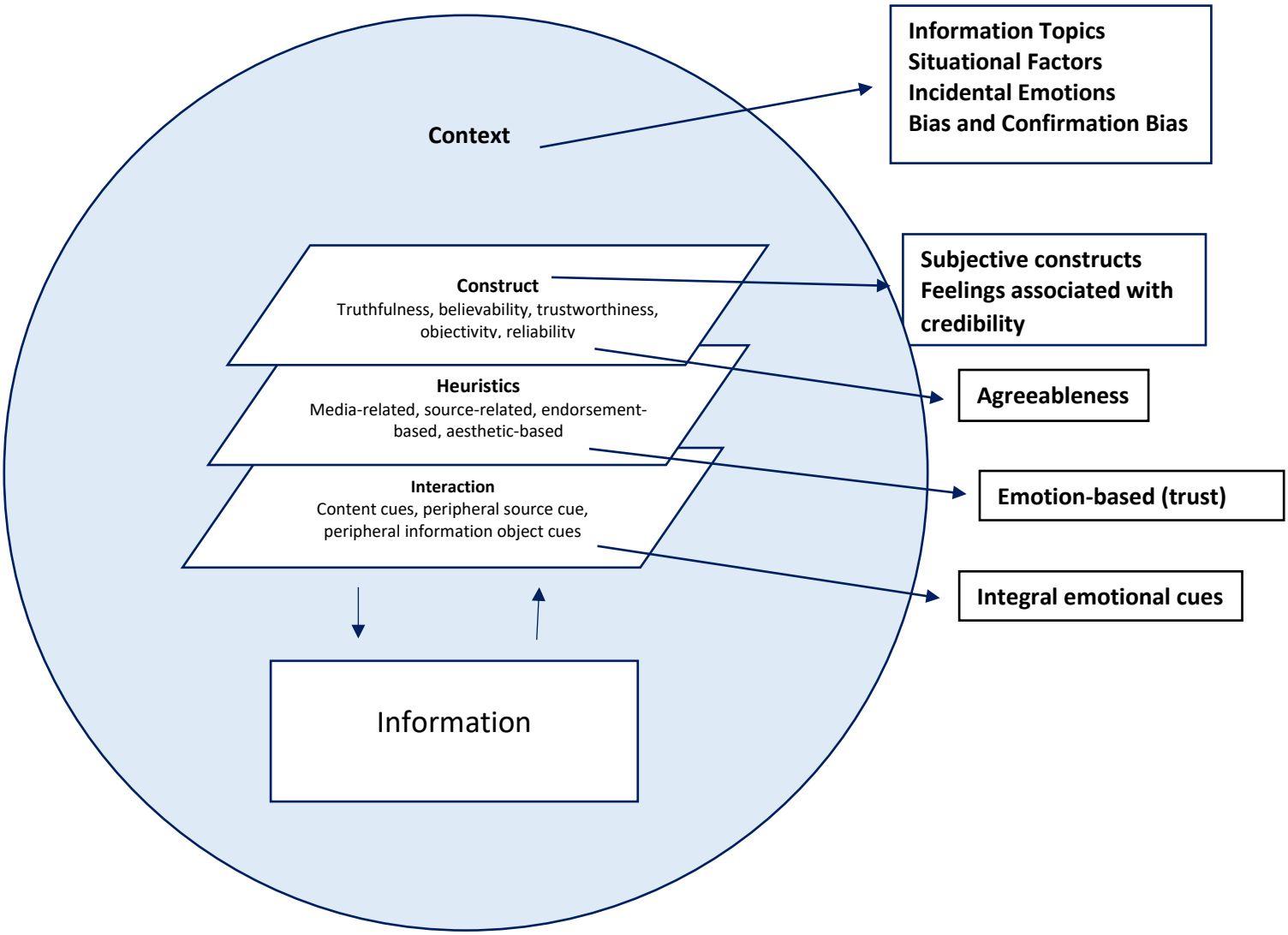
5.4.1 Extending the Framework

Table 10 shows a modified version of the table used in Hilligoss and Rieh's study to explain the components of their framework, with their original components in regular text; the bold text shows where we extended the framework to include our findings about emotion in credibility. We included a row for 'context' in the table in order to illustrate the importance of context in the discussion about emotion. Figure 26 shows the framework itself, with our added extension suggestions in the adjacent boxes.

Table 11: Explanatory table for Hilligoss and Rieh's Framework extended to include emotion (adapted from Hilligoss and Rieh, 2008, p. 1473; additions in bold)

Level	Definition	Types	Influences
Construct	Conceptualizations of credibility **that may include objective and subjective qualities** **Feelings of credibility/non-credibility based on overall emotion associated with decisions about credibility**	Truthfulness Believability Trustworthiness Objectivity Reliability **Agreeableness** **Enjoyment**	Provides a particular point of view for judging credibility **Marks final decisions of credibility or non-credibility**
Heuristic	General rules of thumb that are broadly applicable to a variety of situations **Rationales that connect criteria with constructs of credibility, encoded and supported by emotional information**	Media-related Source-related Endorsement-based Aesthetic-based **Emotion-based (e.g. trust)**	Provides useful ways of finding information conveniently and making credibility judgement quickly **Harmonizes feelings and rationale into stable rule for quick and easy decision-making**
Interaction	Specific attributes associated with particular information objects and sources for credibility, **including emotional attributes** **Process of cue valuation, which may or may not lead to judgement of credibility**	Content cues Peripheral source cues Peripheral information object cues **Integral emotional cues**	Provides specific information source or object characteristics on which to base a judgement **Provides motivation or demotivation for checking characteristics**
Context	**Attributes of the situation which enable or restrict ability to judge credibility**	**Information topic** **Situational Factors** **Incidental Emotion** **Bias**	**Can restrict or enable selection of sources, credibility checking** **Influences constructs**

Figure 25: Hilligoss and Rieh's Unifying Framework extended to include emotion (adapted from Hilligoss and Rieh, 2008, p. 1474; additions in boxes on right)



5.5 Limitations

We have shown that emotion is a key component of credibility and should be included in models or frameworks attempting to show the factors and attributes of the user with respect to judging credible information; we hope that the findings of this study spark a stronger interest in looking at the role of emotion for all future studies in credibility.

Because emotion has not been included in the research on credibility thus far, this study is exploratory in nature, using one of the broader, more encompassing frameworks, and concepts from multiple disciplines. We used a qualitative approach in order to explore in greater detail and depth, which required focusing on a smaller sample size with large, detailed data sets. We explored the importance and extent of emotion in credibility judgement, as well as the relative importance of emotion as compared to other established criteria, while also generating new criteria in a grounded approach. We also explored *how* emotion influences credibility decisions, and the situational factors that influence this. More precise methods using quantitative and experimental approaches as well as larger samples will be required to further understand the various ways emotion affects credibility decisions moving forward. We make various suggestions for future directions of more specific studies that can examine further some of our key findings in our Conclusion chapter. The following sections detail limitations for sample, measurement, method, and researcher bias.

5.5.1 Sample Limitations

We used data from 18 participants in 60- to 90-minute interviews, which gave us depth and context. Our sample size was small, although varied in terms of age and faculty; gender was balanced but limited to male and female because of the smaller sample size. Our smaller sample size also meant that our findings will require reframing into studies that use larger samples with narrower focus in order to get further into some of the relationships we observed on a broader scale. . Another aspect of larger study sample would be to look at individual differences in how emotions were felt and experienced in credibility judgements. Although we were able to show a reasonable variation in how many and how often emotions were part of

the interview data for each participant, we were not able to use this difference as a factor to explain how this may have influenced other variables, such as whether emotions helped or hindered decision-making.

Our sample was selected by convenience, meant to show diversity in age, faculty, gender, and status (international vs domestic students), and was not used to show any demographic differences in our analysis. As one of the larger universities in Canada, McGill represents a diversity of undergraduates; our own sample included international students and multilingual students, all ages from 18-24, and most faculties at McGill. However, . further studies of undergraduates in other countries, programs, and languages would be beneficial in order to take findings to the next step and look for differences among these groups. Further studies of other populations would also be advantageous, since credibility on the internet is a phenomenon impacting all ages and backgrounds.

5.5.2 Measurement tool limitations

The interview guide was developed as a guide to ensure some structure to interviews; however, the nature of emotion and self-reporting meant that much of the probing was iterative and relied on the investigator's ability to respond authentically to participants, while allowing them time and space to access their emotional memories. For this reason, interviews did not always stick to the question order for each participant. The interview often followed narrative reporting as it arose, rather than ask the participant to wait until later in the interview, as per the guide, in order not to interrupt the flow of the interviewee's thinking. However, in the interest of touching on all aspects of the interview guide, the investigator sometimes was required to redirect or cut short reporting, which may have influenced the quality of memory as the interview changed from subject to subject. In addition, participants differed in their interpretation of questions, due to cultural, linguistic, or other differences, and as a result some individual questions may have been answered unreliably, although every attempt was made to clarify terms or questions if participants showed confusion or answered in a way that suggested their interpretation of language was different than was intended. Overall themes were

supported by multiple participants reporting in a similar way, which offset some of the individual issues with interpreting the questions.

As there was only one investigator, there was consistency to the approach and iterative probing style of the interviews. However, the investigator also did all coding and analysis, thus no inter-rater reliability was established in this study. Reliability was supported through the use of a robust theoretical formwork based on well-established theory in Psychology and the literature on credibility for coding schemes and analysis, as well as the use of a semi-structured interview guide vetted by the dissertation committee. Even with a solid theoretical framework, the exploratory nature of the study required an open coding scheme that focused more on breadth and variation than grouping and categories. While we were able to identify a broad scope for looking at emotion in credibility, including multiple interrelated factors, this made some of the analysis harder. Further study might leverage some of the subcategories of Hilligoss and Rieh's framework in the analysis to look for stronger relationships between these and different types of emotion or situational factors. Along the same lines, grouping emotions into dimensions beyond valence, using Scherer's Geneva Wheel (Scherer, 2005) or using other emotional categories in the literature (e.g. Eckman, 1999) could provide some interesting insights about what kind of information emotions may be contributing.

Other limitations as to how the tool was applied may have influenced some of the responses – interviews were 60-90 mins, which can represent both a benefit and a limitation: while longer interviews provide more in-depth information, a chance for participants to think and reflect, it may also lead to some fatigue toward the end of the interview. Participants were told ahead of time how long to expect to be there and were given refreshments during the interview in order to keep them in a comfortable state, hopefully mitigating some of the fatigue. The investigator also looked for signs of fatigue and cues that participants may wish to end the interview. If interviews went past 60 mins, participants were asked if they were ok, and able to continue.

5.5.3 Self-reporting limitations

In our Theoretical Framework, we explain that self-reporting is an accepted method for accessing emotions through experiences (Scherer, 2005). Nevertheless, Self-reporting can present a limitation when collecting reliable information about emotions and credibility judgements. Self-reporting heavily relies on participants' perceptions and interpretations of their emotional experiences and information behavior. As emotions are subjective and multifaceted, individuals may have difficulty accurately recalling and expressing their emotional states, leading to potential biases and misrepresentations. Moreover, social desirability bias may influence participants to present themselves in a more socially acceptable or favorable light, impacting the authenticity of the data.

Some of the shortcomings of self-reporting can be offset using particular techniques like triangulation from other measures or ensuring that self-reports aim at real experience rather than ideas about emotions (Robinson and Clore, 2002; Lopatovska and Arapakis, 2011). Future studies should consider multiple measures in order to triangulate self-reporting findings with other indicators, however, because different measurements (e.g. biometric data, neurological data) are measuring different components of emotion, it can be difficult to use one to verify another with great accuracy. Accuracy and appropriateness of measure also depends on what kind of emotions are the target. Our findings showed that integral emotions may be giving relevant and useful information, but that much of this is to subtle or subconscious for self-reporting in the moment. In this case, biometric measures used in the moment may provide better insights, whereas incidental emotions are best measured using self-reporting, or in the case of experimental design, induced (Schwartz, 2012). Understanding participant's levels of emotional awareness was also mentioned as a useful addition to future studies of this kind.

Another consideration in measuring emotion was using dimensional or discrete measurement. Dimensional and discrete emotion approaches were used in our study. Our participants are assumed to have some reasonable access to their feelings, but not necessarily the underlying mechanics about how emotions affect their decision-making around credibility, therefore our interviews allowed for discrete emotions to be reported using natural language, while analysis

used a mapping system to categorize by valence. Future studies could consider using self-reporting tools that allow participants to categories emotions themselves, although this may also add some bias when judging where personal emotional experiences fit into standard measuring schemes (e.g. Geneva Emotion Wheel, Scherer et al., 2013).

Participants reported that emotions and other processes were likely operating at a subconscious level, which we included in our analysis.

5.5.4 Researcher Bias

Finally, the biases of the PI in the study design, in data collection, and in the analysis of findings should be acknowledged. The researcher is a white, cisgendered, English-speaking, Canadian female of a middle economic class and European heritage and carries the culture biases that accompany these identities. These biases may have influenced the development of the interview tool: emotions have differing meanings and values for individuals, and at socio-cultural levels, and this may have influenced how questions and probes were developed. However, the use of a theoretical framework employing multiple, established concepts from multiple disciplines and researchers may have helped to mitigate some of this bias. In addition all design was approved with the supervision and guidance of the dissertation committee, who share similar socio-economic backgrounds, but represent different languages, nationalities, and values, and provided a set of different perspectives that were integrated into the study design.

Qualitative interviews were highly iterative, with the investigator allowing for participants to speak freely, without judgement about their opinions or behaviours, and responding as openly and respectfully as possible. However, it is recognized that some investigator probes made in order to keep responses relevant to the topics when participants had difficulties interpreting some of the questions in the interview guide or when respondents appeared to have difficulty responding, may have been leading or suggestive of certain perspectives or values from the investigator. The investigator attempted to be self-aware of this during interviews and tried to establish reliability by asking some questions in different ways and at different stages in the interviews.

Despite these limitations, using in-depth semi-structured interviews and self-reporting provided valuable insights into the emotional experiences and information behaviors of undergraduate students. The findings can serve as a foundation for future research, allowing for a more nuanced understanding of the intricate relationship between emotions and information behavior within this particular demographic. Researchers should carefully consider these limitations and adopt appropriate strategies to enhance the rigor and reliability of qualitative studies on similar topics.

6 Conclusion

6.1 Addressing the Research Problem

The problem we are addressing is how emotion influences the credibility judgements of undergraduate students in a changing online information landscape. In answering our research questions, we found that emotion played a key role in how credibility decisions were made. This role was influenced by context including various situational factors, which impacted the extent to which emotion may be helping or hindering credibility judgements. Based on our findings, we were also able to extend Hilligoss and Rieh's Unifying Framework of Credibility Assessment to include emotion, providing a lens that can help future studies to include the influence of emotion on credibility and credibility judgements, as well as elucidate the evaluation stage in information behaviour models

6.2 Theoretical Contribution

As we stated in our introduction, LIS research was hallmarked by the turn toward user-based and social influences in IB; the addition of emotion as a key component of IB is a continuation of this turn (Hartel, 2019). Our findings demonstrate both that a theoretical lens for credibility can include emotion as a key component, and that without this component, much of the credibility checking process is obscured. . Just as our participants were not entirely conscious of the influence of emotion, credibility frameworks have not been calibrated to see this role either, leaving gaps in our understanding of the mechanisms behind credibility-related IB. Emotions were found to have been contributing informational and motivational sway that shaped decision-making around credibility, which is not visible through frameworks based entirely on rational thought process. In this finding, we also have contributed a stronger lens for understanding the evaluation stage of information seeking/searching, both in terms of providing a structure for how credibility is processed on many levels, and how emotion influences that process. This contribution will help to make future observations clearer in terms of where emotion may be helping or hindering both the IB process and credibility checking.

Another contribution, both to credibility research and LIS in general, is to show that emotion may also play an important role in systematic, critical thinking. Our finding that emotion was part of systematic cognitive processes at the Interactive level showed that, while emotion plays a role in the higher 'automatic' heuristic thinking, it also played an important role in disrupting this type of thinking, forcing participants to rethink and reframe their heuristics. The theoretical contribution of these findings was actualized by extending Hilligoss and Rieh's Unifying Framework of Credibility Assessment, which includes both systemic and heuristic processing. Further study using this extended framework to examine credibility would be an important next step in establishing a role for emotion in credibility theory.

6.3 Practical Contribution

On a practical level, we hope that by making a strong argument for including emotion in credibility theory, we can inform information users, educators, and designers with developing more robust and responsive practices that consider the bigger picture of user behaviour, context, and constructs of credibility. For example, what hitherto may have been considered irrational or uniformed behaviour may in fact be the varied influence of emotion and contextual variables as opposed to gaps in ability or knowledge about information. Teaching users how to better interpret and manage their emotions may yield better credibility outcomes, and the ability to synthesize information more robustly for oneself. In particular, future directions of information literacy research may benefit from the deep dive into the role of emotion in information evaluation, as many IL researchers have already begun to explore (e.g. Mackey and Jacobsen, 2011; ACRL, 2015). Competency models can meaningfully integrate some of the work that has begun on emotional competency and consider how emotional awareness and the ability to manage emotions may be necessary for overall information literacy competency. As emotion also characterizes social and socio-technical spaces, our findings will hopefully provide insights to this area of information literacy study as well (e.g. Lloyd, 2009)

In addition, we noted that designers should be aware of emotional influences on credibility, but also be responsible for upholding an objective standard of credibility, which has been identified by our participants as a quality they believe is out there to be discovered. Designers have a

duty to make credibility transparent and accessible – including considerations of the influence of emotion - if they claim to serve the public need for credible information.

6.4 Serving our Study Population

It is important to bring the discussion back to our overarching problem with respect to our population of undergraduate students' particular struggles with judging credibility and the capacity of LIS professionals to serve them. Our population of undergraduate students are digital natives who use the Internet as a primary platform for nearly all of their information needs. The manifold contexts and information needs (practical and emotional) are beyond the well-defined walls of the classroom or library; indeed, even these places have been implicated as influenced by emotional factors (Mellon, 1986; Willson and Given, 2020). We already know that 'Fake News,' 'Alternative Facts,' 'Click Bait, and 'Echo Chambers,' driven by algorithms that play on user sensibilities are threats to one's personal well-being and larger social and political life. Compounding the issue is research showing gaps in younger adults' ability to search for and evaluate information in online contexts. The future from this outlook seems bleak. However, the bleakness has much to do with the lens through which the problem is viewed: while it is important to address the ill-preparedness of younger adults, the scope of this discussion is limited to this point without a fuller understanding of the decision-making processes at work. The Internet, in revolutionizing how information is produced and distributed, has also allowed for unprecedented access to information, as well as extended authorship and distribution rights. It is not surprising that new skills, knowledge, and attitudes are needed when judging the credibility of information online. LIS research must support the continued development of skills, knowledge, and attitudes for our newest of-age generation by reframing credibility in terms of both cognitive and affective elements.

6.5 Summary of Key Findings and Suggestions for Future Study

The following list of ten key findings was distilled from our results and discussion. Below each finding is an associated suggestion for how these findings might be followed up with further study. As we mentioned, our study is an exploration of emotion in credibility in a broad sense; our key findings and suggestions show those places where a deeper investigation into the role

of emotion in credibility might help to develop this new approach to understanding credibility and credibility judgements.

I. *The presence of emotion in credibility and credibility judgement is extensive for our sample of undergraduate students, from individual interactions with cues, to the development and use of heuristics, to the overall constructs that guide credibility judgements, as well as the context in which information is needed and judged*.

    i. Our study focused on 18 undergraduate students who represented the McGill population at large. Studies of other populations would help establish some of our findings with more generality. Future research might also look at other well-establish models of credibility (e.g. Sundar, 2008) to see if emotion helps to explain some of the gaps in analysis from these models as well.

II. *Emotion provides information about quality based on the valence dimension of emotions. Other emotional dimensions may be providing important information with regard to credibility as well.*

    ii. As we mentioned in our discussion, applying the Appraisal Tendency Framework or another theoretical framework that considers the dimensions of the various discrete emotions that are mentioned in credibility judgements might elucidate the kind of information emotions provide beyond valence (good or bad) (Scherer et al., 2013; Lerner et al., 2015). This kind of analysis has the potential to create predictive models for experimentation, showing relationships between emotion and particular credibility outcomes.

III. *Integral and incidental emotions provide information and motivation in the process of judging credibility. This information can both help and hinder credibility judgements.*

    iii. We found that, while the understanding differences between integral and incidental emotions is crucial in understanding how they influence credibility judgements - particularly in terms of whether they help or hinder – the line between these two is blurry and should be theorized further.

IV. *The information from integral emotions is often subtle and sometimes subconscious, requiring emotional awareness and reflection for users to recognize. Individuals have*

different levels of awareness of the role of emotion in their credibility judgements. Some emotional information may not be accessible to users at all.

iv. Studies of emotion should collect data on participant levels of emotional awareness or intelligence. Using biometrics, face-tracking, and other methods of measuring emotions should be used to observe subtle emotional reactions to information. We found that our participants use emotions when they make credibility decisions, for better *and* for worse. It may be possible to hone one's ability to use emotional information and motivation toward better credibility outcomes, given a greater awareness of the influence of emotions (Scherer, 2012). As we stated in our discussion, understanding the impact of personal traits in terms of emotional awareness and emotional competency would help to understand some of the differences in awareness and ability to interpret the role of emotions in credibility judgements (e.g. Lane, 1990; Boyatsiz et al., 1999). It would also serve to support developments in information literacy competency frameworks and has already begun to be explored by the same (e.g. Jacobsen, 2018). Future studies of IL interventions that include emotional awareness or competency would help establish this finding further.

V. Emotions are more closely related to some criteria of credibility than others; this may explain some of the issues with some users valuing peripheral cues over content cues.

v. Using affective mapping and/or effective calculus theories, an examination of why certain criteria are more closely linked to, or more easily evaluated by emotion, and the overall impact of this on credibility judgement (Slovic et al., 2006; Asutay et al., 2019). This could explain some behaviours that appear to be a result of poor credibility checking but may be 'hard wired.' Rather than the approach that has been traditionally taken in LIS which assumes gaps in knowledge that can be rectified through learning skills, an approach that considers the interplay between affect and cognition may yield better outcomes.

VI. Interactions do not always lead to credibility judgements, and leaving or stopping behaviours may indicate no definitive judgement of credibility has been made.

vi. There is an important distinction between users leaving websites because of their reactions to peripheral cues and users judging information or sources as non-credible. Using an attribution principle (Schwartz, 2012) would also help to understand better what kind of information integral emotions are providing. Similarly to V, understanding this distinction means that an intervention focused on managing initial emotions and encouraging reflection on whether a judgement of credibility has been made. It overlaps with VII below, contributing to the understanding of how heuristic processing vs interactive emotional processing might be distinguished and further explored.

VII. Emotions are an important part of both the heuristic and systematic (interactive) process of judging credibility and are key to the learning processes in credibility.

vii. We know that emotion plays a key role in how credibility is judged at these levels, but also the interplay between these levels. Studies that look more closely at the relationship between the interaction stage and heuristic stage may elucidate how one influences the other, for example, how a heuristic is built up from interaction, and how interactions might challenge or reframe heuristics. The somatic marker hypothesis and the affect heuristic theory could be helpful in such studies.

VIII. Trust is a heuristic in judging credibility, based on the construct of trustworthiness. Types of trust can vary in rigour and strength. How heuristics are developed and used is supported by emotional components.

viii. Bandura's sources of self-efficacy provided useful explanations for our findings of trust-building and myth-building (Bandura, 1977). Exploring whether these sources apply across other kinds of trust and heuristics in general would be useful in understanding the mechanisms behind how these heuristics are build and reframed. Our understanding of emotion as a key component of heuristics may also help to expand Bandura's emotion as source concept, which we found to be limited to his particular research context.

IX. *The role of emotion in credibility judgements is highly context driven. Whether emotions help or hinder credibility judgements depends to a large extent on information topics, bias and confirmation bias, and other contextual factors arising from the situation.*

ix. Because context plays such an important role in how emotion influences credibility, research that looks across more information topics and populations may find a more extensive list of situational factors and perhaps some patterns or taxonomies for these factors in how they influence emotion. Related research could also look at the relationship between context and construct, showing how contextual factors influence which credibility construct is most appropriate.

X. *Dealing with emotion in credibility judgements can be difficult, and negative emotions are often important in checking credibility. It is also important to note that emotions which help with overall IB may hinder credibility checking process (and vice versa). An understanding of the overall IB context and how it may be influencing credibility checking is required to unpack this possible conflict.*

x. Further studies that can model how emotions influence the IB process including a lens on the evaluative process could explore this further.

6.6 What does credibility feel like?

The title question in this study is meant to encapsulate multiple ideas about emotion and credibility. First, it is meant to acknowledge the progress already being made in the area of emotion and decision-making in Psychology, which we have leveraged to show where emotion influences decision-making in credibility; Schwartz and Clore operationalized the idea that decisions can have an affective aspect with the question: "How do I feel about it?" (Schwartz and Clore, 1988). This approach inspired the 'risk-as-feeling' area of study, the affect heuristic and many other approaches that seek to define a larger role for emotion as contributing important information when making decisions (Lowenstein et al, 2001; Slovic et al, 2006).

Second, the question points to something that we intuitively understand, but rarely acknowledge: we make decisions as much with our feelings as with our thoughts in the real world. How do we decide which qualities of a thing are desirable and which are not? What

stops the endless weighing of options before the deadline arrives and moves us to choose? How do we make a final decision when we have little or no information about something? How to we evaluate whether something is the right fit for our specific, personal needs? These questions relate to judgements about credibility as with any other type of decisions. Just *how* and *how much* emotion plays a role in how we answer these depends on many factors, which we have explored in our study. Whether or not this is presents and help or a hinderance to our ability to judge credibility is also something we have explored, enough to show that it is both and warrants further study if we wish to support their adaptation to new information landscapes.

7 Bibliography

Alrubaian, M., Al-Qurishi, M., Alamri, A., Al-Rakhami, M., Hassan, M. M., and Fortino, G. (2018). Credibility in online social networks: A survey. *IEEE Access*, *7*, 2828-2855.

Anderson, C. L., and Agarwal, R. (2011). The digitization of healthcare: boundary risks, emotion, and consumer willingness to disclose personal health information. *Information Systems Research*, *22*(3), 469-490.

Arapakis, I., Jose, J. M., and Gray, P. D. (2008, July). Affective feedback: an investigation into the role of emotions in the information seeking process. In *Proceedings of the 31st annual international ACM SIGIR conference on Research and development in information retrieval* (pp. 395-402).

Association of College and Research Libraries. (2000). *Information Literacy Competency Standards in Higher Education*. Chicago: Association of College and Research Libraries.

Association of College & Research Libraries. (2015). Framework for Information Literacy for Higher Education.

Bales, R.F. (1950), *Interaction Process Analysis. A Method for the Study of Small Groups*, Addison-Wesley Press, Cambridge, MA.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191.

Barrett, L. F. (2006). Valence is a basic building block of emotional life. *Journal of Research in Personality, 40*(1), 35–55.

Bartlett, J. C., Frissen, I., and Beheshti, J. (2020, March). Comparing Academic and Everyday-Life Information Seeking Behavior Among Millennial Students. In *Proceedings of the 2020 Conference on Human Information Interaction and Retrieval* (pp. 402-406).

Bartlett, J.C., Kumah, C., Couch, A., and Beheshti, J. (2018). How do millennials find health information? A study of everyday-life health information seeking. Presented at the *Canadian Health Libraries Association Annual Conference*, St. John's, NL, June 15-18.

Bawden, D., and Robinson, L. (2009). The dark side of information: overload, anxiety and other paradoxes and pathologies. *Journal of information science*, *35*(2), 180-191.

Beheshti, J., Bartlett, J.C., Couch, A., and Kumah, C. (2018). A comparative analysis of information seeking behaviour of Canadian and international secondary school graduates entering a university. Presented at the *International Association of School Librarianship Annual Conference*, Istanbul, May 6-11.

Bent, M., and Stubbings, R. (2011). *The SCONUL seven pillars of information literacy: Core model for higher education*. SCONUL Working Group on Information Literacy.

Björneborn, L. (2011, August). Behavioural traces and indirect user-to-user mediation in the participatory library. In *Proceedings of the International Conference on Information Science and Social Media* (pp. 151-166).

Bodenhausen, G. V. (1993). Emotions, arousal, and stereotypic judgments: A heuristic model of affect and stereotyping. In *Affect, cognition and stereotyping* (pp. 13-37). Academic Press.

Bozinovski, S. (2018). Cognition-emotion primacy debate and Crossbar Adaptive Array in 1980-1982. *Procedia computer science*, *145*, 105-111.

Brinkmann, S. (2014). Unstructured and semi-structured interviewing. *The Oxford handbook of qualitative research*, 277-299.

Bundy, A. (Ed.). (2004). Australian and New Zealand Information Literacy Framework: Principles, Standards, and Practice. 2nd edition.

Byström, K., & Järvelin, K. (1995). Task complexity affects information seeking and use. Information processing & management, 31(2), 191-213.

Charland, L. C. (2005). The heat of emotion: Valence and the demarcation problem. *Journal of consciousness studies*, *12*(8-9), 82-102.

Chasiotis, A., Wedderhoff, O., Rosman, T., and Mayer, A. K. (2019). The Role of Approach and Avoidance Motivation and Emotion Regulation in Coping Via Health Information Seeking. *Current Psychology*, 1-10.

Chatman, E. A. (1991). Life in a small world: Applicability of gratification theory to information-seeking behavior. *Journal of the American Society for Information Science, 42*(6), 438–449.

Chatman, E. (1996). The impoverished life-world of outsiders. *Journal of the American Society for Information Science*, *47*(3), 193–206.

Chatman, E. A. (2000). Framing social life in theory and research. *The New Review of Information Behaviour Research, 1*, 3-17.

Cho, J. H., Chan, K., & Adali, S. (2015). A survey on trust modeling. *ACM Computing Surveys (CSUR)*, *48*(2), 1-40.

Christianson, S. A. (Ed.). (2014). *The handbook of emotion and memory: Research and theory*. New York: Psychology Press.

Chung, W., and Zeng, D. (2020). Dissecting emotion and user influence in social media communities: An interaction modeling approach. *Information and Management*, *57*(1), 103108.

Clore, G. L., Gasper, K., and Garvin, E. (2001). Affect as information. *Handbook of affect and social cognition*, 121-144.

Clore, G. L., and Storbeck, J. (2006). *Affect as information about liking, efficacy, and importance*. New York: Psychology Press.

Costello, K. L. (2016). Impact of patient‐provider communication on online health information behaviors in chronic illness. Proceedings of the Association for Information Science and Technology, 53(1), 1-10.

Cox, A. M., Griffin, B., & Hartel, J. (2017). What everybody knows: embodied information in serious leisure. Journal of Documentation, 73(3), 386-406.

Creswell, J. W. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.

Cronin, B. (2008). The sociological turn in information science. *Journal of information science*, *34*(4), 465-475.

Dalqvist, C. (2022). Understanding information-seeking achievement emotions - exploring a cognitive appraisal theory framework. *Information research, 27*(special issue).

Damasio, A. (1994). *Descartes' Error: Emotion, Reason, and the Human Brain*, New York: Putnam Publishing.

De Houwer, J., and Hermans, D. (2010). Do feelings have a mind of their own? In *Cognition and Emotion* (pp. 48-75). Psychology Press.

Dervin, B. (1992). From the mind's eye of the user: The sense-making qualitative-quantitative methodology. In J.D. Glazier and R.R. Powell (Eds.), *Qualitative research in information management*, Englewood, CO: Libraries Unlimited, 61-84.

Dervin, B. (1999). Chaos, order, and sense-making: A proposed theory for information design. *Information design*, 35-57.

Dervin, B., and Reinhard C.D. (2007). How emotional dimensions of situated information seeking relate to user evaluations of help from sources: An exemplar study informed by sense-making methodology. In D. Nahl and D. Bilal (Eds.), *Information and emotion: The emergent affective paradigm in information behavior research and theory* (pp. 51-84). Medford, NJ: Information Today, Inc.

Ekman, P. (1999). Basic Emotions. In T. Dalgleish and T. Power (Eds.) The Handbook of Cognition and Emotion Pp. 45–60. Sussex, U.K.: John Wiley & Sons, Ltd.

Evans, M. M. (2013). Is trust the most important human factor influencing knowledge sharing organisations? *Journal of Information & Knowledge Management*, *12*(04), 1350038.

Evans, M. M., Frissen, I., & Wensley, A. K. (2018). Organisational information and knowledge sharing: Uncovering mediating effects of perceived trustworthiness using the PROCESS approach. *Journal of Information & Knowledge Management*, 17(01), 1850001.

Finucane, M. L. (2008). Emotion, affect, and risk communication with older adults: challenges and opportunities. *Journal of risk research*, *11*(8), 983-997.

Finucane, M. L., Alhakami, A., Slovic, P., and Johnson, S. M. (2000). The affect heuristic in judgments of risks and benefits. *Journal of behavioral decision making*, *13*(1), 1-17.

Fisher, K.E. and Landry, D.F. (2007). Understanding the Information Behavior of Stay-at-Home Mothers. In Nahl and Bilal (Eds.), *Information and emotion: The emergent affective paradigm in information behavior research and theory*. (211-233). New Jersey: Information Today, Inc.

Fisher, K. E., Landry, C. F., & Naumer, C. M. (2007). Social spaces, casual interactions, meaningful exchanges: An information ground typology based on the college student experience. Information Seeking in Context VI (ISIC). Sydney, Australia, July 2006.

Fisher, K.E., and Naumer, C.M. (2006). Information Grounds: Theoretical basis and empirical findings on information flow in social settings. In A. Spink and C. Cole (Eds.), New directions in human information behavior (pp. 93-111). Amsterdam: Kluwer.

Fitzgerald, S. R. (2018). The role of affect in the information seeking of productive scholars. *The Journal of Academic Librarianship*, *44*(2), 263-268.

Flanagin, A. J., and Metzger, M. J. (2000). Perceptions of Internet information credibility. *Journalism and Mass Communication Quarterly*, *77*(3), 515-540.

Flanagin, A. J., and Metzger, M. J. (2007). The role of site features, user attributes, and information verification behaviors on the perceived credibility of web-based information. *New Media and Society*, *9*(2), 319-342.

Floegel, D. (2021). Investigating structural articulations of power in information creation: a constructivist grounded theory of queer-created fanfiction (Doctoral dissertation, Rutgers University-School of Graduate Studies).

Fogg, B. J. (2003, April). Prominence-interpretation theory: Explaining how people assess credibility online. In *CHI'03 extended abstracts on human factors in computing systems* (pp. 722-723). ACM.

Fogg, B. J., Marshall, J., Osipovich, A., Varma, C., Laraki, O., Fang, N., ... Treinen, M. (2000, April). Elements that affect web credibility: Early results from a self-report study. In *CHI'00 extended abstracts on human factors in computing systems* (pp. 287-288).

Fogg, B. J., Soohoo, C., Danielson, D. R., Marable, L., Stanford, J., and Tauber, E. R. (2003, June). How do users evaluate the credibility of Web sites? a study with over 2,500 participants. In *Proceedings of the 2003 conference on Designing for user experiences* (pp. 1-15). ACM.

Fogg, B. J., and Tseng, H. (1999, May). The elements of computer credibility. In *Proceedings of the SIGCHI conference on Human Factors in Computing Systems* (pp. 80-87).

Fossum, T. A., and Barrett, L. (2000). Distinguishing evaluation from description in the personality–emotion relationship. *Personality and Social Psychology Bulletin, 26*(6), 669–678.

Fourie, I. (2009). Learning from research on the information behaviour of healthcare professionals: a review of the literature 2004–2008 with a focus on emotion. *Health Information and Libraries Journal*, *26*(3), 171-186.

Fourie, I., & Julien, H. (2014). Ending the dance: a research agenda for affect and emotion in studies of information behaviour. *Information Research, 19*(4).

Friedman, B., Khan Jr, P. H., & Howe, D. C. (2000). Trust online. *Communications of the ACM*, *43*(12), 34-40.

Frijda, N. H., Kuipers, P. and Ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of personality and social psychology*, *57*(2), 212.

Fulton, C. (2009, May). The pleasure principle: the power of positive affect in information seeking. In *Aslib Proceedings: New Information Perspectives*. 61(3), 245-261.

George, J. M., & Dane, E. (2016). Affect, emotion, and decision making. *Organizational Behavior and Human Decision Processes, 136*, 47-55.

Ginsca, A. L., Popescu, A., and Lupu, M. (2015). Credibility in information retrieval. *Foundations and Trends® in Information Retrieval*, *9*(5), 355-475.

Given, L. M. (Ed.) (2008). Probes and Probing. In *The SAGE encyclopedia of qualitative research methods* (Vols. 1-0). Thousand Oaks, CA: SAGE Publications, Inc.

Given, L. M., Case, D. O., & Willson, R. (2023). Looking for information : Examining research on how people engage with information. Emerald Publishing Limited

Glaser, B. G. and Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. New York: Aldine De Gruyter.

Godbold, N. (2013). An information need for emotional cues: Unpacking the role of emotions in sense making. *Information Research, 18*(1)

Gremmels, G. S. (2015). Constance Mellon's "Library Anxiety": An appreciation and a critique. *College and Research Libraries*, *76*(3), 268-275.

Griffin, R. J., Dunwoody, S., & Neuwirth, K. (1999). Proposed model of the relationship of risk information seeking and processing to the development of preventive behaviors. *Environmental research*, *80*(2), S230-S245.

Gross, M., and Latham, D. (2012). What's skill got to do with it?: Information literacy skills and self-views of ability among first-year college students. *Journal of the American Society for Information Science and Technology*, *63*(3), 574-583.

Guo, J., Wang, X., and Wu, Y. (2020). Positive emotion bias: Role of emotional content from online customer reviews in purchase decisions. *Journal of Retailing and Consumer Services*, *52*, 101891.

Gursoy, D. (2018). A critical review of determinants of information search behavior and utilization of online reviews in decision making process (invited paper for 'luminaries' special issue of International Journal of Hospitality Management). *International Journal of Hospitality Management*, *76*, 53-60.

Gwizdka, J., and Lopatovska, I. (2009). The role of subjective factors in the information search process. *Journal of the American Society for Information Science and Technology*, *60*(12), 2452-2464.

Hartel, J. (2019). Turn, Turn, Turn. *Information research, 24*(4).

Hayter, S. (2007). The affective dimensions of information behaviour: A small world perspective. In Nahl and Bilal (Eds.), *Information and emotion: The emergent affective paradigm in information behavior research and theory*. (255-267). New Jersey: Information Today, Inc.

Heinström, J. (2002). *Fast surfers, broad scanners and deep divers: Personality and information-seeking behaviour*. Abo: Abo Akademi University Press.

Heinström, J. (2003). Five personality dimensions and their influence on information behaviour. *Information research*, *9*(1), 9-1.

Heinström, J. (2010). *From fear to flow: personality and information interaction*. Oxford: Elsevier.

Hilligoss, B., and Rieh, S. Y. (2008). Developing a unifying framework of credibility assessment: Construct, heuristics, and interaction in context. *Information Processing and Management*, *44*(4), 1467-1484.

Hsee, C. K. (1996). The evaluability hypothesis: An explanation for preference reversals between joint and separate evaluations of alternatives. *Organizational behavior and human decision processes*, *67*(3), 247-257.

Huttunen, A. (2023). “I had to teach my own doctor what this was about”: Information sharing barriers and information evaluation of Finnish transgender people. *Library & Information Science Research, 45*(2), 101235.

Hyvärinen, H., and Beck, R. (2018, January). Emotions Trump Facts: The Role of Emotions in on Social Media: A Literature Review. In *Proceedings of the 51st Hawaii International Conference on System Sciences*.

Johnson, D., and Grayson, K. (2005). Cognitive and affective trust in service relationships. *Journal of Business research*, *58*(4), 500-507.

Johnson, E. J., and Tversky, A. (1983). Affect, generalization, and the perception of risk. *Journal of personality and social psychology*, *45*(1), 20.

Julien, H., and Fourie, I. (2015). Reflections of affect in studies of information behavior in HIV/AIDS contexts: An exploratory quantitative content analysis. *Library and Information Science Research*, *37*(1), 3-9.

Julien, H., Pecoskie, J. J., and Reed, K. (2011). Trends in information behavior research, 1999–2008: A content analysis. *Library and Information Science Research*, *33*(1), 19-24.

Kapitzke, C. (2003). Information literacy: a review and poststructural critique. *Australian Journal of Language and Literacy*, *26*(1), 53-66.

Karanasios, S., & Zorina, A. (2023). From participation roles to socio‐emotional information roles: Insights from the closure of an online community. *Journal of the Association for Information Science and Technology, 74*(1), 33-49.

Keilty, P. (2012). Embodiment and desire in browsing online pornography. In *Proceedings of the 2012 iConference* February 7-10, Toronto, ON, Canada (pp. 41-47).

Kim, K. S. (2008). Effects of emotion control and task on Web searching behavior. *Information Processing and Management*, *44*(1), 373-385.

Kim, K. S., and Allen, B. (2002). Cognitive and task influences on Web searching behavior. *Journal of the American Society for Information Science and Technology*, *53*(2), 109-119.

Kim, K. S., and Sin, S. C. J. (2011). Selecting quality sources: Bridging the gap between the perception and use of information sources. *Journal of Information Science*, *37*(2), 178-188.

Kim, K. S., and Sin, S. C. J. (2016). Use and evaluation of information from social media in the academic context: Analysis of gap between students and librarians. *The Journal of Academic Librarianship*, *42*(1), 74-82.

Kim, K.-S., Sin, S.-C. J., and Yoo-Lee, E. Y. (2014). Undergraduates' Use of Social Media as Information Sources. *College and Research Libraries, 75*(4), 442-457.

Krakowska, M. (2020). Affective factors in human information behavior: a conceptual analysis of interdisciplinary research on information behavior. *Zagadnienia Informacji Naukowej–Studia Informacyjne, 58*(1A (115A)), 75-95.

Kranzbühler, A. M., Zerres, A., Kleijnen, M. H., & Verlegh, P. W. (2020). Beyond valence: A meta-analysis of discrete emotions in firm-customer encounters. *Journal of the Academy of Marketing Science*, *48*(3), 478-498.

Krippendorff, K. (1980). *Reliability*. John Wiley and Sons, Inc.

Kuhlthau, C. C. (1991). Inside the search process: Information seeking from the user's perspective. *Journal of the American society for information science*, *42*(5), 361.

Landry, C. F. (2014). *The Impacts of Time Pressure and Emotion on the Information Behavior of High Stakes Decision Makers: The Home Buying Experience* (Doctoral dissertation). Seattle: University of Washington.

Lane, R. D., Quinlan, D. M., Schwartz, G. E., Walker, P. A., and Zeitlin, S. B. (1990). The Levels of Emotional Awareness Scale: A cognitive-developmental measure of emotion. *Journal of personality assessment*, *55*(1-2), 124-134.

Laplante, A., and Downie, J.S. (2011). The utilitarian and hedonic outcomes of music information-seeking in everyday life. *Library and Information Science Research*, *33*, 202-210.

Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press on Demand.

Lee, S. Y., Hwang, H., Hawkins, R., and Pingree, S. (2008). Interplay of negative emotion and health self-efficacy on the use of health information and its outcomes. *Communication Research*, *35*(3), 358-381.

Lerner, J. S., and Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition and Emotion*, *14*(4), 473-493.

Lerner, J. S., Li, Y., Valdesolo, P., & Kassam, K. S. (2015). Emotion and decision making. *Annual review of psychology*, *66*, 799-823.

Lewicki, R. J., and Brinsfield, C. H. A. D. (2011). Framing trust: trust as a heuristic. *Framing matters: Perspectives on negotiation research and practice in communication*, 110-135.

Lingel, J. and boyd, D. (2013). 'Keep it secret, keep it safe': information poverty, information norms, and stigma. *Journal of the American Society for Information Science and Technology, 64*(5), 981-991.

Lipshitz, R., and Shulimovitz, N. (2007). Intuition and emotion in bank loan officers' credit decisions. *Journal of Cognitive Engineering and Decision Making*, *1*(2), 212-233.

Lloyd, A. (2006). Information literacy landscapes: an emerging picture. *Journal of Documentation*, *62*(5), 570-583.

Lloyd, A. (2009). Informing practice: information experiences of ambulance officers in training and on-road practice. Journal of Documentation, 65 (3), 396-419.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., and Welch, N. (2001). Risk as feelings. *Psychological bulletin*, *127*(2), 267.

Lopatovska, I. (2014). Toward a model of emotions and mood in the online information search process. *Journal of the Association for Information Science and Technology*, *65*(9), 1775-1793.

Lopatovska, I., and Arapakis, I. (2011). Theories, methods and current research on emotions in library and information science, information retrieval and human–computer interaction. *Information Processing and Management*, *47*(4), 575-592.

Loudon, K., Buchanan, S., and Ruthven, I. (2016). The everyday life information seeking behaviours of first-time mothers. *Journal of documentation*. 72(1), 24-46.

Lueg, C. P. (2015). The missing link: Information behavior research and its estranged relationship with embodiment. *Journal of the Association for Information Science and Technology*, *66*(12), 2704-2707.

Lufityanto, G., Donkin, C., and Pearson, J. (2016). Measuring intuition: nonconscious emotional information boosts decision accuracy and confidence. *Psychological science*, *27*(5), 622-634.

Mackey, T. P., and Jacobson, T. E. (2011). Reframing information literacy as a metaliteracy. College and research libraries, 72(1), 62-78.

Jacobson, T., Mackey, T., O'Brien, K., Forte, M., & O'Keeffe, E. (2018). 2018 metaliteracy goals and learning objectives. Metaliteracy.

Mauss, I. B., and Robinson, M. D. (2009). Measures of emotion: A review. Cognition and *Emotion*, *23*(2), 209–237.

Mayer, R. C., Davis, J. H., and Schoorman, F. D. (1995). An integrated model of organizational trust. *Academy of Management Review, 20*, 709-739.

Mehrabian, A. (1995). Framework for a comprehensive description and measurement of emotional states. *Genetic, Social, and General Psychology Monographs, 121*(3), 339-61.

Metzger, M. J., and Flanagin, A. J. (2013). Credibility and trust of information in online environments: The use of cognitive heuristics. *Journal of Pragmatics, 59*, 210-220.

Metzger, M. J., and Flanagin, A. J. (2015). Psychological approaches to credibility assessment online. *The handbook of the psychology of communication technology*, *32*, 445.

Metzger, M. J., Flanagin, A. J., and Medders, R. B. (2010). Social and heuristic approaches to credibility evaluation online. *Journal of Communication*, *60*(3), 413-439.

Metzger, M. J., Flanagin, A. J., and Zwarun, L. (2003). College student Web use, perceptions of information credibility, and verification behavior. *Computers and Education*, *41*(3), 271-290.

Myrick, J. G., & Willoughby, J. F. (2017). Educated but anxious: How emotional states and education levels combine to influence online health information seeking. *Health Informatics Journal*, *25*(3), 649-660.

Moshfeghi, Y., and Jose, J. M. (2013, July). An effective implicit relevance feedback technique using affective, physiological and behavioural features. In *Proceedings of the 36th international ACM SIGIR conference on Research and development in information retrieval* (pp. 133-142).

Morgan, D. L. (1998). Practical strategies for combining qualitative and quantitative methods: Applications to health research. *Qualitative Health Research*, *8*(3), 362-376.

Nahl, D. (1997). The user-centered revolution: 1970-1995. In A. Kent and J. G. Williams (Eds), *Encyclopedia of Microcomputers*, *19*, 143-99.

Nahl, D. (1998b). Learning the Internet and the structure of information behavior. *Journal of the American Society for Information Science*, *49*(11), 1017-1023.

Nahl, D. (2007). Social–biological information technology: An integrated conceptual framework. *Journal of the Association for Information Science and Technology*, *58*(13), 2021-2046.

Nahl, D., and Bilal, D. (Eds.). (2007). *Information and emotion: The emergent affective paradigm in information behavior research and theory*. New Jersey: Information Today, Inc.

Nahl, D., and Tenopir, C. (1996). Affective and cognitive searching behavior of novice end-users of a full-text database. *Journal of the American Society for Information Science*, *47*(4), 276-286.

Ortony, A., Clore, G. L., and Collins, A. (1988). *The Cognitive Structure of Emotions*. Cambridge University Press.

Pettigrew, K.E. (1999). Waiting for chiropody: contextual results from an ethnographic study of the information behavior among attendees at community clinics. *Information Processing & Management*, 3(6), 801-817

Petty, R. E., & Cacioppo, J. T. (1986). The Elaboration Likelihood Model of persuasion. *Advances in Experimental Social Psychology,* 19, 123–205.

Phelps, E. A., Ling, S., and Carrasco, M. (2006). Emotion facilitates perception and potentiates the perceptual benefits of attention. *Psychological Science*, *17*(4), 292-299.

Poels, K., & Dewitte, S. (2019). The role of emotions in advertising: A call to action. *Journal of Advertising, 48*(1), 81-90.

Quartz, S. R. (2009). Reason, emotion and decision-making: risk and reward computation with feeling. *Trends in Cognitive Sciences*, *13*(5), 209-215.

Reisenzein, R. (2019). Cognition and emotion: A plea for theory. *Cognition and Emotion*, *33*(1), 109-118.

Ren, G., and Hong, T. (2018). Examining the relationship between specific negative emotions and the perceived helpfulness of online reviews. *Information Processing and Management*, *56*(4), 1425-1438.

Rieh, S. Y., and Danielson, D. R. (2007). Credibility: A multidisciplinary framework. *Annual review of information science and technology*, *41*(1), 307-364.Robinson, M. D., & Clore, G. L. (2002). Belief and feeling: evidence for an accessibility model of emotional self-report. Psychological bulletin, 128(6), 934–960.Roseman, I. J., Spindel, M. S., and Jose, P. E. (1990). Appraisals of emotion-eliciting events: Testing a theory of discrete emotions. *Journal of Personality and Social Psychology, 59,* 5, 899-915.

Saldana, J. (2016). *The Coding Manual for Qualitative Researchers 3rd Ed*. London: Sage.

Saunders, L., Severyn, J., and Caron, J. (2017). Don't they teach that in high school? Examining the high school to college information literacy gap. *Library and Information Science Research*, *39*(4), 276-283.

Savolainen, R. (1993). The sense-making theory: Reviewing the interests of a user-centered approach to information seeking and use. *Information Processing & Management*, *29*(1), 13-28.

Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the context of "way of life". *Library and Information Science Research*, *17*(3), 259-294.

Savolainen, R. (2007). Filtering and withdrawing: strategies for coping with information overload in everyday contexts. *Journal of Information Science*, *33*(5), 611-621.

Savolainen, R. (2011). Judging the quality and credibility of information in Internet discussion forums. *Journal of the American Society for Information Science and Technology*, *62*(7), 1243-1256.

Savolainen, R. (2014). Emotions as motivators for information seeking: A conceptual analysis. *Library and Information Science Research*, *36*(1), 59-65.

Savolainen, R. (2015a). The role of emotions in online information seeking and sharing: a case study of consumer awareness. *Journal of Documentation*, *71*(6), 1203-1227.

Savolainen, R. (2015b). The interplay of affective and cognitive factors in information seeking and use: Comparing Kuhlthau's and Nahl's models. *Journal of Documentation, 71*(1), 175-197.

Savolainen, R. (2015c). Approaching the affective factors of information seeking: The viewpoint of the information search process model. *Information Research, 20*(1).

Savolainen, R. (2016). Approaching the affective barriers to information seeking: the viewpoint of appraisal theory. *Information Research, 21*(4).

Savolainen, R. (2022). Everyday life as an evolving context of information behaviour. Aslib Journal of Information Management, (ahead-of-print).Scherer, K. R. (2005). What are emotions? And how can they be measured? *Social Science Information*, *44*(4), 695-729.

Scherer, K., Schorr, A., and Johnstone, T. (Eds.). (2001). *Appraisal processes in emotion: Theory, methods, research*. New York: Oxford University Press.

Scherer, K.R., Shuman, V., Fontaine, J.R.J, & Soriano, C. (2013). The GRID meets the Wheel: Assessing emotional feeling via self-report. In Johnny R.J. Fontaine, Klaus R. Scherer & C. Soriano (Eds.), Components of Emotional Meaning: A sourcebook (pp. 281-298). Oxford: Oxford University Press.

Schlosberg, H. (1954). Three dimensions of emotion. *Psychological Review*, *61*(2), 81.

Schwarz, N. (2012). Feelings-as-information theory. In P. A. M. Van Lange, A. W. Kruglanski, and E. T. Higgins (Eds.), *Handbook of Theories in Social Psychology*. Thousand Oaks, CA: SAGE, 289-308.

Schwarz, N., and Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of personality and social psychology*, *45*(3), 513.

Schwarz, N. and Clore, G. (1988). How do I feel about it? Informative functions of affective states. In K. Fieldler, J. Forgas (Eds.), *Affect, Cognition and Social Behavior: New Evidence and Integrative Attempts*. Toronto: C.J. Hogrefe.

Shiv, B., Loewenstein, G., and Bechara, A. (2005). The dark side of emotion in decision-making: When individuals with decreased emotional reactions make more advantageous decisions. *Cognitive Brain Research*, *23*(1), 85-92.

Shuman, V., Sander, D., and Scherer, K. R. (2013). Levels of Valence. *Frontiers in Psychology*, *4*, 261.

Siemer, M. and Reisenzein, R. (1998). Effects of Mood on Evaluative Judgements: Influence of Reduced Processing Capacity and Mood Salience, *Cognition and Emotion, 12*(6), 783-805.

Siegrist, M. (2021). Trust and risk perception: A critical review of the literature. *Risk Analysis*, 41(3), 480-490.

Sin, S. C. J., and Kim, K. S. (2013). International students' everyday life information seeking: The informational value of social networking sites. *Library and Information Science Research*, *35*(2), 107-116.

Singh, A., Gibbs, J., and Blandford, A. (2019, May). Emotion and Experience in Negotiating HIV-Related Digital Resources: " It's not just a runny nose!" In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1-14).

Slovic, P., Melissa L. Finucane, E. P., and MacGregor, D.G (2007). The affect heuristic. *European journal of operational research, 177*(3): 1333-1352.Smith, C. A., and Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of personality and social psychology*, *48*(4), 813.

Solhjoo, N. (2022). "I can tell he is in a good mood." Embodied aspects of information in human-animal relationship. *Information research, 27*(special issue).

Somerville, M., & Lloyd, A. (2006). Codified knowledge and embodied learning: The problem of safety training. Studies in Continuing Education, 28(3), 279-289.

Spink, A., & Cole, C. (2006). Human information behavior: Integrating diverse approaches and information use. *Journal of the American Society for information Science and Technology*, *57*(1), 25-35.

Spink, A.; Ozmutlu, H. C.; and Lorence, D. P. (2004). Web searching for sexual information: An exploratory study. *Information Processing and Management, 40*(1), 113-124.

Stefanucci, J. K., Gagnon, K. T., and Lessard, D. A. (2011). Follow your heart: Emotion adaptively influences perception. *Social and personality psychology compass*, *5*(6), 296-308.

Stvilia, B., Gasser, L., Twidale, M. B., and Smith, L. C. (2007). A framework for information quality assessment. *Journal of the American society for information science and technology*, *58*(12), 1720-1733.

Sundar, S. (2008). The MAIN Model: A Heuristic Approach to Understanding Technology Effects on Credibility. *Digital Media, Youth, and Credibility*. M. Metzger and A. Flanagin (Eds). *The*

John D. and Catherine T. MacArthur Foundation Series on Digital Media and Learning. Cambridge, MA: The MIT Press. 73–100.

Sung, Y., & Kim, J. (2010). Effects of brand personality on brand trust and brand affect. *Psychology & Marketing*, *27*(7), 639-661.

Teddlie, C., and Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of mixed methods research*, *1*(1), 77-100.

Tiedens, L. Z., and Linton, S. (2001). Judgment under emotional certainty and uncertainty: the effects of specific emotions on information processing. *Journal of personality and social psychology*, *81*(6), 973.

Tsai, J. Y. (2014). *How we feel matters: Toward an integrative model of emotions, cognition, risk information seeking and processing* (Doctoral dissertation, The University of Wisconsin-Madison).

Tsai, M-J., and Tsai, C-C. (2003). Information searching strategies in web-based science learning: The role of Internet self-efficacy. *Innovations in education and Teaching International, 40*(1), 43-50.

Tugade, M. M., Shiota, M. N., & Kirby, L. D. (Eds.). (2014). *Handbook of positive emotions*. Guilford Publications.

Västfjäll, D., Slovic, P., Burns, W. J., Erlandsson, A., Koppel, L., Asutay, E., & Tinghög, G. (2016). The arithmetic of emotion: Integration of incidental and integral affect in judgments and decisions. Frontiers in psychology, 7, 325.

UNESCO. (2013). Information Literacy for Lifelong Learning: An Information Literacy Curriculum Framework for UNESCO. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000216317

Veinot, T. C. (2009). Interactive acquisition and sharing: Understanding the dynamics of HIV/AIDS information networks. *Journal of the American Society for Information Science and Technology*, *60*(11), 2313-2332.

Wathen, C. N., and Burkell, J. (2002). Believe it or not: Factors influencing credibility on the Web. *Journal of the American society for information science and technology*, *53*(2), 134-144.

Watson, D., Clark, L. A., and Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, *54*(6), 1063.

Wilson, T.D. Information behaviour: an interdisciplinary perspective. *Information Processing and Management, 33*(4), 1997, 551–572.

Wilson, T. D. (1999). Models in information behaviour research. *Journal of documentation*, *55*(3), 249-270.

Willson, R., & Given, L. M. (2020). "I'm in sheer survival mode": Information behaviour and affective experiences of early career academics. *Library & Information Science Research*, *42*(2), 101014.

Yang, Z. J., & Kahlor, L. (2013). What, me worry? The role of affect in information seeking and avoidance. *Science communication*, *35*(2), 189-212.

Zadra, J. R., and Clore, G. L. (2011). Emotion and perception: The role of affective information. *Wiley interdisciplinary reviews: cognitive science*, *2*(6), 676-685.

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American psychologist*, 35(2), 151.

Zajonc, R.B. (1984). On the primacy of affect. *American psychologist*, *39*(2), 117–123.

Zanganeh, M.Y. and Hariri, N. (2018). The role of emotional aspects in the information retrieval from the web. *Online Information Review, 42*(4), 520-534.

Zeelenberg, M., Nelissen, R. M., Breugelmans, S. M., and Pieters, R. (2008). On emotion specificity in decision making: Why feeling is for doing. *Judgment and Decision making*, *3*(1), 18.

Zeelenberg, R., Wagenmakers, E. J., and Rotteveel, M. (2006). The impact of emotion on perception: Bias or enhanced processing? *Psychological Science*, *17*(4), 287-291.

8 Appendices

8.1 Appendix 1: Final Interview Guide and Consent Form

Interview Process

1. **Direction:** Invite student in, introduce myself and any others (e.g. supervisor, if attending), sit student in comfortable chair. Offer tea and cookies and take time to get comfortable with small talk (exams, vacation).

2. **Direction:** Start the recorder and begin the preamble (let the participant know when it starts recording)

3. **Interview Question Guide**

- What do you think of when you hear the word "credibility"?
  - Does it change with the topic?
  - How about "credibility judgement?"

- What do you look for to help you judge the credibility of an online source?
  - Does it change with topic?

- When you are looking at information online, do you ever get a feeling about the source?
  - What kind of feeling – how would you describe it?
    - It is strong or weak?
    - What is it telling you?
  - When do you get the feeling?
    - Right away?
  - Does it change over time (while reading, next time you visit the site)?

- Does this feeling come into play in your judgement of credibility of the source? How? (RQ1)
    - When does it come into play?
    - Does it depend on the topic?
    - Does it depend on the source?

- Narrative 1: Can you describe a situation when you had a good or bad feeling about a source? (RQ2)
    - If you have trouble thinking of a situation, where was the last place you looked for information about your (Health, Leisure, News, Academic)?
    - What gave you the feeling? When did it happen?
    - What did you finally decide about the credibility of the source? What did you consider when you made that decision?
    - Did your good or bad feelings help you decide if the source was credible?
    - Is this a typical example of how you judge credibility, or out of the ordinary?
- Narrative 2: Can you describe a situation when you had a good (bad) feeling about the credibility of a source? (RQ2)

- Look at the survey question in front of you – do you use any of these criteria for judging credibility? Are they related? (RQ2a)
    - Which are more important to you? How does 'good or bad feeling' rate in these?

- Do your feelings come at the same time as the other criteria?
- Do your feelings relate to the other criteria or are they completely separate?
- Does the topic make a difference?
- Have you ever had to make a credibility judgement on just a feeling?

b) Do your feelings help or hinder your credibility judgements?

6. Direction: Answer any further questions of participant.

7. Direction: Turn off recorder, place in desk drawer.

8. Direction: Give consent form and explain its general contents. Ask student to sign and give payment of $25 in envelope.

9. Direction: Lock door to office, escort participant downstairs and let him/her out the front door.

10. Direction: Return to office, immediately download data from recorder onto laptop and create back-up on portable drive. Lock drive in cabinet. Erase recording from recorder.

11. Direction: Give signed consent form to supervisor to lock in his/her office.

Participant Consent Form

Researcher: *Anna Couch, PhD Candidate*, School of Information Studies, McGill University
anna.couch@mail.mcgill.ca

Supervisor: Dr. Catherine Guastavino

Title of Project: What does credibility feel like?: Investigating the role of emotion in credibility judgements of online information

Purpose of the Study: The purpose of this study is to understand *to what extent undergraduate students use their emotions when judging credibility of online sources of information. The study is related to a larger project that is looking at undergraduate metaliteracy skills and knowledge in their academic and everyday lives.*

Study Procedures: You are participating in a*n interview* to discuss *how emotion factors into your judgement of credibility about online sources related to your health, leisure, news and academic needs*. The *interview* will last *no more than 90* minutes. In order to accurately capture what you will tell us, we will audio-record the conversations.

Voluntary Participation: Participation in this study is voluntary. You may decline to answer any questions, and may withdraw from the study at any time, for any reason. If you withdraw during the *interview* session, your information and any data collected from you will not be used, unless you give permission otherwise. After the interviews are completed, all data is anonymized, and cannot be withdrawn.

Potential Risks: There are no anticipated risks to you by participating in this research.

Potential Benefits: Participating in this study might not benefit you directly, but we hope to better understand *how students judge the credibility of online information*. This will support both information services and systems to support the process of finding reliable information.

Compensation: You will receive $25.00 in compensation for your time.

Confidentiality: The only identifiable information collected is this consent form, and the audio-recording. This form is the only place where your name will be recorded. This form will be stored in a locked file cabinet in the office *of the Principal Investigator's supervisor, Dr. Catherine Guastavino* – it will be kept separately from all other information relating to this study.

Immediately following this interview, the audio file from the recording will be transferred to a *folder on a* password protected *laptop* –the *audio* file will be identified by code, not your name. Only the *i*nvestigator, *supervisors*, and the research assistants will have access to the file. The recording itself will not be disseminated in any way.

Finding from this research will be disseminated as presentations at scholarly/professional conferences and/or publications in scholarly/professional journals. In all dissemination, any findings from the research will be reported anonymously, and labelled with a non-identifying code (e.g., P1, P2, etc.).

Questions: If you have any questions or request clarification about this research, please contact the Principal Investigator: *Anna Couch - anna.couch@mail.mcgill.ca*

If you have any ethical concerns or complaints about your participation in this study and want to speak with someone not on the research team, please contact the McGill Ethics Manager at 514-398-6831 or lynda.mcneil@mcgill.ca.

Please sign below if you have read the above information and consent to participate in this study. Agreeing to participate in this study does not waive any of your rights or release the researchers from their responsibilities. A copy of this consent form will be given to you and the researcher will keep a copy.

Participant's Name (please print): _____

Participant's Signature: _____ Date: _____

8.2 Appendix 2: Codebook

Category	Name	Description/Examples
Affect as Information	AAI~ Emotion after judgement	Feeling described as result of credibility judgement
Affect as Information	AAI~ Emotion as helping	Answers to question about whether or not emotions help credibility judgements; Include some examples from throughout interview
Affect as Information	AAI~ Emotion as hindering	Answers to question about whether or not emotions hinder credibility judgements; Include some examples from throughout interview
Affect as Information	AAI~ Emotion before judgement	Feeling described as before judgement is made
Affect as Information	AAI~ Emotion leading to checking	Motivational aspects of emotion
Affect as Information	AAI~ Incidental Emotion	Emotions from situation leading to information need or other unrelated situation/mood
Affect as Information	AAI~ Integral Emotion	Emotions experience when interacting with information
Affect as Information	AAI~ Need to do something	Feeling an impulse to find information (even if it's not needed, likely to be credible)based on emotional reaction
Construct	Construct~ Credibility	Participants responses to question about credibility
Construct	Construct~ Credibility Judgement	Participants responses to question about credibility judgement
Construct	Credibility vs Agreeableness	When agreeableness becomes a construct for credibility, e.g. someone believes something because it appeals to their sense of enjoyment, or their personal likes/dislikes
Construct	Credibility vs Relevance	When participants describe finding credible information that isn't relevant
Construct	Feeling credibility	Emotion in relation to a judgement of credibility
Construct	Information vs Entertainment	Differentiating between information and entertainment while online
Contextual factors	SF~ Convenience	Situations where convenience is an important factor in how information will be checked - usually restricts checking
Contextual factors	SF~ Current political climate	Situations where politics influences how one feels about certain positions/perspectives; inspires need to find 'unbiased' information - can restrict (bias) or enable (trying to get balanced perspective)

Contextual factors	SF~ Importance	Situations where the outcome of getting credible information is high-stakes (e.g. Health, Academic)
Contextual factors	SF~ Information overload	Situations where there is too much information, overwhelming credibility checking (restricting)
Contextual factors	SF~ Lack of sources	Situation where there is not enough information to have a choice about credibility - enabling - more rigorous checking of what's available
Contextual factors	SF~ Urgency~Time Constraint	Situation where time is a factor e.g. assignment deadline (restricting)
Contextual factors	Topic~ Academic	Information topics and situations are academic (e.g. assignments, research)
Contextual factors	Topic~ Health	Information topics and situations are related to one's own or someone else's health or wellbeing (e.g. experiencing symptoms, looking for advice about a condition)
Contextual factors	Topic~ Leisure	Information topics and situations are leisure based (e.g. hobbies, travel, restaurants, shopping)
Contextual factors	Topic~ News	Information topics and situation are news-based (e.g. current events, politics)
Credibility Processing	Credibility Process ~ Change opinion~feeling~thought	Process where previously held thoughts/feelings about something/someone are changed by interaction with new information
Credibility Processing	Credibility Processing	Examples of participants descriptions of credibility processing
Credibility Processing	Credibility Processing ~ Believe~Use Info	Processes that end with positive credibility judgement
Credibility Processing	Credibility Processing ~ Check Credibility	Interactions that motivate checking of credibility
Credibility Processing	Credibility Processing ~ Disbelieve~Don't Use Info	Processes that end with negative credibility judgement
Credibility Processing	Credibility~ Less check	When participants report that they decided not to check credibility as much for example, because the topic is not serious, or they aren't interested
Credibility Processing	Credibility~ More checking	When participants report that they decided to check credibility more vigorously, for example because the topic is important, or they are very interested

Credibility Processing	Credibility~ No Check	When participants report that they decided not to check credibility at all, for example they didn't have time
Credibility Processing	Exposure to other ideas, norms, values	Usually in relation to encountering or searching in topics, sources one does not normally look into
Credibility Processing	Judgement after Checking	Credibility judgement was made after interacting with cues
Credibility Processing	Judgement before Checking	Credibility judgement was made immediately (before checking any cues)
Credibility Processing	Synthesis	Theme involving issues of bias, confirmation bias, and balance
Credibility Processing	Synthesis - Balance	Similar to objective, but with implication that participant can judge what is balanced
Criteria	Criterion~ Access	Easy or difficult access to information - credibility depends on ability to access the information
Criteria	Criterion~ Accuracy~Authenticity	Content-based; information is factual, has what the user needs; creator is sincere about his/her knowledge, skills, experience relating to information (particularly for leisure)
Criteria	Criterion~ Author Affiliation-reputation	Author/creator has a degree or works for a recognized, established company, enterprise, organization
Criteria	Criterion~ Author Expertise, Experience	Author/creator has experience with a topic, or expertise in the topic (sometimes overlaps with affiliation if expertise is demonstrated through credentials, particularly with academic information)
Criteria	Criterion~ Backed up-references	Information contains references, links that supports the information (sometimes overlaps with information matches other sources, but different as references may supports certain aspects of the source/information, or are related but not matching information)
Criteria	Criterion~ Clickbait~Sensationalism	Headlines/posts that are surprising or shocking created to 'get clicks'; content does not usually match headline or is inconsequential (sometimes overlaps with misinformation, but not always inaccurate)
Criteria	Criterion~ Common Sense~Logic	Information uses logic or appeals to common sense
Criteria	Criterion~ Comprehensiveness	Source has everything that participant is looking for, nothing is missing, no gaps in knowledge or facts

Criteria	Criterion~ Concise	Participants can find facts without having to do too much reading
Criteria	Criterion~ Design~Presentation	Design features, layout, professionalism, can refer to how old a website looks
Criteria	Criterion~ Ease of use	How easy it is to find the information that is needed, or use the interactive features (particularly with shopping)
Criteria	Criterion~ Enjoyment	Source appeals to one's sense of enjoyment, information/source conveys that one can/will enjoy the item, event, place (particularly with leisure)
Criteria	Criterion~ Informal~Down-to-Earth	author/creator conveys a sense of informality that is appropriate to the topic, isn't trying to impress (particularly for leisure information)
Criteria	Criterion~ Information matches other sources	Information matches the information found from other sources/platforms
Criteria	Criterion~ Information Up-to-Date	Information is current (particularly news information)
Criteria	Criterion~ Intention	There are no hidden agendas (usually with respect to selling something)
Criteria	Criterion~ Intuition~Gut feeling	Feeling that is not considered an emotion (explicitly) but used as a criteria for credibility, including: intuition, gut feeling, instinct, deep down, hunch.
Criteria	Criterion~ Misinformation~Fake news	Information that is not considered factual or is extremely biased (particularly with news); often reported in the context of people sharing it (either deliberately or not deliberately)
Criteria	Criterion~ My Good or Bad Feeling about source	Feelings that are reported as either discrete emotions (also coded alongside), or general emotions (good or bad feelings - also coded alongside) that are mentioned either as criteria for judging credibility themselves, or in relation to one of the other criteria (also coded alongside); Answers to question about importance and relationship to other criteria from survey
Criteria	Criterion~ My personal knowledge~experience	Participant uses their own knowledge or experience of topic to judge credibility
Criteria	Criterion~ My previous experience with website or source	Participants use previous interactions with source (successful or unsuccessful) as to judge credibility
Criteria	Criterion~ Objectivity~Bias	This code include both bias and objective (balanced) information as two sides of the same coin: bias shows non-credibility, balance or objectivity shows credibility.
Criteria	Criterion~ Obscurity~Strangeness	Information or sources that had strange names, affiliations or unheard of authors/creators. Also information that was considered itself to be strange or unlikely.
Criteria	Criterion~ Other Users' Reaction-Experience	Using other's posts about certain information, source, platform that included their opinions or experiences with it. Does not refer to their experience or expertise on the topic but the source/information itself (ratings, comments, up/downvotes, IRL opinions)

Criteria	Criterion~ Personality~Looks	Creator personality, presentation/speaking style, or looks
Criteria	Criterion~ Popularity~Wide Use	How many people have mentioned it (online or IRL) used it, rated it, commented on it, talked about it (overlaps with top hits on Google)
Criteria	Criterion~ Prof's judgement	Whether or not the prof would accept the source/information as credible for an assignment
Criteria	Criterion~ Quality of Images, Sounds, Videos	Whether the images, sounds, videos are good or bad quality; can refer to deliberate adjustment, editing of these to manipulate message
Criteria	Criterion~ Quality of Language	Quality of grammar, tone, presences of spelling errors/typos, style, genre
Criteria	Criterion~ Relevance	Credible information also has to be relevant to subject at hand (see Credibility vs Relevance)
Criteria	Criterion~ Same Interests~Tastes	Creator/author/user shares the same tastes or interests as the participant
Criteria	Criterion~ Source, website or platform reputation, affiliation	Hearsay about the source, not based on actual experience or reports from others, just general reputation as good or bad, right wing, left wing, trustworthy, not trustworthy
Criteria	Criterion~ Sponsored content	Presence of ads, pop-ups, indications of sponsorship, or content refers to commercial intent by creator, author
Criteria	Criterion~ Study Design	Mainly academic - study design/methodology (peer reviewed; clinical trials etc.)
Criteria	Criterion~ Top hit on Google	Whether a website is in the top hits or first 1-2 pages on Google
Criteria	Criterion~ Transparency	Whether the information, references, agenda, bias are made clear, obvious
Data Organization	Example	Narratives of what participants have actually done (not hypothetical or usual)
Data Organization	Question about Feeling	Refers to particular question about My good or bad feeling from survey
Data Organization	Survey Questions	Refers to section focusing on survey questions near end of interview
Demographic Info	Demo~ Age	Age of participant
Demographic Info	Demo~ Faculty~Program	Faculty of study (sometimes included program)
Demographic Info	Demo~ Female	Gender - female

Demographic Info	Demo~ International	Student status - international student
Demographic Info	Demo~ Male	Gender - male
Demographic Info	Demo~ Out-of-Province	Student status - Canadian nonresident
Demographic Info	Demo~ Participant ID	Participant ID
Demographic Info	Demo~ Quebec	Student status - resident
Emotion	Emotion- Annoyed-Irritated	Includes expressions that show irritation "rubs me the wrong way" - Differential: not angry or upset
Emotion	Emotion~ Accomplishment-Affirmation	Feeling that accompanies finding credible information after a long search, or finding something they felt they knew but confirmed it
Emotion	Emotion~ Amusement	Funny - usually in relation to news satire websites
Emotion	Emotion~ Angry-Bitter	Includes expressions that show anger "I really can't stand it" Differential - not irritated
Emotion	Emotion~ Appreciation~thankfulness	Also, gratitude (for helpful information)
Emotion	Emotion~ Bored-Disinterested	Can refer to situation - feeling bored then looking for information; or information - website or information is not interesting to read
Emotion	Emotion~ Calm	Hardly any stimulation, usually after stress or worry
Emotion	Emotion~ Comfort	Feeling safe, not worried, feeling that accompanies easy credibility checking
Emotion	Emotion~ Disappointment	Experienced sometimes when credibility was expected but then wasn't delivered
Emotion	Emotion~ Disgust	includes expressions like "it's garbage" or "turns my stomach"
Emotion	Emotion~ Embarrassed	Embarrassed
Emotion	Emotion~ Enjoyment	Differential - fun, not funny (amusing)
Emotion	Emotion~ Excitement	High arousal, differential - not interest
Emotion	Emotion~ Fear	Fear/afraid
Emotion	Emotion~ Feeling manipulated	Feeling like someone is trying to trick you or get something from you, or get you to do something
Emotion	Emotion~ Frustration	Frustration

Emotion	Emotion~ General bad	Used when emotion is negative, but no specific or discrete terms are used "I get a bad feeling from"
Emotion	Emotion~ General good	Used when emotion is positive, but no specific or discrete terms are used "I get a good feeling from"
Emotion	Emotion~ Happy	Happy
Emotion	Emotion~ Hopeful	Hopeful
Emotion	Emotion~ Hopeless-discouraged	Giving up
Emotion	Emotion~ Interest	Interested
Emotion	Emotion~ Laziness	Feeling related to not wanting to do anything (incidental - not having to do with topic)
Emotion	Emotion~ Like~Love	including preference
Emotion	Emotion~ Relief	Usually in relation to feeling after finding credible information, or trusted source
Emotion	Emotion~ Sad~Depressed	Sad/depressed - integral (particularly news) and Incidental (mental health)
Emotion	Emotion~ Satisfaction	related to finding credible information
Emotion	Emotion~ Skepticism	Differential - suspicious; skeptical in relation to things that are known but the credibility of which is doubted
Emotion	Emotion~ Stress-Desperation	In relation to situation of need, incidental (academic, health)
Emotion	Emotion~ Superiority	In relation to those who are gullible or in relation to information perceived as poor quality
Emotion	Emotion~ Surprise	Expressed as "wow" or "I couldn't believe it!"
Emotion	Emotion~ Suspicious	Differential - skeptical; suspicious in relation to thing that are not know but suspected to be non-credible, nebulous
Emotion	Emotion~ Uncertain-confused	Not being able to ascertain credibility or find useful cues about credibility
Emotion	Emotion~ Uncomfortable	Lack of safety
Emotion	Emotion~ Worry~Concern	Worry (health) incidental
Emotional Awareness	Confirmation bias	Favouring information or cues that support, reenforce one's currently held knowledge or beliefs/ignoring information, cues that may challenge one's own beliefs/knowledge
Emotional Awareness	Managing Emotions	Ability for participants to recognize and push through difficult emotions in order to continue to read/check source/information
Emotional Awareness Attributes	Attitude~ closed-minded	Participant describes approach that is against new ways of thinking, other POV

Emotional Awareness Attributes	Attitude~ Open-minded	Participant describes approach that is for new ways of thinking, other POV
Emotional Awareness Attributes	Awareness~self-reflection	Participant can talk about the role of their emotions in credibility judgements in a metacognitive way
IB and Outcomes	IB~ Bookmarks	Using bookmarks
IB and Outcomes	IB~ Branching	Following links from site to site
IB and Outcomes	IB~ Encountering	coming across information while scanning, surfing, or reading feeds
IB and Outcomes	IB~ Engaging in Social Media	Using any social media source
IB and Outcomes	IB~ First step	First information seeking action
IB and Outcomes	IB~ Posting~Commenting	Participant is posting their own information/commenting on something themselves
IB and Outcomes	IB~ Seeking	Looking for information based on a particular need
IB and Outcomes	IB~ Sharing	Sharing information with others using social media or IRL
IB and Outcomes	IB~ Superficial reading	Spending very little time on content
IB and Outcomes	Outcome~ Avoid Source	Never going to or clicking on a source, website, platform
IB and Outcomes	Outcome~ Continue~Find other source(s)	Keep looking at other sources, website
IB and Outcomes	Outcome~ New knowledge~learning	Found something credible and helped them to learn something new - transformative

IB and Outcomes	Outcome~ Share	Decision to share information (overlaps with IB-Sharing, but relates to decision)
IB and Outcomes	Outcome~ Source Preference	A new trusted source, or source that will be the go-to
IB and Outcomes	Outcome~ Stop searching	Stop searching before finding credible information, give up
IB and Outcomes	Outcome~ Unfriending~Don't Respond	Unfriending or not responding to a post on social media
IB and Outcomes	Positive vs Negative Comment~Review	Comparing negative and positive comments or reviews to make a decision about credibility relates to 'others' reactions/experience')
IB and Outcomes	Quantity vs Quality	Comparing quantity of ratings/reviews to quality of ratings/reviews (content) to make credibility decision
Source	Source~ Abstract~Description	Reference to exact source
Source	Source~ Alt Media	Reference to exact source
Source	Source~ Amazon	Reference to exact source
Source	Source~ Blog	Reference to exact source
Source	Source~ Book~Reference book	Reference to exact source
Source	Source~ Chegg	Reference to exact source
Source	Source~ Class Materials	Reference to exact source
Source	Source~ CNN	Reference to exact source
Source	Source~ Colleagues	Reference to exact source
Source	Source~ Comments	Reference to exact source
Source	Source~ Community-based	Reference to exact source
Source	Source~ Company website	Reference to exact source
Source	Source~ Doctor	Reference to exact source
Source	Source~ Engineering Tool Box	Reference to exact source
Source	Source~ FB	Reference to exact source
Source	Source~ Forum	Reference to exact source
Source	Source~ Fox News	Reference to exact source
Source	Source~ Friends~Family	Reference to exact source
Source	Source~ Google Reviews	Reference to exact source

Source	Source~ Google Scholar	Reference to exact source
Source	Source~ Google Search	Reference to exact source
Source	Source~ Government or university website	Reference to exact source
Source	Source~ Headlines~Titles	Reference to exact source
Source	Source~ Individual~Person	Reference to exact source
Source	Source~ Instagram	Reference to exact source
Source	Source~ International news source	Reference to exact source
Source	Source~ Journal	Reference to exact source
Source	Source~ Library~Library database	Reference to exact source
Source	Source~ LinkedIn	Reference to exact source
Source	Source~ Local news source	Reference to exact source
Source	Source~ Magazine	Reference to exact source
Source	Source~ Mainstream News Companies	Reference to exact source
Source	Source~ Movie Steaming Site	Reference to exact source
Source	Source~ News Aggregator	Reference to exact source
Source	Source~ News Satire	Reference to exact source
Source	Source~ NYT	Reference to exact source
Source	Source~ Paper mill	Reference to exact source
Source	Source~ PDF	Reference to exact source
Source	Source~ Philip DeFranco	Reference to exact source
Source	Source~ Podcast~Radio	Reference to exact source
Source	Source~ Primary Source	Reference to exact source
Source	Source~ Prof~TA	Reference to exact source
Source	Source~ ProQuest	Reference to exact source
Source	Source~ Public Health Websites	Reference to exact source
Source	Source~ PubMed	Reference to exact source
Source	Source~ Quora	Reference to exact source
Source	Source~ Reddit	Reference to exact source
Source	Source~ Reviews	Reference to exact source
Source	Source~ Rotten Tomatoes	Reference to exact source

Source	Source~ Self~Own knowledge	Reference to exact source
Source	Source~ Sheet music~tabs	Reference to exact source
Source	Source~ Snapchat	Reference to exact source
Source	Source~ Social Media	Reference to exact source
Source	Source~ Tao Bao	Reference to exact source
Source	Source~ Trust bank	Reference to exact source
Source	Source~ TV show	Reference to exact source
Source	Source~ Twitter	Reference to exact source
Source	Source~ UptoDate	Reference to exact source
Source	Source~ WebMD	Reference to exact source
Source	Source~ WeChat	Reference to exact source
Source	Source~ Wikipedia	Reference to exact source
Source	Source~ Yahoo! Answers	Reference to exact source
Source	Source~ Yelp	Reference to exact source
Source	Source~ YouTube~online videos	Reference to exact source
Trust	Building Trust	Process of encoding rationale, emotion, credibility construct based on a good or bad experience or otherwise learned/adopted
Trust	Losing trust	Process whereby previously trusted sources/information is challenged by new cues/information and trust is lost
Trust	Trust - text code	Based on text search of term 'trust' to identify where participants are using the term
Trust	Trust - Good design-presentation	Trust based on design feature, visual feature, personality, use of language, or other presentation-based criteria
Trust	Trust~ Institution-affiliation	Trust based on affiliation with well-known, established organization (e.g. university, fortune 500 company); includes people who work at these institutions (e.g. doctors, profs)
Trust	Trust~ Platform	Trust based on knowledge (or assumed knowledge) of how a platform works
Trust	Trust~ Previous Experience	Trust based on one's repeated good experience with a website, source, platform (overlaps with criterion: my previous experience)
Trust	Trust~ Relationship	Trust based on one's relationship with another person, including intimate knowledge of that person's thinking, knowledge, skills, experience
Trust	Trust~ Reputation-popularity	Trust based on hearsay about a source, wide use of that source, recommendation by a 3rd party (not related)
Trust	Trust~ Self Efficacy	Trust based on one's own abilities to judge credibility in certain areas of knowledge

8.3 Appendix 3: Mapping of emotions onto Scherer's dimensional model

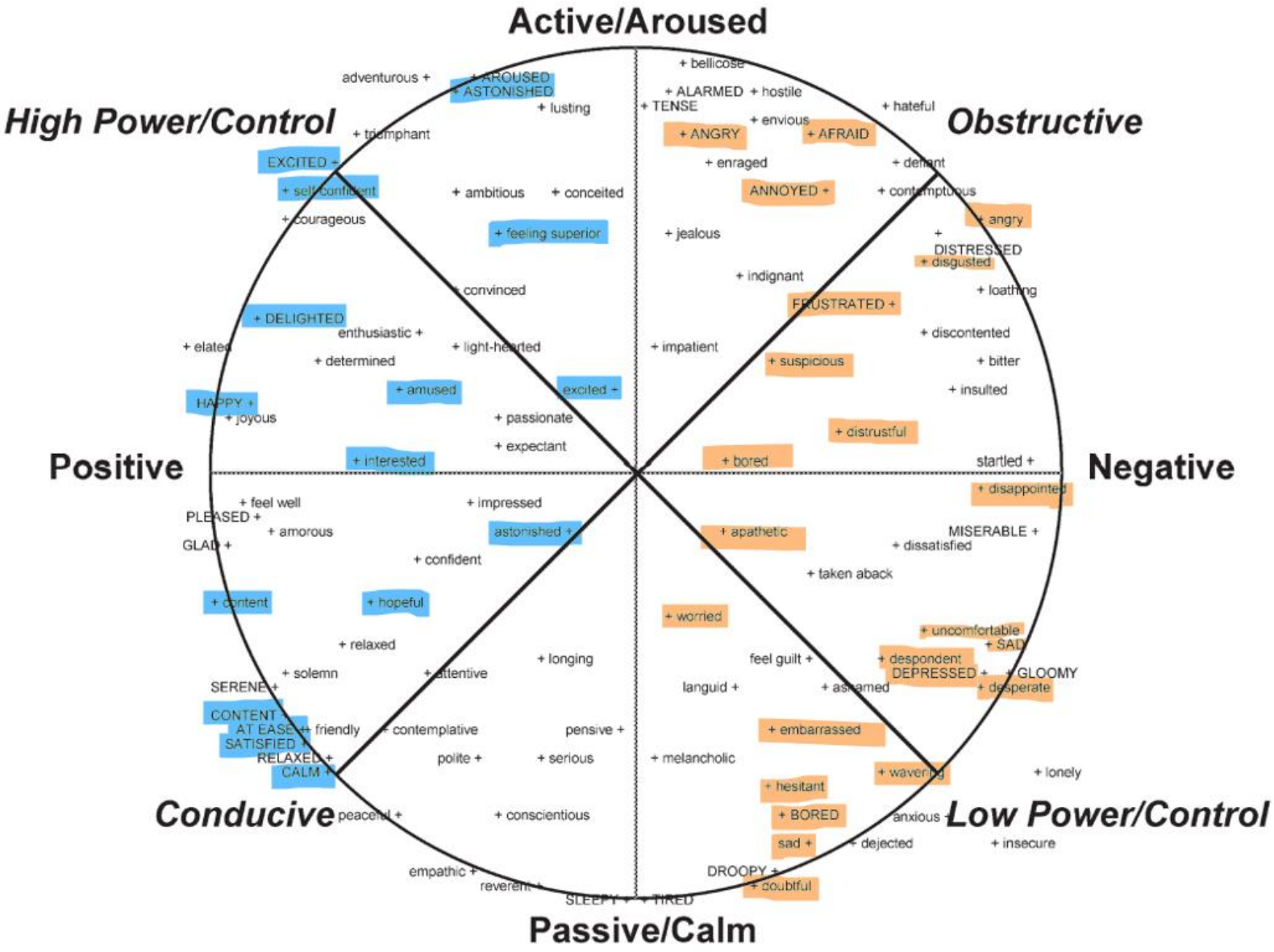


Table 1: Discrete emotions ranked by overall occurrence then number of participants who report it, Scherer categories in brackets. Feelings of general valence shown below (no ranking).

Rank	Emotion	Valence	Occurrences	Number of Participants
1	Interested	+	33	11
2	Excited	+	29	11
3	Skeptical/doubtful	-	24	11
4	Afraid	-	21	10
5	Suspicious	-	21	10
6	Stressed/Desperate	-	19	9
7	Annoyed/Irritated	-	19	8
8	Disappointed	-	17	12
9	Frustrated	-	16	6
10	Relief (at ease)	+	15	7
11	Sad/Depressed	-	14	6
12	Worried/Concerned	-	13	9
13	Comforted/Comfortable (content)	+	12	5
14	Uncertain/confused (hesitant/wavering)	-	11	7
15	Surprised (astonished)	+	10	8
16	Feeling Manipulated (distrustful)	-	10	7
17	Happy	+	10	7
18	Angry/Upset	-	10	6
19	Feeling Superior	+	10	4
20	Accomplished/Affirmed (self-confident)	+	9	7
21	Disgusted	-	8	5
22	Hopeful	+	6	5
23	Amused	+	6	4
24	Uncomfortable	-	6	4
25	Like/love	+	5	5
26	Appreciative	+	4	3
27	Bored	-	4	3
28	Enjoying (delighted)	+	4	3
29	Lazy (apathetic)	-	3	3
30	Satisfied	+	3	3
31	Hopeless/Discouraged (despondent)	-	3	3
32	Calm	+	3	2
33	Embarrassed	-	2	2
/	General Bad	-	37	13
/	General Good	+	27	15

8.4 Appendix 4: Criteria ranked by number of participants with code and occurrences in the data with Interaction Sub-Category

Rank	Criteria	Occurrences	Number of Participants Reporting	interaction sub-category
1	Other users' reactions/experiences	100	18	peripheral source cue
2	Objectivity/bias	97	17	content cue
3	My good or bad feeling	96	18	All subcategories
4	Information matches other sources	88	18	content cue
5	Quality of language	71	17	peripheral information object cue content cue
6	My personal knowledge/skills/experience	70	17	content cue
7	My previous experience with source, website, platform	68	18	peripheral source cue
8	Information is accurate/authentic	54	17	content cue
9	Expertise/experience of author/creator	54	17	peripheral source cue
10	Quality of images	53	15	peripheral information object cue content cue
11	Information is backed-up, referenced	46	16	content cue peripheral source cue
12	Design/presentation of website, source	42	12	peripheral information object cue
13	Information is Up-to-date	38	17	content cue
14	Shared interests/tastes with author, creator	38	15	content cue
15	Information is relevant	36	13	content cue
16	Affiliation/reputation of author, creator	32	16	peripheral source cue
17	Affiliation/reputation of source, website, platform	32	15	peripheral source cue
18	My intuition/gut feeling	31	11	content cue
19	Website, source is in top hits on Google	28	15	peripheral source cue
20	Information is comprehensive	26	13	content cue
21	Popularity/wide use	24	10	peripheral source cue
22	Transparency	23	13	content cue
23	Information is accessible	22	10	
24	Intention of author, creator, source	20	7	content cue peripheral source cue

25	Study Design	18	11	content cue
26	Website/content is easy to use, convenient	18	9	peripheral information object cue
27	Presence of obvious misinformation, fake news	18	9	content cue peripheral source cue
28	Information or references are obscure/strange	18	7	content cue peripheral source cue
29	Clickbait/sensationalism	16	11	peripheral information object cue
30	Information uses common sense/logic	16	10	content cue
31	Anticipating prof's judgement	12	9	peripheral source cue
32	Presence of sponsored content	12	8	peripheral source cue Peripheral information object cue
33	Personality/looks of author, creator	12	5	peripheral source cue
34	Informal/down-to-earth	11	6	peripheral source cue
35	Information is concise	7	6	content