How to draw out the best musical performance: Best practices for studio recording in the digital era

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August 2012

A thesis submitted to McGill University in partial fulfillment of the requirements for the degree of Ph. D. in Information Studies.

Dedication

This thesis is dedicated to my grandmother, Michèle Rémy.

Aknowledgements

First I would like to thank my supervisor Catherine Guastavino for inspiring me to undertake this PhD and for guiding me throughout the research process. I would also like to thank Caroline Cance and Maryse Lavoie for coauthoring and bringing their expertise to my thesis; Caroline Traube for her support and for inviting me to participate in her laboratory events at Université de Montréal; Alexis Baskind for reviewing and commenting on my entire manuscript; and James Clemens-Seely, Linda Cooper, Terri Hron, Abigail Kniffin, Mark Nelson, Michèle Rémy and Aaron Rosenblum for helping me with English.

I am very grateful to Theresa Leonard, Dave Douglas, and Barry Shiffman for allowing me to conduct my first experiment at The Banff Centre (Alberta, Canada), as well as to Agnieszka Roginska, Andy Milne, Paul Geluso and David Schroeder for hosting me in research residency and helping me coordinate my last experiment at the Department of Music and Performing Arts Professions of the Steinhardt School of Culture, Education and Human Development of New York University (NY, USA).

Of great importance were the members of the Multimodal Interdisciplinary Laboratory (MIL), specifically Tifanie Bouchara, Guillaume Boutard, François-Xavier Féron and Emma Murphy, for their comments on my manuscript and/or interesting discussions on my research. I would also like to mention the members of the Center for Interdisciplinary Research in Music Media and Technology (CIRMMT) for their technical support and for organizing workshops and conferences that greatly informed my research. Specifically, I would like to thank the director of CIRMMT, Marcelo Wanderley, for his support this last year.

I would like to thank my parents Brigitte and Jean-François Pras, as well as my friends Pedro Costa, Maude-Élvire Gravel, Charles-Etienne Marchand, Isabelle Neyret, Michel Salvail and Blandine Tourneux for their great support. I would also like to mention Carole Bessette, Catherine Daniel, David Flewelling and Ana Fuchs for keeping me healthy, as well as my trekking companions and the mountain guides Vicente Castro, Gombu, and Tendee Sherpa for giving me in the Himalayas the energy I needed to complete the writing of this dissertation.

Finally, I would like to warmly thank the record producers, sound engineers and musicians who accepted to share their talent and knowledge with me, and without whom this Ph.D. would not have been possible. I should not forget to acknowledge the Fonds Québecois de Recherche Société et Culture (FQRSC) and the Centre for Interdisciplinary in Music Media and Technology (CIRMMT) for financial support.

Abstract

This thesis aims to identify best practices for musical recording, involving the capture of multiple takes of a musical work in studio. Digital technologies and Internet file sharing have brought the recording industry to a transitional phase in which studio professions (sound engineer and record producer) need to be reinvented. To better understand the impact of technological advances on recording production, there is a critical need to investigate studio practices and studio professional's tacit knowledge, an area that has received scant attention in the academic research. This investigation lies at the intersection of knowledge management, and cultural and media studies. It is based on the theoretical concept of mediating roles in artistic creation and management.

This thesis on studio professionals' practices includes three parts: 1) musicians' expectations when collaborating with studio professions; 2) record producers' best practices; and 3) the impact of record producers' comments on perceived quality. Specifically, this dissertation reports five studies combining surveys addressed to young musicians and sound engineers, interviews of experienced record producers who have worked throughout the transition of the recording industry, and studio experiments bringing together musicians and studio professionals. A mixed-design approach was chosen with qualitative (content and discourse) analyses of verbal descriptions and statistical analyses of closed-ended questions.

Results show that musicians expect studio professionals to exhibit strong communication and interpersonal skills, and to take into consideration the aesthetics of their project. In response, record producers adapt their level of involvement from light coaching to deeper artistic collaboration according to the musicians' requests and personality. Furthermore, producers' comments between takes give a common ground to the ensemble and enhance musicians' focus throughout the recording session. Taken together, the findings highlighted the fact that recent changes in the music industry have not yet transformed the perceived roles and the recording approaches of sound engineers and record producers. However, studio professionals have adapted their organization to budget constraints and challenging conditions to produce high-quality recordings.

Record producers "extend" the ears of the musicians, guide them and provide feedback according to the aesthetic context of the project. Their mediating role between musicians and their audience is similar to the role of actor directors, and comparable with the role of managers in other production contexts. Theoretical investigations with field experiments provided a deep understanding of studio professionals' contribution to the quality of musical recording, hence this thesis contributes to a new methodology for artistic creation studies. On a practical ground, this study of the artistic aspect of recording production can help musicians make informed decisions when hiring studio professionals. On a theoretical ground, this dissertation extends the framework of mediating roles from management to the context of artistic creation.

Résumé

Cette thèse a pour but d'identifier les pratiques professionnelles de l'enregistrement musical qui implique la « capture » en studio de nombreuses prises d'une même œuvre. Les technologies numériques et les échanges de fichiers sur Internet ont déclenché une phase de transition de l'industrie de l'enregistrement dans laquelle les professions du studio (ingénieur du son et directeur artistique[1]) ont besoin d'être réinventées. Pour mieux comprendre l'impact des avancées technologiques sur la production d'enregistrements, il est important d'enquêter sur les pratiques et les connaissances tacites des professionnels du studio, un domaine qui a reçu peu d'attention dans la recherche académique. Cette investigation se situe à l'intersection de la gestion des connaissances, de l'étude des cultures et de l'étude des médias. Elle est basée sur le concept théorique des rôles de médiateur en création artistique et en gestion.

Cette thèse inclut trois parties : 1) les attentes des musiciens lorsqu'ils collaborent avec des professionnels du studio ; 2) les « meilleures pratiques » des directeurs artistiques ; et 3) l'impact des commentaires des directeurs artistiques sur la qualité perçue. En particulier, cinq études sont présentées alliant des enquêtes adressées à des jeunes musiciens et ingénieurs du son, des entretiens avec des directeurs artistiques expérimentés qui ont travaillé à travers la transition de l'industrie de l'enregistrement, et des études en studio réunissant des musiciens et des professionnels du studio. Une approche mixte a été choisie avec des analyses qualitatives (de contenu et de discours) des descriptions verbales et des analyses statistiques des questions fermées.

Les résultats montrent que les musiciens attendent des professionnels du studio d'afficher des aptitudes de communication et de prendre en considération l'esthétique de leur projet. En réponse, les directeurs artistiques adaptent leur niveau d'implication d'un accompagnement léger à une collaboration artistique profonde selon les demandes des musiciens et leur personnalité. De plus, les commentaires des directeurs artistiques donnent une base commune à l'ensemble et améliorent la concentration des musiciens pendant la séance d'enregistrement. Les résultats soulignent le fait que les changements récents de l'industrie

[1]Le terme anglais "record producer" peut être traduit de deux façons en français: "directeur artistique" (essentiellement pour les musiques classique et contemporaine) et "réalisateur" (essentiellement en pop-rock).

de l'enregistrement n'ont pas encore transformé la perception des rôles et les approches des ingénieurs du son et directeurs artistiques. Cependant, les professionnels de studio ont du adapter leur organisation aux contraintes budgétaires et aux conditions difficiles pour produire des enregistrements de qualité.

Les directeurs artistiques « prolongent » les oreilles des musiciens, guident et critiquent selon le contexte esthétique du projet. Leur rôle de médiateur entre les musiciens et leur public est similaire au rôle des directeurs d'acteurs, et comparable à celui des directeurs dans d'autres contextes de production. Les investigations théoriques avec les expériences en studio ont fourni une compréhension profonde de la contribution des professionnels de studio dans la qualité des enregistrements musicaux, donc cette thèse valide une nouvelle méthodologie pour les études en création artistique. D'un point de vue pratique, cette étude de l'aspect artistique de la production d'enregistrement peut aider les musiciens à prendre des décisions fondées lorsqu'ils embauchent des professionnels du studio. D'un point de vue théorique, cette thèse élargit le cadre du rôle de médiateur au contexte de la création artistique.

Contribution of Authors

The document is formatted as a manuscript dissertation and includes the following publications:

- Chapter 2: The first two sections of the literature review have been adapted from the first two sections of Pras, A., Lavoie, M., & Guastavino, C. The impact of technological advances on recording studio practices. *Journal of the American Society for Information Science and Technology*. Under revisions.

- Chapter 3: Adapted from Pras, A., & Guastavino, C. (2011). The role of music producers and sound engineers in the current recording context, as perceived by young professionals. *Musicae Scientiae*[2], *15*(1), 73.

- Chapter 4: Adapted from Pras, A. & Guastavino, C. (2009). Improving the sound quality of recordings through communication between musicians and sound engineers. In *Electronic proceedings of the International Computer Music Conference (ICMC)*[3], Montreal, QC, Canada.

- Chapter 5: Adapted from the third section of Pras, A., Lavoie, M., & Guastavino, C. The impact of technological advances on recording studio practices. *Journal of the American Society for Information Science and Technology*. Under revisions.

- Chapter 6: Adapted from Pras, A., Cance, C., & Guastavino, C. Record producers' best practices for artistic direction - From light coaching to deeper collaboration with musicians. *Science, Technology & Human Values*. Submitted. A preliminary version of the results was published in Pras, A. & Guastavino, C. (2011). Diriger l'écoute afin d'enregistrer la meilleure performance possible. In *Proceedings of Tracking the Creative Process in Music*[4], 2011, Lille, France.

[2] *Musicae Scientiae* (the Journal of the European Society for the Cognitive Sciences of Music) publishes empirical, theoretical and critical articles directed at increasing understanding of how music is perceived, represented and generated.

[3] ICMC is a major international forum for the presentation of the full range of outcomes from technical and musical research, both musical and theoretical, related to the use of computers in music.

[4] The international conference TCPM 2011 assembled for the first time a considerable number of researchers interested in the study of the creative processes involved in the production of music/sound, to take the first steps towards a comparative assessment of the different methodologies developed over the

- Chapter 7: Adapted from Pras, A. & Guastavino, C. Impact of producers' comments and musicians' self-evaluation on perceived recording quality. *Journal of Music Technology and Education*. Submitted. A preliminary version of the results was published and received the Student Paper Award in Pras, A. & Guastavino, C. (2011). The Impact of Producers' Comments and Musicians' Self-Evaluation on Performance During Recording Sessions. In *Proceedings of the 131st Convention of the Audio Engineering Society (AES)*, New York, NY, USA.

I was responsible for carrying out all theoretical investigations and field experiments, including the design of the questionnaires, the data collection, the data analysis, and preparing the manuscripts for all of the above listed publications. My research supervisor Prof. Catherine Guastavino contributed guidance in the conception of the studies, and the analysis and interpretation of the results. Maryse Lavoie, Ph.D. candidate in musicology at Université de Montréal, contributed reviewing the analysis of data for Chapter 5 and helped prepare the manuscript. Caroline Cance, assistant professor in linguistics at Université d'Orléans, validated the content analysis of data for Chapter 6 and her expertise in discourse analysis allowed us to strengthen the content analysis of world-renowned producers' interviews.

last thirty years in research areas which interact with each other all too rarely. The conference served to open up broader issues of artistic creativity as it is approached in fields outside of musicology: history, psychology, cognitive science, sociology, anthropology, genetic criticism, etc.

Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Context of the research project

1.1.1 Music aesthetics and recording

In every culture and society, many musical genres cohabit but function differently. Musical genres categorize music aesthetics, a concept that refers to typical compositional languages and/or sound textures. In musicology, music aesthetics are defined around compositions, their writing techniques, form and style, their interpretation and their impact on listeners (Accaoui, 2011). Accomplishing all the features that define a typical aesthetic with authenticity ensures the success of an artist, e.g. the list of features to interpret accurately religious singing from the Sardinian community of Castelsardo (Nattiez, 2002). Clarke (2005) broadened the definition of music aesthetics and argued that the perception of authenticity and creativity in music depends on cultural traditions. In *Other worlds: Towards an ontology of improvisation,* Lewis (forthcoming) further described music aesthetics as derived from the socio-cultural context of a musical performance. According to him, the knowledge of this socio-cultural context is required to understand the music and to be emotionally reached by

it. He illustrated his statement with the recording of *Blasé* by Jeanne Lee and Archie Shepp in Paris (BYG Records France, 1969), where the improvisation among musicians highlights the lyrics of Jeanne Lee denouncing bad treatment to women in the African-American community. In a similar vein, Sansom (2007) showed music aesthetics' connection to society by demonstrating that musical interactions while improvising reflect personal interactions on a large scale. In this dissertation, the diversity of music aesthetics will be taken into consideration to study studio practices in the context of musical recordings.

The possibility of reproducing works of art through pictures and sound jeopardized the concept of art aesthetics and brought to an end "the doctrine of l'art pour l'art" [art for art's sake] (Benjamin, 1936). According to Benjamin, at the age of reproduction, "the criterion of authenticity ceases to be applicable to artistic production", as performances can be played back many times, as well as sliced and edited using technology. Sound recording have made in-depth study of musical performance possible, which has led to major transformations in composition, interpretation, and generated new musical genres, e.g. jazz (Chanan, 1995). Researchers in systematic studies of performance (Clarke, 2004) and ethnomusicology use recordings to analyze music aesthetics but they do not yet address the process of technical reproduction itself. This despite the fact that Benjamin (1936) argued that musical recording "had captured a place of its own among artistic processes" and that Clark himself (2005) extended the concept of recording beyond a "reified reference", as illustrated in popular music where recording technologies play a major role in the creative process (e.g. use of sound effects). Therefore, on the one hand the diversity of music aesthetics calls for an adaptation of recording sessions to the social-cultural context of the music. On the other hand, studio practices bring a new layer in music creation that plays a role in the definition of music aesthetics.

1.1.2 Challenges of studio recording

Since the beginning of music broadcasting, recording in studio has presented difficulties for musicians. The main challenge is to play convincing music without the presence of an audience. Moreover, "recording technology cannot be transparent" (Patmore & Clarke, 2007), it always transforms the performance that musicians hear in the studio. Furthermore,

with the possibility of editing takes and mixing tracks in post-production, recording sessions became more and more sophisticated over the years, but also more demanding for musicians who need to perform for long hours and to repeat isolated sections of the music (Chanan, 1995). Therefore, studio professionals have to find ways to minimize these studio challenges and to optimize the recording situations in order to draw out the best musical performance.

1.1.3 Transformations of the recording industry since the 1980s

Although the recording industry has been in constant reconstruction since the invention of sound reproduction, it encountered major upheavals in the last twenty years. The introduction of digital technologies in the 1980s made recording production possible with virtual instruments and computer-based tools. It progressively led to the delocalization of well-equipped studios in favor of home-studios lacking room acoustics, highly-specialized equipment and competent professionals (Théberge, 2004). But it also allowed musicians to produce their recordings independently from major record companies.

Since the end of the 1990s, the possibility of sharing music files through the Internet has encouraged independent labels and *DIY* [Do It Yourself] productions (Strachan, 2007). Most music files are now shared through social networks and streaming websites, mixing up beginners with famous musicians (Antin & Earp, 2010). Between 2004 and 2011, revenues from online distribution in music companies have increased by 1000 %, but overall musical sales have decreased by 31 % (IFPI, 2010). Consequently, traditional record companies no longer invest in album production and promotion (David, 2010). Instead of developing artists' careers with a new audience, they base their artists' selection on their commercial autonomy (Jouvenet, 2007). To summarize, Internet file sharing jeopardized the traditional business model of record companies and resulted in an explosion of music available online.

1.1.4 Consequences on recording quality

According to McLoad (2005), this new organization of the recording industry generates more artistic freedom and creativity than the traditional business model of record com-

panies. However, both budget constraints for production and the demise of well-equipped studios limit the possibility of creating successful recordings. Indeed, albums like the ones that stood up for generations everywhere in the world are not produced any longer, e.g. *Kind of Blue* by Miles Davis (Columbia Records, 1959, best selling jazz record released, over 4 million sales[1]), *Abbey Road* by The Beatles (Apple Records, 1969, over 19 million sales), and *Thriller* by Michael Jackson (Epic Records, 1982, best selling album of all times, over 110 million sales). Although the production budget of *Kind of Blue*[2] is not comparable to *Thriller*[3], it should be noted that these three albums were recorded in outstanding studios and with the presence of a record producer, a sound engineer and several studio assistants.

1.1.5 Consequences on studio professions

In the new paradigm of the recording industry, record producers and sound engineers experience a transitional phase and need to be reinvented (Burgess, 2008). Musicians hire studio professionals who cannot count on sale royalties anymore so they ask to be paid ahead of time. This client relationship with musicians may damage the artistic collaboration in the production process. Indeed the sound mixer Chris Lord Alge (credited on *Living In America* by James Brown amongst many other tracks) advised against money negotiations between musicians and studio professionals. He argued that budget discussions in the studio prevent from artistic focus and recommended that a manager would handle negotiations[4].

Due to limited production budgets, studio professionals often handle three jobs at once, namely record producer, sound engineer and studio assistant (Neuenfeldt, 2007), which is likely to have a negative impact on the quality of recordings. Furthermore, they have to adapt to different recording situations, either studios or musical genres, as they do not benefit from record companies' facilities anymore, and most of them cannot afford to specialize in only one genre.

[1] All sales numbers were retrieved from http://en.wikipedia.org

[2] "initial production costs of a few thousand of dollars in 1959 (contractual advance to Miles union scale payment to six sidemen, nine hours studio time [two days], four reels of tape, one piano tune)" (Kahn, 2001)

[3] production budget of $750 000, eight months of recording sessions (retrieved from http://en.wikipedia.org)

[4] Master class at SSL event at Avatar on Feb 19, 2012. Confirmed by email in March 2012.

In the past, studio professionals' knowledge was transferred on the job through an apprenticeship model (Pinch & Bijsterveld, 2004). With the delocalization of well-equipped studios to home studios, the job of studio assistants tends to disappear, thus studio practices cannot be learned by observing experienced professionals any longer. Therefore, required knowledge to become a sound engineer and/or a record producer is transferred in formal programs of educational institutions (Porcello, 2004).

1.2 Research objectives

This thesis aims to investigate studio professionals' best practices for the production of musical recordings throughout the technological and economic evolution of the recording industry. This investigation focuses on the context of recording sessions as the main part of the creative process of musical recordings, i.e. capturing different takes of a musical project in studio. It includes the pre-production phase needed to gather information about the music to be recorded. Nevertheless it does not analyze post-production processes, i.e. editing, mixing, mastering. Without restriction to specific musical genres, geographical or social contexts, this investigation takes into consideration different aesthetics of recording.

1.3 Research questions

The main goal of this thesis is to identify best practices of studio professionals in the context of musical recording, in light of the technological changes and resulting challenges that they are facing. This investigation includes five research questions:

- Q1. What are the expectations of musicians when collaborating with a sound engineer and/or a music producer for their recording project?
- Q2. How can pre-production meetings improve recording sound quality?
- Q3. How do recent technological advances impact recording practices?

- Q4. What are the best practices of world-renowned record producers for the artistic direction of musical recordings?
- Q5. What is the effect of record producer's feedback on performance in the studio, as opposed to musicians relying exclusively on self-evaluation?

Links amongst these research questions and the methodological approach are detailed in the next two sections.

1.4 Methodological approach

1.4.1 Mixed-methods to collect data

To examine practices in media studies, Larsen (2008) discussed the benefit of undertaking several observations involving professionals with different expertise from the study context. Donin & Theureau (2007) demonstrated the effectiveness of qualitative methods to investigate collaborative and creative cognition. To study the case of musical composition through the experience of the French composer Philippe Leroux[5], they collected data from several interviews, in which they recreated "the compositional situation through the use of materials" provided by the composer, i.e. manuscript scores, electronic sound files, screenshots of various stages of the computer work, and e-mail exchanges with performers. Inspired by Donin and Teureau's research and Larsen's discussion, we investigated studio practices by triangulation using surveys, focus groups, individual interviews, and field experiments. Our investigation relied primarily on the analysis of free-format verbal description of practitioners with different expertise (musicians, sound engineers, record producers), given the lack of written documents in the context of musical recording. Indeed, the only written sources of documentation from recording sessions consist of time sheets, lists of contacts, lists of equipment and lists of recorded takes; as such they do not inform our research question. To further investigate the interaction between musicians and record producers, we recreated

[5]Analyse des Pratiques Musicales, Institut de Recherche et Coordination Acoustique/Musique (IRCAM), Paris, France

real life situations in the field experiments in recording studios. Finally, we compared the various outcomes from this combination of methods to address the five research questions.

1.4.2 Mixed-methods to analyze qualitative data

Surveys, interviews and focus groups consisted exclusively of semi-directed questions to gather verbal descriptions from professionals with different expertise, i.e. record producers, sound engineers, and musicians. We used the constant comparison technique of Grounded Theory to analyze free-format verbal descriptions (Corbin & Strauss, 2008; Glaser & Strauss, 1967). This technique allowed us 1) to extract the emergent concepts from the content analysis of the free-format data, 2) to make potential consensus explicit among respondents or interviewees, 3) to classify the identified concepts into sub-categories and categories, and 4) to establish relationship between concepts within a study and between studies.

Because of the exploratory nature of these studies on the topic, we did not use predetermined categories to analyze the free-format answers. In the first surveys, we combined general questions addressing the perceived role of ideal producers and engineers with more specific questions addressing positive and negative experiences when collaborating with studio professionals. This approach builds upon previous questionnaire studies that have demonstrated the effectiveness of contrasting abstract memory representation ("the ideal producer") and contextualized experiences by referring to specific situations to facilitate respondents' recollection (Guastavino, 2006; Dubois, 2009). In order to highlight important outcomes of the surveys, we quantified occurrences for each identified concept. We took into consideration these identified concepts to guide the content analysis of the interviews.

In order to further investigate the interviews, we applied a linguistic discourse analysis (in terms of linguistic markers and the use of personal pronouns) that allowed us to contrast discourses referring to individual experience with discourses referring to consensual shared knowledge (Dubois, 2008). This use of discourse analysis to strengthen the outcome of the content analysis approach has been the basis for earlier investigations, i.e. discourses on musical sounds (Bensa et al., 2005; Morange et al., 2010), everyday sounds (Guastavino,

2006; Guastavino et al., 2005; Guastavino, 2007), visual spaces (Cance et al., 2009), or more holistic concepts such as comfort (Delepaut, 2007; Dorey & Guastavino, 2011) or expertise (Langlois et al., 2011).

1.4.3 Experimental context and quality evaluation of the field experiments

The two field experiments involved recording sessions in well-equipped studios with professional record producers and sound engineers, thus ensuring the ecological validity of these experiments (Dubois, 2009). As an incentive to participate, musicians received a copy[6] of the recordings that they could use to promote their music, thus imitating a real-life situation and ensuring their motivation in producing a good result. We collected feedback from participants at different stages of the experiments (pre-production meetings, recording sessions, listening sessions a few weeks after the recording sessions) with questionnaires combining multiple-choice questions and open-ended questions. Therefore, we applied a combination of statistical analysis of closed-ended questions (descriptive statistics, Chi-square tests, ANOVA) and content analysis of open-ended questions (identification of music and sound criteria used by participants to describe their music, their request, and the results). In both experiments, in order to test the experimental conditions, musicians who participated in the sessions were asked to evaluate the quality of the recordings (sound quality and/or performance quality). In order to complement musicians' evaluations, we also asked sound engineers to fill out the surveys for the first field experiment and we conducted listening sessions with an external musician for the second experiment.

1.4.4 Methodological considerations

For each study, participants were recruited from specific populations of practitioners following criteria that met the purposes of the research questions. For the first survey and field experiment, the international and talented population of young musicians and sound engineers from the International Jazz Workshop (IJW) of The Banff Centre was chosen to

[6] Edited, mixed and mastered version of the recording.

address the expectations and perspectives of young but already experienced professionals working in the studio in the current recording context. For the record producers' interviews, only professionals with more than 20 years of studio experience and still active were contacted to document their perspectives on the recent technological and economic changes of the recording industry. Furthermore, they were selected, using purposive sampling, for their outstanding portfolios including collaborations with famous artists and many awards in the music business (e.g. Grammy Awards), to investigate "best practices" for artistic direction of recording sessions. For the second field experiment, the population of music students and faculty from the Steinhardt School of New York University was chosen for its high artistic level and for the access to the appropriate research facilities of the department.

Twenty-two participants of the IJW of The Banff Centre responded to our survey, which allowed us to collect enough data to identify consensus in the description of studio professionals' roles. We interviewed only six record producers because our criteria implied a population very hard to reach. However, this small number of interviewees allowed us to conduct and fully transcribed long interviews and to analyze the verbal descriptions in depth. During the first field experiment, seven recording sessions were conducted involving 34 musicians and four sound engineers. During the second field experiment, five recording sessions were conducted involving 25 musicians and four record producers. The number of sessions for both experiments depended on studio booking constraints that were optimized by conducting most of these sessions at night and during weekends. The number of participants for both experiments allowed enough data to draw conclusions.

All questionnaires were designed in collaboration with Prof. Guastavino and were reviewed by at least one practitioner (musicians and/or studio professional). Furthermore, the first survey was pre-tested and commented on by one musician, and questions were adapted accordingly. Similarly, the interview guide was pre-tested by a record producer who proposed additional questions and sub-questions.

1.5 Dissertation structure

In three parts following the literature review, this dissertation addresses the five research questions with the help of theoretical investigations and field experiments (see Table 1.1). We first address musicians' perspectives and expectations in keeping with the current client relationship between musicians and studio professionals without record companies as intermediary during the production process. Then, we investigate the perspectives and practices of record producers who have worked throughout the transition of the recording industry. Finally, we evaluate the impact of record producers on musical recordings in a field experiment bringing together musicians and record producers.

Part	**Chapter - study**	**Corresponding research question**
I - Musicians' expectations when collaborating with studio professionals	3 - IJW of the Banff Centre. Online questionnaire	Q1*
	4 - IJW of the Banff Centre. Field experiment	Q2
II - Record producers' best practices	5 - Interviews of world renowned record producers Part 1	Q3
	6 - Interviews of world renowned record producers Part 2	Q4
III - Impact of record producers' comments on perceived quality	7 - Field experiment at the Steinhardt School of New York University	Q5

Table 1.1 Dissertation structure.

*It should be noted that the outcomes of Chapter 3 were used to design the interview guide for Chapters 5 and 6, and thus to answer Q3 and Q4.

1.5.1 Part I - Musicians' expectations when collaborating with studio professionals

The first part combines a questionnaire study and a field experiment both conducted at The Banff Centre with an international community of young and talented musicians and sound engineers. This community offers an ideal population to investigate the context of musical recordings in the present days without geographical restrictions. In the questionnaire study (Chapter 3), these young professionals freely define the role of sound engineers and music producers. The described roles are then compared with the traditional ones as found in the literature. The field experiment (Chapter 4) aims to evaluate a method of pre-production based on musicians' expectations in term of sound quality and session flow. Together, these two studies address the first two research questions and their outcomes provide a useful point of comparison to answer the other three research questions.

1.5.2 Part II - Record producers' best practices

The second part identifies record producers' best practices for conducting studio sessions. It is based on interviews of producers with outstanding portfolios, still active and with at least twenty years of studio experience, from Europe and North America and specialized in different musical genres. The analysis of these interviews is divided into two parts: 1) (Chapter 5) the impact of technological and economic advances on record producers' recording approach and career path (addressing the third research question); 2) (Chapter 6) record producers' knowledge, skills and competences required to draw out the best musical performance in the studio (addressing the fourth research question). The outcomes of this two-part analysis were compared with musicians' perspectives and expectations.

1.5.3 Part III - Impact of record producers' comments on perceived quality

The third part is based on a studio experiment conducted in the music technology and jazz programs of the Steinhardt School of New York University (Chapter 7). Students and

faculty from both programs participated in recording sessions. For each session, two types of feedback between takes were varied independently: with or without comments from a record producer and with or without musicians' self-evaluation after listening to the takes in the control room. Data were collected from questionnaire feedback combining multiple-choice questions and open questions. This studio study addresses the fifth research question and complements findings from the previous studies.

Chapter 2

Literature review

Sections 2.2 and 2.3 of the following chapter has been adapted from the first two sections of:

Pras, A., Lavoie, M., & Guastavino, C. The impact of technological advances on recording studio practices. *Journal of the American Society for Information Science and Technology*. Under revisions.

2.1 Introduction

The purpose of this literature review is to establish connections between the evolution of recording practices and technological advances (Section 2.2), and between the economic development of the recording industry and the production organization (Section 2.3). In order to establish these connections, the literature from diverse research areas was synthesized, specifically cultural studies, media and communications studies, sociology of art, aesthetics, systematic musicology, information studies, law and management. In the last section of

this chapter (Section 2.4) is presented the interdisciplinary framework of this thesis with a literature review on music in information studies, the concept of tacit knowledge, and the definition of mediating roles in management.

2.2 The culture and history of musical recording: how technological improvements led to a complex art form

2.2.1 The invention of sound reproduction

The history of sound recording began in 1876 when Graham Bell and Thomas Watson first invented a process to capture sounds, and then two years later a wax cylinder device capable of storing those captured sounds. In 1877, the French poet and inventor Charles Cros described an apparatus for sound recording and reproduction - the paleophone, introduced one year later in the United States by Thomas Alva Edison as the phonograph. Since then, sound reproduction techniques (recording and broadcasting) have attempted to immortalize speeches, musical performances, or any other sound.

Chanan (1995) and Sterne (2006) described the transformations created by the possibility of reproducing sound as comparable to some extent to the invention of photography 50 years earlier. People adapted their look and gestures after watching themselves on a picture (Barthes, 1981); similarly, the possibility of hearing back their voice had a direct impact on the way they speak. The objectivity of the microphone allowed musicians and singers to step back from their performance and then to adapt their interpretation. Reciprocally, performers invented new modes of expression by experimenting with different ways of using the microphone "as an instrument in its own right, not just a passive means of capturing sound" (Chanan, 1995). Glenn Gould "asserted that the recording medium has changed the manner in which some performers interpret music" (Théberge, 1986). Sterne (2006) generalized this cultural phenomenon to include the interaction between media and human practices: "If media [...] extend our senses, they do so as crystallized versions and elaborations of people's prior practices – or techniques – of using their sense".

Furthermore, the experience of recorded music as a fixed artwork differs from the experience of live performance. From the point of view of the audience, the "distance, both physical and psychic, between performer and audience [...] produces new ways for music to be heard and allows the listener totally new ways of using it" (Chanan, 1995). Recorded music can be heard in private, sometimes in the presence of distractions, with the possibility of changing its volume or switching it off anytime (Edidin, 1999). In other words, "recording [...] takes music out of the time dimension and puts it in the space dimension" (Eno quoted in Cox & Warner, 2004). Brian Eno argued that this effect of recording has inspired composers to write music that would be too complicated or too subtle for single listening.

Music broadcasting to geographically widespread areas generated further profound transformations in music composition and performance, e.g. going from romanticism to modernism (with composers such as Debussy, Schoenberg, and Bartok); and the beginning of jazz (Chanan, 1995). Studio practices have also had an impact on composers' language and methods and created new musical genres: "A tune is nothing before being *arranged*, and, far more than being literally at the compositional level, it is at the orchestration, recording and mixing stages that it is created" (our translation, Hennion, 1981). According to Hennion, 2003, "jazz has been written by recordings." In the same way that scores constitute a physical trace that composers can study, musical recordings play a crucial role in the education of performers: "musicians first developed their instrumental technique by copying records. But the role of the record was not a substitute for writing scores, [...]; it communicated what cannot be indicated in any score, the nuances of articulation and timbre which are among the central stylistic concerns of jazz" (Chanan, 1995). While music notation made music compositions permanent, music reproduction fixes musical performances in time. Therefore, recordings allow artists and researchers to study musical interpretation in depth, and Chanan (1995) claimed, "qualities of performance are generally more important than what is performed". The area of systematic studies of performance started growing when recording technologies were good enough to capture detailed actions of musical instruments (Clarke, 2004).

Over the years, record players became musical instruments, using recorded performances as material for composition: composers like John Cage wrote pieces where performers had

to play radios and phonographs on stage, and composers like Pierre Schaeffer distorted existing recordings to create new pieces (Oswald quoted in Cox & Warner, 2004). Later on, Disc Jockeys started using recordings and developed techniques such as vinyl scratching for live performance.

To summarize, musical recordings strongly influenced performers and composers in their musical creations. On the other hand, recordings provide listeners with new ways to enjoy music. Although many music lovers report feeling stronger emotions in live concerts than when listening to recordings, "Today far more people listen to recorded music than live musicians; hence the sound of the recording is what is important, and contributes heavily to making or breaking an act" (Moorefield, 2005).

2.2.2 Aesthetic approaches to musical recording

"At first, recordings had to be made practically by hand" (Moorefield, 2005). In early mechanical recordings, technical constraints motivated sound engineers to develop creative methods in the placing of microphones very close to the acoustic sources so as to capture sounds that would facilitate the readability of musical discourse (Seymour, 1918). Many authors agree that the scope of early recordings aimed at perfect fidelity, but Milner (2009) reported that Edison already "believed that a perfect recording could provide music that was truer, purer, realer than the music event it documented. It could provide a direct link to the music's essence, collapsing the real and metaphorical distance between the singer onstage and the listener in the audience," which suggests that different approaches to musical recording theoretically existed since the invention of sound reproduction, at least in imagination. Over the years, technological improvements have made Edison's wish come true and "recording's metaphor has shifted from the *illusion of reality* (mimetic space) to the *reality of illusion* (a virtual world in which everything is possible)" (Moorefield, 2005).

Electrical recordings techniques that enabled the amplification of microphone signals, together with playback on loudspeakers, were introduced by the end of the First World War. Both amplification and better recording quality motivated consumers to buy devices to listen to music at home. The spread of electrical recordings in the 1920s motivated

the record industry to produce higher-quality recordings that garnered increased attention for a wider range of listeners. In particular, electrical recording techniques allowed for the placement of microphones further away from the sources, capturing the natural room reverberation (Biddle et al., 2002) and therefore creating "a metaphor of presence" (Moorefield, 2005), the listeners' illusion that they are sitting in the Philharmonic Hall rather than in their living room. Leopold Stokowski, with a fascinating career as both engineer at Bell Laboratories and director of the Philadelphia orchestra, was a pioneer in the use of electrical recordings. According to Glenn Gould, Leopold Stokowski "exemplified, through his major career decisions, the practical and philosophical consequences of technology" (Théberge, 1986).

Long Playing discs (L.P.) were introduced in 1931 by Columbia Records, allowing the recording of longer pieces of music (from three minutes for 78 r.p.m.s[1] to 23 minutes for 33r.p.m.s -L.P.s). In addition to this new flexibility in terms of duration, improvements in microphone technology followed by the invention of stereophony (1940s) led record engineers to develop new techniques. They aimed at creating an interesting stereo image, a kind of illusion comparable to cinema, rather than focusing on fidelity Chanan (1995); Patmore & Clarke (2007). In addition, "it became possible to use multiple microphones and mix them together during recording, thus compensating [...] for imbalances" Kealy (1979). Since then, sound engineers' challenges consist in matching their techniques with the chosen musical aesthetic (Chanan, 1995; Hennion, 1981; Patmore & Clarke, 2007). Hence, capturing sound became a considered act requiring artistic decisions, namely in a recording location and situation (with an extension to live performances), in the choice of microphones and their placement, in the balance of the various microphones' intensity levels, all of which determine spatial sonority and perception (Hennion, 1981).

Patmore & Clarke (2007)detailed two main aesthetics of musical recording, through the work experience of John Culshaw, a sound engineer and producer at Decca (a well-known label for German opera productions). The first approach could be summarized as capturing performances, where the concert performance is taken as the reference; the second approach corresponds to the creation of virtual acoustic worlds, different from the live performance in a concert hall, where the composition itself is the reference. In the view of this second

[1]Revolutions per minute.

approach, Glenn Gould "rejected any attempt to recreate the concert hall sound in favor of a close, analytical perspective on the sound of the instrument itself" (Théberge, 1986). While Patmore and Clark described them only in terms of classical music, Chanan (1995) and Théberge (2004) extended the definition of these two different aesthetics to popular musical genres and mentioned that they were generated by two different production contexts: the recording studio on the one hand (balance between direct sound and hall acoustics to capture performance) and the radio broadcast on the other (close miking, instruments acoustically separated and not recorded at the same time, and use of effects to create a new dimension of sound).

In the Art of Recording, Hamilton (2003) emphasized, "The recorded image, like the photographic image, is always crafted. It is not unmediated, the medium is significant." Indeed, recording cannot be a transparent process (Chanan, 1995; Patmore & Clarke, 2007). However, recording engineers and artists have the choice between *Attempting realism* and *Creating virtual worlds*.

2.2.3 Like films, musical recordings became a puzzle of edited takes and mixed tracks

By the end of the Second World War, magnetic tape recordings emerged and transformed recording studios into musical instruments (Moorefield, 2005). Tape manipulation generated three important techniques to produce musical recordings: music editing by cutting and pasting the tape; replacing short musical passages by recording onto (and overwriting) previously recorded tracks (a technique called *punch in*); and recording in multitrack (after 1960), which allowed recording engineers to mix the tracks from multiple microphones after the recording session in post-production. Furthermore, multi-track technology made it possible to record new tracks at a later moment than the initial recordings (a technique called *overdubbing*). Together, these technological improvements expanded studio practices and created a greater need for editing and mixing, which promoted the role of record producers to anticipate the choice of takes and supervise the reconstruction of the musical pieces in postproduction (Chanan, 1995).

Tape manipulation also created a need for "a new kind of performer [...], the virtuoso of the repeated take. [...] The biggest problem for the performer was not just being deprived of an audience, but the altered status of interpretation, especially in a situation where performance becomes fragmented" (Chanan, 1995). This new relationship to performance led to divergent points of view, as "expression and the impression of spontaneity become the objects of technique and control" (Chanan, 1995). According to Greene (2005), "Also accompanying the spread of sound-studio technologies come anxieties of engineering fakery: that studio-altered or fabricated sound products can *dupe* listeners into thinking that they are hearing an *authentic* recording of a performance event." Although editing is used first as a correction tool, Hamilton (2003) discussed the concept of "Creative editing" that "overcomes what is regarded as a compromise and uncertainty [...] of live performance." Listed below are a few examples of famous artists who were pioneers in the creative use of postproduction techniques in their musical genre. Glenn Gould (1966 quoted in Cox & Warner, 2004) argued that *posttaping* transcended a performer's limitations in achieving an accurate and personal interpretation of a composition. Miles Davis created music "by recording extended improvisations and then handing them over to his producer, Teo Macero, to edit and reassemble as he wished (Cox & Warner, 2004). The Beatles, in collaboration with their producer George Martin, went very far in their use of postproduction to produce hits[2].

Minimizing sound editing makes the final product closer to a live performance, while constructing the piece through editing creates a virtual performance. These divergent aesthetics question once again the status of musical recording as an artwork that either aims to differ from live performance or attempts to recreate the experience of live performance on a fixed medium. Edidin (1999) recognized three kinds of recordings: 1) *Recording as performance*; 2) *Composite recordings of compositions*; and 3) *Recording artifacts*. *Recording as performance* (1) refers to capturing the transience of performance, which we discussed previously as Attempting realism. *Composite recordings of compositions* (2) refers to the use of editing and mixing (e.g. Glenn Gould's and Miles Davis' approaches). *Recording artifacts* (3) refers to creating an art work that could not have been performed as such

[2]As an example, we encourage the reader to listen to the second track of the four-track master of Sergeant Peppers' Lonely Heart Club Band that contains the alternation of guitar and brass arrangements (YouTube video: Deconstructing Sgt. Peppers).

live, e.g. one guitarist overdubbing three synchronized guitar parts. The first two kinds of recording aesthetics (1-2) call to mind Patmore and Clark's classification based on the chosen reference, either the live performance or the composition; while the third one (3) is opposed to seeking any kind of authenticity. In other words, *Recording artifacts* (3) pushes Patmore and Clark's concept of *Creating virtual worlds* further. Hamilton (2003) specified that *Recording artifacts* (3) implied an inevitable interpretation by the engineer or producer, thus urging further development of both studio practices and studio professionals.

The introduction of digital technologies in the 1980s enhanced possibilities of creating *Recording artifacts* and became synonymous with limitless sound transformation using the Music Instrument Digital Interface protocol (MIDI) to control synthetic and pre-recorded sounds; Digital Audio Workstations (DAW) to record, mix and edit many tracks at the same time; digital correction tools and multi-effects (software or hardware) to change pitch, time, reverberation, and remove unwanted noise. Greene (2005) defined his concept of "wired sound as the basis of digital sound editing, effects processing, multitrack recording, and MIDI sequencing, practices that have powerfully impacted musical cultures and soundscapes around the world." The concept of *Using the studio as a musical instrument* to produce wired sound is further detailed in Théberge (1997), Greene (2005)and Moorefield (2005).

2.3 Economic evolution of the recording industry

2.3.1 The success of the disc industry led record companies to control the artists

The invention of sound reproduction revolutionized the way we listen to music, but the recording industry, first introduced with radio broadcasting, took off economically only after the introduction of the disc (78 r.p.m.) by Emile Berliner in 1894. Before the 78rpm, "there was no way to duplicate records, early recording engineers would have to line up ten or so phonographs"(Moorefield, 2005). With mass production, disc sales kept increasing until the 1970s, with a golden period between 1964 and 1969 when "total record sales

doubled reaching 1.6 billion dollars" (Peterson & Berger, 1975). Leyshon et al. (2005) explained the success of the 1960s as the development of the "sociological phenomenon of the teenager." Another explanation rests in the fact that the number of record labels and companies had been multiplied by four between the end of Second World War and 1960. According to Peterson & Berger (1975), a competitive market leads to innovation and diversity, which implies that the 1960's disc market provided a satisfying supply to a wide range of music lovers.

While post-production practices were emerging, record companies increased their control on the artistic creation of musical recordings: "By the end of the 1950s there was a whole generation of producers adept at manufacturing performers as well as records, in a process that made recording technology more important than musicality" (Chanan, 1995). Reciprocally, Kealy (1979) explained the perspective of studio professionals: "Further development in recording technology facilitated the rock musicians' involvement in the sound mixing process," which had a "critical effect on the sound mixer's ability to control the recording process." While Chanan saw producers taking too much artistic control, Kealy claimed that musicians took too much technical control. Interestingly, these two statements introduce the problem of shared roles and responsibilities in the context of collaborative recordings.

Throughout the 1960s, the number of record companies dropped by half and the ones that remained became major companies. However, the number of record labels[3] remained almost constant, each major label featuring divisions with independent and competitive producers (Denisoff, 1971 quoted in Peterson & Berger, 1971; Lopes, 1992). Throughout the 1970s, the market became controlled by a few major labels only, and in 1980, 76.5 % of the US market concentrated in four firms (Lopes, 1992). During the 1970s the recording industry experienced a recession with a decrease of record sales and percentages of new artists. This decline may have resulted from the spread of the audiocassette introduced in early 1970s. Indeed, this new portable media encouraged private listening in any situation and facilitated mass pirating (Chanan, 1995). But during this period, artists also reported increased artistic control from major record companies, which had a direct impact on quality and diversity of the production. Meanwhile, four and eight tracks tape machines were

[3] A record company can include several record labels.

portable and relatively cheap, allowing musicians to work from home without collaborating with major labels. However, at that time, artists returned to record labels to benefit from their marketing strategies and the competencies of their producers, engineers and Artists & Repertoire staff to make successful recordings (Chanan, 1995; Hennion, 1981; Leyshon et al., 2005).

2.3.2 Digital technology led to the delocalization of the recording studio

In the 1980s, record sales increased again as consumers re-acquired their L.P. collection on Compact Discs (CD), the new digital sound reproduction format introduced on the market by Sony and Philips in 1982. Although CDs at first had positive impact on sales, digital technology resulted in major upheavals in the recording industry: quick changes in studio practices (Dunaway, 2000) and the delocalization of traditional recording studios. Indeed, the affordability of digital audio equipment and the fear of losing artistic control motivated musicians to record in home studios: "a concomitant expansion of places and spaces where music can be recorded or presented" (Neuenfeldt, 2007), oftentimes artists' bedrooms. The specialized studio professions, i.e. record producer, recording engineer, editor, mixing engineer, mastering engineer, each corresponding to different stages of music production eventually disappeared in favor of "multiskilled" professionals handling the entire production process (Neuenfeldt, 2007). This reduction of the engineering team had a direct impact on recordings' sound quality, the 1980s being criticized "as one period in which much popular music began to sound the same: not only had the studio become a non-place but, in the process, it seemed that it had become incapable of producing original sounds" (Théberge, 2004). This difficulty of producing original sounds in the 1980s can also be explained by the massive use of MIDI (Musical Instrument Digital Interface), a technology that allows composers and arrangers to control synthetic sounds (most often in the form of factory designed presets) instead of recording performers. In this context, it became possible to produce a record with a very small team of artists and technicians using affordable computer-based tools.

The number of independent productions exponentially increased with the introduction of digital technologies in the 1980s. Théberge (2004) questioned why musicians left the

professional recording studio, that he described as "a very specific kind of place, made up of carefully engineered acoustic spaces, in which a variety of actors (artists, session musicians, producers and engineers), working with sophisticated technologies, come together to create a sound recording – to this notion of a placeless, virtual studio in which just about anyone with a computer, anywhere in the world, can participate in the recording of music." In this view, professional equipment, dedicated acoustics and qualified professionals disappeared in favor of computer-based tools. Chanan (1995) mentioned that in some cases, studio professionals were hired for the post-production only, i.e. editing and mixing after the recording session. While digital technology allows limitless corrections and signal processing in post-production, it cannot compensate for what is missing from a recording, such as enough magical takes to create a convincing artistic result, or the sound quality resulting from a professional recording of a real musician interacting with the acoustics of a room.

During the 1990s, the development of the Internet offered new possibilities for organizing work, and recordings started being produced in network studios, in which geographically dispersed home studios are connected by digital technologies to function as nodes in a network (Biddle et al., 2002). To build a song, artists and engineers could distribute individual tracks and pre-mixes amongst the project's collaborators throughout various production stages (Théberge, 2004). This new kind of organization implied virtual interaction between several geographically distributed artists and engineers without any face-to-face meeting. To conclude, in home studios and network studios, musicians themselves took over the control of their recording and musical creation, which threatened the established roles of studio professionals (Chanan, 1995).

2.3.3 Internet file sharing led to the decline of the traditional business model of record companies

Facilitated by the invention of the lossy[4] compressed audio format mp3[5] by MPEG[6] in 1991, illegal peer-to-peer exchange of musical digital files emerged in the late 1990s. Compared to piracy through the cassette 20 years earlier, digital technologies allow people to exchange music on a larger scale (Sterne, 2006). In the early 2000s, e-tailors started releasing digital music in mp3. In keeping with the way people illegally downloaded music, they focused on the sale of individual tracks instead of albums. "The industry argues that illegal copying and transferring of music over the Internet is increasingly acting as a substitute for sales, which reduces the inflow of capital to the industry that would otherwise be used for the discovery and the development of new acts" (Leyshon et al., 2005). Indeed, although global revenues from online distribution in music companies have increased by 1000 %, in seven years, investigators from the International Federation of the Phonographic Industry found that overall musical sales fell by around 31 % between 2004 and 2011 (IFPI, 2011). This significant decrease of sales generated a serious downturn in revenues (IFPI, 2009; Laing, 2004), proving that the commercial success of online distribution does not prevent the decline of the recording industry in general (Burgess, 2008).

According to the British Recorded Music Industry report (BPI, 2010), unlicensed download sites, newsgroups, specialized search engines, forums, blogs and cyberlockers are all responsible for the explosion of massive Internet piracy, as well as peer-to-peer exchange without payment. Furthermore, artists voluntary allow free Internet streaming in order to promote their music through social networks such as Myspace Music that combine artists' profiles and portfolios for amateurs as well as professional musicians (Antin & Earp, 2010). In other words, the Internet has transformed the way listeners access music.

In the current sharing context, sound quality is not deemed critical: although digital files can be copied with the exact same quality as the original, most musical files are exchanged

[4] Lossy audio compression formats discard information that may not be heard according to psychoacoustic models, as opposed to lossless audio compression formats that encode data in a smaller file from which the original file can be reconstructed.

[5] Mp3 refers to MPEG-1 or MPEG-2 Audio Layer III.

[6] Motion Picture Experts Group

and sold through lossy compressed audio formats. While the transmission rates of Internet and the storage devices have greatly evolved since the invention of mp3 in 1991, consumers still listen to low resolution formats that introduce audible artifacts (Pras et al., 2009). This common lack of interest in sound quality may not motivate artists and record companies to invest in the production process. It is worth noting, however, that High-Resolution audio formats were also introduced on the market in the late 1990s as an alternative to CD and lossy compressed audio formats. These High-Resolution audio digital formats, first commercialized on DVD-Audio and SACD[7], and now available on Blu-ray and online for paid download, are an attempt to overcome the limitations of the CD standard (Rumsey, 2007). Although today, sound engineers commonly use High-Resolution formats to record music, their commercial success is still uncertain. However, the development of these formats demonstrates concerns for quality improvement, both from audio professionals and from audiophiles.

In the new economic paradigm, major record companies no longer invest money in developing a new artist's career (David, 2010). Consequently, the number of local artists who signed to record label has drastically decreased in various countries, e.g. -60 % fewer new artists were signed to record labels in France between 2002 and 2009 (IFPI, 2010). Jouvenet (2007) detailed the new organization of record labels based on a sociological theoretical framework, specifically for rap and electronic music. He explained how record labels are no longer interested in listening to musicians' demos; they instead judge artistic enterprises that are already commercially well established (Jouvenet, 2007). Furthermore, in most cases, contracts with record labels are signed only for the distribution of albums that were entirely produced by musicians. Moreover, Jouvenet described the gap between labels – willing to collaborate with artists able to develop a global view of their project – and artists – wanting to keep control over their music. According to McLeod (2005), the decline of major labels generates more artistic freedom and creativity than traditional record companies did in the past. At first, economists believed that new artists would benefit from this new business organization: Anderson (2010) proposed The Long Tail theory that fewer units will be sold of more albums. However, music sales reports and recent studies contradict Anderson's theory, e.g. the economist Will Page (Foster, 2008 quoted in Day, 2011) found that 85 % of albums online never sold a single copy. Very talented

[7]Super Audio Compact Disc

musicians who do not have business skills often fail in promoting their music themselves. Furthermore, we question how musicians can handle these multiple responsibilities: the production and promotion of their project, in addition to composing, arranging, practicing and performing music. To conclude, Day (2011) argued that there is still a need for record labels to help the development of young artists' career.

The Internet spread music all over the world more efficiently than traditional radio broadcasting that privileged big cities with large markets. As a direct consequence of the globalization of music access, new musical mixtures and influences appeared in emergent countries. Due to the rapid expansion of middle classes in the global cultural economy (Appadurai, 1990 quoted in Greene, 2005) and decreasing costs of audio technologies, studio practices have only recently developed in emergent countries around the world (Greene, 2005).

2.4 Interdisciplinary framework

2.4.1 Intersection point of several academic fields

Very little work has been done to make explicit the contribution of record producers and sound engineers in the collaborative creative process of musical recordings. To date, most of the academic literature refers to the recent area of Sound Studies (Pinch & Bijsterveld, 2004) that focuses on the use of technology and vocabulary to describe sound (Horning, 2004). Competences and methods to achieve the best musical performance during recording sessions have received scant attention; and the distinction between the role of sound engineer and the role of record producer has been under-investigated. The profession of record producer itself lies at the intersection of music, technology, acoustics, and management. Indeed the craft of recording stands between art and sciences and requires multiple skills. Hence its investigation is based on an interdisciplinary framework that straddles different bodies of literature.

2.4.2 Knowledge Management

Record producers and sound engineers organize and conduct recording sessions, thus their role is also comparable with management roles in other contexts. Thus this investigation of studio professionals' best practices calls for an interdisciplinary approach grounded in the field of Knowledge Management, a branch of Information Studies that examines human practices and their social aspects. This recent field addresses professionals' knowledge, skills and competences (KSC), how these KSC are transferred and how they can be expressed by words (Winterton et al., 2006). Knowledge Management studies the concept of Communities of Practice (CoP) defined by Wenger (1998; 2000) as organizations that help workers learn from each other and allow tacit knowledge to be transferred using dedicated methods of learning. Regarding motivation and organization, a musical ensemble can be assimilated to a CoP as its members are very likely to be passionate with the same music aesthetics and to share the same artistic practice that is usually based on tacit knowledge. However, when recording in the studio, musical ensembles do not aim to transfer knowledge and thus their goal differs from CoP's. Moreover, we are interested in the interaction between studio professionals and musicians, not in the work mechanisms of the musical ensemble. Hence the framework of our investigation addresses two other research areas in Knowledge Management described below, i.e. the documentation of tacit knowledge and the definition of mediating roles in production.

2.4.3 Tacit knowledge

"The concept that best describes the skills of recording engineers is tacit knowledge – the unarticulated, implicit knowledge gained from practical experience" (Horning, 2004). Polanyi introduced the concept of "tacit knowledge" (1958; 1983) to describe knowledge we cannot learn from reading a manual, as opposed to "explicit knowledge" that can be expressed in words. This concept was popularized by Nonaka & Takeuchi (2007) and extended by Dalkir (2005) who listed four properties of tacit knowledge: "1) Ability to adapt, to deal with new and exceptional situations; 2) Expertise, know-how, know-why, and care-why; 3) Ability to collaborate, to share a vision, to transmit a culture; and 4) Coaching and

mentoring to transfer experiential knowledge on a one-to-one, face-to-face basis". Tacit knowledge is often transferred on the job through an apprenticeship model Nonaka & Takeuchi (2007) and amongst communities of practices (Wenger, 1998; Wenger & Snyder, 2000). Lately, making tacit knowledge explicit became a research interest in the field of Knowledge Management, for example to improve organizational competitiveness (Hamza, 2009). As modern home studios cannot generate the same social components as traditional studios, record producers' and sound engineers' tacit knowledge and specialized vocabulary need to be transferred by formal training (Porcello, 2004). Hence there is a need to document the tacit part of studio practices, which is mainly the management part, as musical and technical skills can be formalized.

2.4.4 Intermediating roles

In an ethnographic study of French recording studios for pop production, Hennion (1981) described the role of record producers as intermediaries between production and consumption, in other words between the artists and their audience. In this view, Bourdieu defined cultural intermediaries (1984) as "a group of workers who play an active role in promoting consumption through attaching particular meanings to products and services". Record producers are comparable with publishers in charge of commissioning, editing, typesetting, manufacturing, promoting, selling and distributing (Morris, 1999), who thus can be seen as information intermediaries (Womack, 2002) between authors and readers. Moreover both professions are threatened by free access to information online. However, the comparison presents limitations: while editors provide feedback and guidance to the author(s), they do not have to deal with the psychology of performance. Moreover, the use of technology is omnipresent in the creative process of musical recording but only a final step in writing. Nevertheless, the profession of record producer can be compared with other managing roles in artistic production involving technology and real time collaborative work, i.e. filmmaker, actor director (Proust, 2006) and photographer. These managing roles may be examined in the field of artistic creation studies that has received increased attention with the development of art programs in universities but without well-defined methodology yet (Danétis, 2007).

Jyrämä (2008) investigated the roles of mediators in knowledge creation and developed a model adapted from Ahola et al. (2004) and Jyrama & Ahola (2005) that illustrates different levels of mediating roles in the context of project production, namely 1) Support mediator that gives credibility and means; 2) Team mediator that is involved in an integral part of the discussions; 3) Managing mediator who is the driving force, essential in bringing different parties together; and 4) Producer mediator, of crucial importance because of his/her expertise. Although this literature on mediating roles provides interesting insights on the concept of intermediary between production and consumption in management, the methodology used to collect and analyze the data in order to design models illustrating those mediating roles was not fully described in the articles, making it difficult to decide whether of not they would be applicable to our context.

2.4.5 Music in Information Studies[8]

Music Information Retrieval emerged in the late 1990's as a research field bringing together researchers from information studies, engineering, music, computer science and the private sector with the common goal of providing access to music information in the comprehensive way that such access is provided for textual materials (Downie, 2003). While research in Music Information Retrieval builds upon the text information retrieval literature, music challenges a number of core concept in textual Information Retrieval, such as the central notion of relevance and legal obstacles to the development and use of shared standard collections for evaluation. In addition, the fast increasing amount of music files available on the Internet creates new challenges for content management. Despite recurring calls for a greater focus on users, research attention in Music Information Retrieval remains overwhelmingly systems-focused (Downie et al., 2009). Weigl & Guastavino (2011) reviewed empirical investigations of user requirements and interaction with Music Information Retrieval systems and highlighted the importance of other people in music-information seeking behaviour: music listeners discuss music with their friends (Taheri-Panah & MacFarlane, 2004), rely on their taste to select new music (Laplante, 2010, 2011) and use social networking tools to share music preference and dislikes. A hot topic in Music Information Retrieval

[8]This thesis does not address the field of Music Librarianship, as it is not dealing with musical collections.

is the design of recommendation systems that allow listeners to discover new music, in an attempt to replace the old tastemakers (friends, traditional labels, record dealers and record producers). While quality control mechanisms exist for specific information sources, e.g. peer reviewing for research articles, such mechanisms are not applied to musical recordings. Recommendation systems rely on content-based similarities between files (Pachet et al., 2001) and/or collaborative filtering, but struggle with quality indicators (Downie, 2003). On the other hand, promotion for new music occurs on web blogs, forums and social networks, which affects album sales (Dewan & Ramprasad, 2009). The analysis of this online information provides insights on which recording will potentially be successful; and thus it has recently garnered attention from researchers in Music Information Retrieval to improve recommendation systems (Casey et al., 2008).

2.5 Conclusion

Following the invention of sound reproduction, the musical recording rapidly became a unique type of artwork on its own differing from live musical performance (Hamilton, 2003) in the same way that films differ from live acting performance. As in the case of films, the production of musical recordings gave rise to a collaborative process comprised of both an artistic team and a technical team. In the analog era (until the 1970s), studio practices evolved in parallel with technologies with the constant goal of improving the quality of musical recordings. Studio professionals developed knowledge and expertise (Horning, 2004) following different approaches: either to represent live performances or to create virtual sound worlds (Edidin, 1999; Patmore & Clarke, 2007).

The democratization of digital technologies in the 1980s created limitless possibilities in post-production and resulted in the delocalization of professional recording studios in favor of home studios (Neuenfeldt, 2007), where computer-based tools are expected to replace large hall acoustics, highly specialized equipment and studio professionals' competencies (Théberge, 2004). It became possible to produce musical recordings with virtual instruments (MIDI), which not only reduced expenses but also collaboration between musicians and studio professionals. While digital technologies generated technical advances to pro-

duce musical recordings, they present a real threat for studio professions: in addition to forcing professional studios to close, they gave birth to "*prosumers*", defined by Cole (2011) as people who self-identified as "*pro-fessionals*" because they "*con-sume*" technology. Little by little, these prosumers have challenged the boundaries of amateurism and professionalism, a phenomenon that is not exclusive to the field of musical recording but also impacted on the field of photography (Larsen, 2008).

At the end of the 1990s and in the 2000s, the use of the Internet to exchange recorded music quickly and freely has brought about the economic decline of the recording industry (Burgess, 2008). Indeed, "around 95 per cent of music tracks are without payment to the artist or the music company that produced them" (IFPI, 2009). While file sharing is responsible for the breakdown of the traditional business model of record companies since they can no longer invest money in album production (David, 2010), the new paradigm creates more artistic freedom (McLeod, 2005) and allows free promotion for the artists (Antin & Earp, 2010). To investigate studio practices in this new paradigm of the digital era, we will take into consideration the impact of digital technologies on studio practices, in keeping with Orlikowski & Scott (2008) who showed the need to establish connections between technological advances and work in organizations. This study of studio professionals' best practices will be based on qualitative methodology to examine tacit knowledge through practitioners' verbal descriptions. Furthermore, we will extend the theoretical frameworks of Hennion's concept of "intermediary between production and consumption" (1989), Bourdieu's definition of cultural intermediaries (1984) and Jyräma's model of mediating roles (2008) by identifying a model of record producers' levels of artistic involvement. Finally, our findings will be contrasted with the role of actor directors thoroughly investigated by Proust (2006).

Part I

Musicians' expectations when collaborating with studio professionals

Chapter 3

The role of music producers and sound engineers in the current recording context, as perceived by young professionals

The following chapter has been adapted from:

Pras, A. & Guastavino, C. (2011)The role of music producers and sound engineers in the current recording context, as perceived by young professionals. *Musicae Scientiae*[1], *15*(1), 73.

The questionnaires that were designed for this study are available in Appendix A. The coding scheme of the analysis is available in Appendix F.

[1]Musicae Scientiae (the Journal of the European Society for the Cognitive Sciences of Music) publishes empirical, theoretical and critical articles directed at increasing understanding of how music is perceived, represented and generated.

3.1 Introduction

Before the digital era, music labels hired artistic producers to handle their new musical projects (Hennion, 1989). The choice of musicians, composers and projects depended on the evaluation of commercial viability, as well as the specific culture of the label. The artistic personality of the producer had to match with the label's aesthetics. For each project, producers chose the technical crew (engineer and assistant engineer), recording studio and recording equipment (Reisman, 1977). Advances in new technologies, including the use of the Internet to exchange music and promote artists, have changed the organization of modern music production (Théberge, 2004). As a result, musicians tend to produce their music themselves in home studios (Jouvenet, 2007), without necessarily collaborating with a label or a professional producer during the recording process. In order to understand how these changes affect musical recordings, we need first to make explicit the current role of the producer and the sound engineer in a recording session.

In this new context, the role of the producer tends to be confused with the role of the sound engineer. Although the two professions traditionally required different skills and competencies, the distinction between the two has become less obvious. Because of financial constraints and the accessibility of new digital tools, producers now tend to be in charge of both roles at the same time (Burgess, 2008; Neuenfeldt, 2007). On the other hand, as musicians do not necessary hire a professional producer when they record their project, sound engineers may have to handle more than just technical responsibilities, and thus require multiple skills (Neuenfeldt, 2007). In our study, we consider the role of the producer and the role of the sound engineer separately. However, in the following paragraphs of this introduction, we will use the term "record producer" used in the literature to designate a music or artistic producer, who may have sound engineering skills.

"A record producer is responsible for the sound shape of what comes out" (George Martin, producer of The Beatles, quoted in Lewisohn, 1992). To be able to achieve this goal, all professionals and authors agree that a record producer must have "good ears" (Neuenfeldt, 2007; Patmore & Clarke, 2007; Reisman, 1977; Zager, 2006). This broad expression generally implies the ability to identify, rate and modify the different parameters

of music performance, composition and arrangement, as well as sound quality (including the acoustics of the instruments, the room, and audio settings). "Good ears" can also be understood as the aptitude of "listening as engaged hearing" (Carter, 2004), as well as the self-control of staying objective and keeping "fresh creative ears" in every situation (Neuenfeldt, 2007; Zager, 2006). As "it can be problematic for artists to critique their own work" (Zager, 2006), the record producer provides an extra set of ears, "he or she represents the public to the artists" (Hennion, 1989). Daniel Zalay, record producer of classical music with more than 20 years of experience, advises his students "to train their ears as a musical instrument," suggesting that our listening skills improve with practice[2]. According to him, record producers should systematically explore many technical and artistic possibilities through critical listening and experimentation, just as performers practice their instrument daily. By doing so, they develop the flexibility needed to propose multiple choices best suited for each situation. Indeed, in the current context, most young producers can't afford to specialize in one musical aesthetic. Their own interests guide them to explore different artistic worlds, but they can't rely exclusively on their own aesthetic to please all musicians' requests. They therefore have to develop critical listening skills to be able to adapt their approach to different musical genres. To do so, they are encouraged to analyze and compare the production of existing records (Zager, 2006), "all types of products and hit qualities" (Reisman, 1977).

Listening and hearing can also be used in the double meanings of "sound vibrations and socio cultural vibrations"(Neuenfeldt, 2007). Music creation can't be separated from the culture of musicians and composers who constitute the project: "every music system is predicated upon a series of concepts which integrate music into the activities of the society at large and define and place it as a phenomenon of life among other phenomena" (Merriam, 1964). Thus, record producers, as "professional listeners" who can't specialize in only one musical genre anymore, must learn to "hear cultures" (Carter, 2004)and "adapt their technical work practices" (Neuenfeldt, 2007) as well as the artistic process of the recording sessions accordingly. Let's illustrate this statement with a personal observation of the first author from a recording of an Afro-Cuban traditional ensemble. In a concert-lecture the day before the recording, the musicians explained how their music revolved

[2]Welcome meeting of the Formation Supérieure Aux Métiers du Son, Conservatoire National Supérieur de Musique et de Danse de Paris in September 2002. Confirmed by email in December 2008.

around the vocal leader, whose musical intentions determine the musical response from the rest of the ensemble. In this ensemble, the vocal leader also happened to be a percussionist. In order to avoid leakage from the voice to his percussion microphones during the recording session, the leader was invited to sing very quietly during the takes with the entire ensemble, and later asked to overdub his vocal in isolation. While the sound quality reached the record producer's expectations, the recording process didn't allow the natural dialogue between the vocal leader and the rest of the ensemble as in the concert. Although the recording process was not adapted to the specificities of their music, the musicians didn't question the decisions made by the record producer. Based on this observation, it may be the record producer's responsibility to make trade-offs between technical constraints and musical aesthetics. To accommodate cultural specificities and esthetic choices, record producers may want to listen to the music and discuss the process with the musicians prior to the recording.

Not only young producers have to adjust to different musical genres, but also they have to do so while working independently. As a result, they need to learn how to use new equipment every time they work in a new location, unless they have their own studio or work repeatedly in familiar ones. Because of technological evolution, "there has been a concomitant expansion of places and spaces where music can be recorded" (Neuenfeldt, 2007). They therefore have to carefully prepare and organize recording sessions in pre-production with specific constraints (besides preliminary discussions with the artists to understand the cultural specificities of their music).

The role of record producers is also to bring creative ideas while respecting the socio-cultural references of the music. Record producers have to "create virtual worlds," as "making a recording can't be a transparent process"(Patmore & Clarke, 2007). In their case study, Patmore and Clarke have identified "pre-conditions" to making successful recordings based on John Culshaw's approach to recording Wagner's operas. In addition to good preparation by the performers and the record producer, the authors mention creative methods such as longer takes and creation of movement in the recording space, while still respecting the composer's vision. These scenario-based methods are appropriate in the context of operas, but they may not be well suited for others forms of composition. To summarize, record producers are expected to propose creative ideas adapted to the speci-

ficities of the music, in the same way they design their recording setup and the flow of the session.

"No successful recording can ever be made without perfect cooperation between the Artists and Repertoire man and the technicians" (Neuenfeldt, 2007). Like a manager, "the producer is the person who brings it all together" (Levitin, 1992). In his manual, Zager (2006) claimed, "record producers are essentially music critics and amateur psychologists". Based on the ten years of experience of the first author, the biggest challenge in music production is communication, from the first meeting to the mastering of the final product. Merely having the technical and musical knowledge required to get the music together as a whole and through the speakers is far from enough. The musicians' intuitive feelings have a stronger influence on their choice of a producer than references or portfolio. Indeed, during the recording process, record producers have to "deal with the psychology of performance and cultural diversity in the workspace" (Neuenfeldt, 2007). Musical projects often bring together people with different backgrounds, nationalities and languages. Also, "musicians, as a group, find it difficult to separate their own personal identities from their musical abilities" (Kemp, 1996). Therefore, record producers have to know how to communicate with and adapt to different musicians' language with tact when receiving criticisms or suggestions, as well as to avoid sounding "overly technical" (Zager, 2006).

Based on previous literature, a record producer is a "multi-skilled" professional (Neuenfeldt, 2007) who has to demonstrate strong abilities to communicate with the artists and the technical team, and be very organized. Preparation is a crucial part of the production process; record producers have to take into consideration the cultural specificities of the music before planning the recording set-up and the session organization. In a recording context, musical timing differs from concert situations: interruptions, repeated takes and focus on instants or isolated details hinder homogeneity throughout the piece (Chanan, 1995). This difficult process may therefore require specific preparation from the performers.

Our study aims at identifying relevant concepts and consensus in order to document the role of artistic producers and sound engineers in the present day. An open questionnaire was sent to young professionals currently involved in recording sessions to collect their spontaneous verbal descriptions. We highlight similarities and differences between the ideal

roles of artistic producers and sound engineers. We then contrast this with respondents' self-reported studio experiences with an emphasis on the interaction with the producer and the sound engineer. Finally, we investigate how respondents prepare for a recording, and specifically how the musicians' preparation for recording differs from preparation for a concert.

3.2 Methods

The questionnaire was sent by email to all 75 participants of the 2008 International Jazz Workshop at the Banff Centre, a renowned arts, cultural, and educational institution in Alberta, Canada. Both musicians and sound engineers were invited to participate, without pay, one week before the workshop.

3.2.1 Participants

Twenty-two respondents (29.3 % response rate) filled out the questionnaire: 19 males and three females, 16 musicians and six sound engineers. Their mean age was 26 ($SD = 3.5$) and they came from nine different countries on five continents, namely Canada (9), USA (5), New Zealand (2), Panama (1), France (1), Germany (1), Denmark (1), Bulgaria (1), South Korea (1). They had 14 years of musical practice on average ($SD = 4.8$). Sixteen out of 22 (73 %) of the participants reported playing at least two different musical instruments, and all instrument types were represented (acoustic, electric, electronic, vocal, etc.). All of the musician respondents were actively playing jazz, big band, and free improvisation but 12 out of 16 participants (75 %) also reported playing other musical genres (classical, contemporary, electro-acoustic, pop, rock, R&B, latin, ska, reggae). Before the workshop, two out of 6 (33 %) sound engineer respondents had recorded jazz, two worked mostly in classical music while four were trained in classical music but worked mostly in popular music. In terms of background, participants from Western countries typically had classical music training, while participants from other countries were initially trained in traditional music. All respondents had several years of studio experiences. For musicians, the mean was

seven years, ($SD = 3.8$) with three to four sessions per year on average; for sound engineers, the mean was six years ($SD = 4.1$) with 32 sessions per year on average. Respondents[3] reported themselves as producing 33 % of the sessions they were involved in. 32.5 % were produced by a musician in the band or the whole band and 17.5 % by an external artistic producer. 17 % of their sessions were not produced. In total, 15 out of 22 (68 %) of the respondents reported having produced at least one recording session. This is in agreement with the current trend for musicians to produce their own music, and for sound engineers to take over the role of producer.

3.2.2 Questionnaire design

The questionnaire consisted of five questions, in addition to the ones concerning the respondents' background in terms of musical training, studio experience and demographic information. In order not to influence or confine the answers into predefined categories, we used questions with very general terms. The full set of questions is included in Appendix A. In the first two questions, participants were asked to describe the roles of the ideal producer and the ideal sound engineer. Then, they were invited to think about positive and negative experiences working in studio, to describe their interaction with the producer and the sound engineer during these sessions and to specify the context. The six sound engineers were also asked to describe their interaction with the musicians, but only one of them did so. In the last question, we asked participants how they prepared for a recording session, if it differs from the preparation for a concert (specifically for the musicians), and if so, to describe the difference.

3.2.3 Analysis

We used the constant comparison technique from Grounded Theory (Glaser & Strauss, 1967) to extract the emergent concepts from the free-format data and make explicit potential consensus in order to classify the resultant concepts into larger categories. First,

[3] The distribution of responses was similar for musicians and sound engineers, so we collapsed over all respondents.

we analyzed the answers regarding the role of the ideal producer and then tried to achieve a similar classification (into categories and sub-categories) for the role of the ideal sound engineer (refer to Appendix F for the full coding scheme). In a similar way, we categorized the descriptions of the interaction with producers and sound engineers related to the respondents' studio experiences. Then, we analyzed separately the question on the studio preparation. To highlight differences and similarities between the roles of producer and the sound engineer, we contrasted the resulting concepts inside each category and sub-category. Then, we outlined the differences between the results from the theoretical questions (ideal roles) and the respondents' related studio experiences (both positive and negative). Finally, we compared our findings with previous descriptions of record producers discussed in the introduction.

3.3 Results

3.3.1 Q1. Role of the ideal producer

All respondents answered the first question. In total, 121 phrasings ($M = 5.5$ per respondent, $SD = 3.3$) were extracted from the data. 72 % of the phrasings came from musicians' answers and 28 % from sound engineers' answers. The phrasings were coded into 25 Concepts (Capitalized throughout the chapter), grouped into ten **Sub-categories** (indicated in bold and capitalized) and then into three main CATEGORIES, namely MISSION, SKILLS and INTERACTION. The classification of the concepts is presented in Figure 3.1. It should be noted that results are presented in terms of number of occurrences, and not in percentages, as one complete answer can include several phrasings coded into the same or different concepts. For the role of the ideal producer, 42 % of the phrasings refer to the MISSION, 46 % to the required SKILLS and 12 % to the INTERACTION with the musicians and the sound engineer. A chi-square test with Yates' correction (one frequency less than 5) revealed no significant differences between the answers' distribution into the three main categories for musicians and sound engineers (χ^2 (2,121) = 5.41, p = 0.12, ns). So we collapsed the results over both groups of respondents in Figure 3.1.

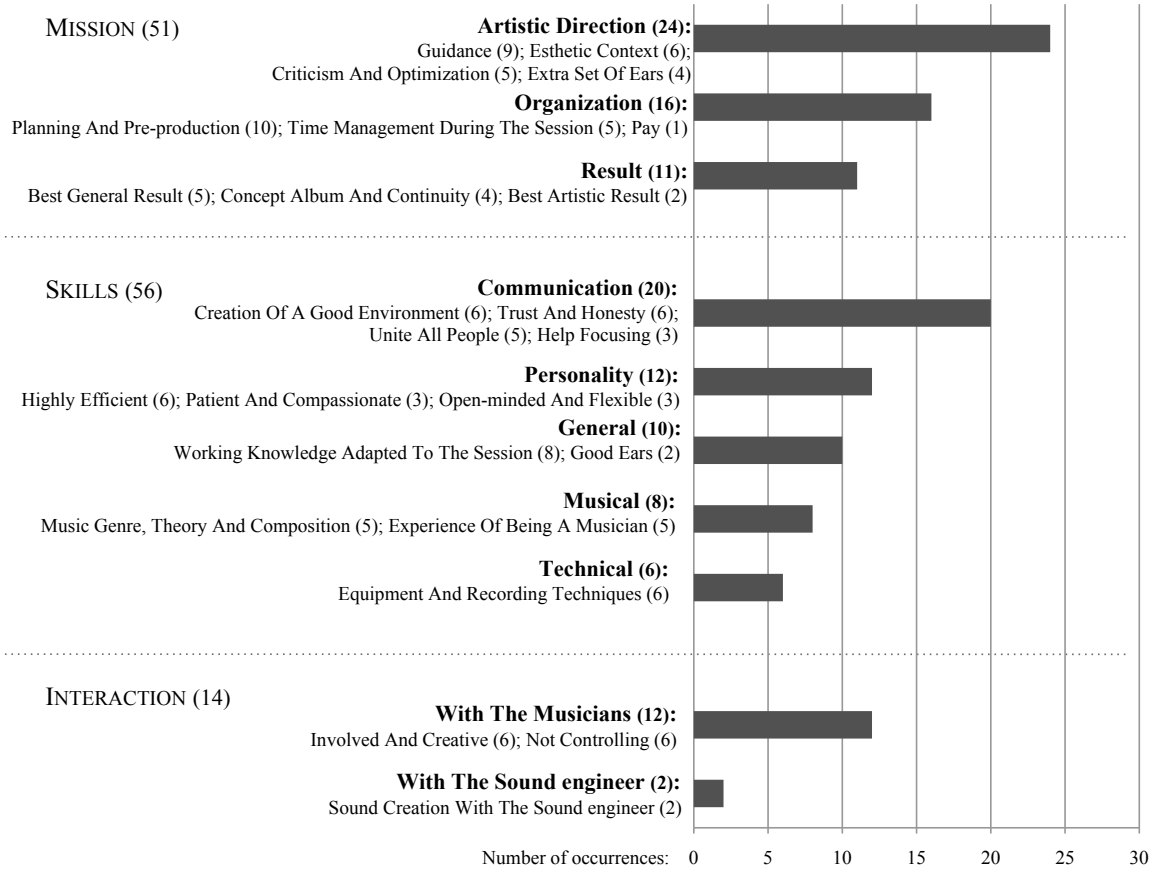

Figure 3.1 The role of the ideal producer

Within the MISSION category, the predominant sub-category is **Artistic Direction** (24 occ.), consisting primarily of the concepts Guidance; Esthetic Context; Criticism And Optimization; Extra Set Of Ears. Within the SKILLS category, it is **Communication** (20 occ.) followed by **Personality** (12 occ.).

3.3.2 Q2. Role of the ideal sound engineer

All respondents answered the second question. In total, 87 phrasings ($M = 4$ per respondent, $SD = 2.4$) were extracted from the data. 62 % of the phrasings came from musicians'

answers and 38 % from sound engineers' answers. The phrasings were coded into 19 Concepts, grouped into eleven **Sub-categories** and then into three main CATEGORIES, once again MISSION, SKILLS and INTERACTION. The concepts' classification is presented in Figure 3.2. For the role of the ideal sound engineer, 42 % of the phrasings refer to the MISSION, 51 % to the required SKILLS and 7 % to the INTERACTION with the musicians and the producer. A chi-square test with Yates' correction (one frequency less than five) revealed a significant difference between the answers' distribution into the three main categories for musicians and for sound engineers (χ^2 (2, 87) = 9.39, $p = 0.03$). So we present here the differences over both groups of respondents. However, when we provide the results from the comparison between both roles, we will put together all the results concerning the ideal role of the sound engineer.

Within the MISSION category, the predominant sub-category is **Sound Choices** (14 occ.), consisting primarily of the concepts Appropriate Sound; Respect Of The Artists' Request; Suggestions. Within the SKILLS category, it is **Personality** (16 occ.) followed by **Technical** (12 occ.).

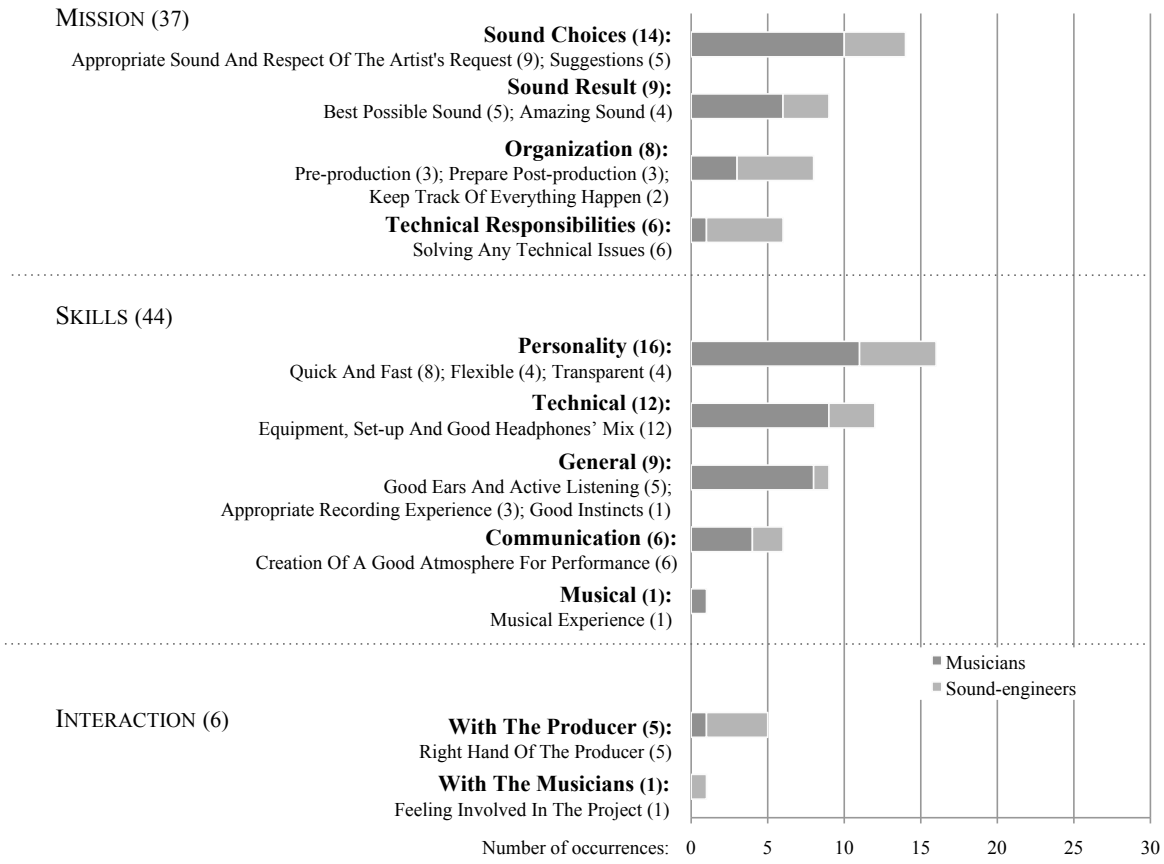

Figure 3.2 The role of the ideal sound engineer

3.3.3 Comparison between the roles of producer and sound engineer

For each of the three main categories, we compared the distributions of occurrences for questions 1 (role of producer) and two (role of sound engineer). The results are presented first in terms of similarities, i.e. concepts that are common to both producer and sound engineer, and then in terms of differences, i.e. concepts that are specific to a given profession.

3.3.3.1 Mission

The similarities between both roles concerning the MISSION category are presented in Figure 3.3. Under **Artistic Direction**, we observed qualitative differences in the way concepts are expressed: producers are expected to provide Criticism And Optimization during the recording session while sound engineers are expected to give Suggestions. Similarly, sound engineers are expected to create an Appropriate Sound And Respect The Artist's Requests while producers are responsible for the Aesthetic Context. Only producers are expected to Guide the musicians and to provide an Extra Set Of Ears. They are also responsible for the Time Management During The Session as well as the Best Artistic and Best General Result of the end product. Sound engineers are responsible for the **Sound Result**. They are also expected to Solve Any Technical Issues in the studio as well as Keeping Track Of Everything Happening and Preparing For Post-production.

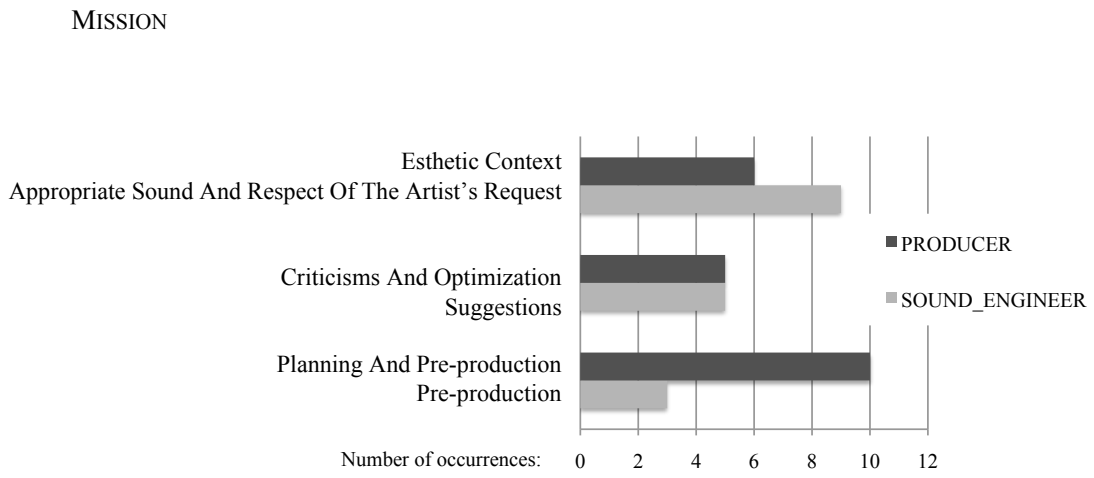

Figure 3.3 Comparison between the missions of the ideal producer and the ideal sound engineer

3.3.3.2 Skills

The similarities between both roles concerning the SKILLS category are presented in Figure 3.4. Under **Personality**, we also observed qualitative differences in the way concepts are expressed: producers are expected to be Highly Efficient while sound engineers are expected to be Quick And Fast. Similarly, producers are supposed to be both Flexible And Open-minded while sound engineers are only supposed to be Flexible; producers have to Create A Good Environment while sound engineers have to Create A Good Atmosphere For Performance. Producers only are expected to Allow Trust And Honesty In The Studio, Unite All People as well as Help Focus The Session. They are also supposed to have a Good Knowledge Of The Music Genre, Theory And Composition. Producers' role requires being Patient And Compassionate, while sound engineers are expected to be Transparent.

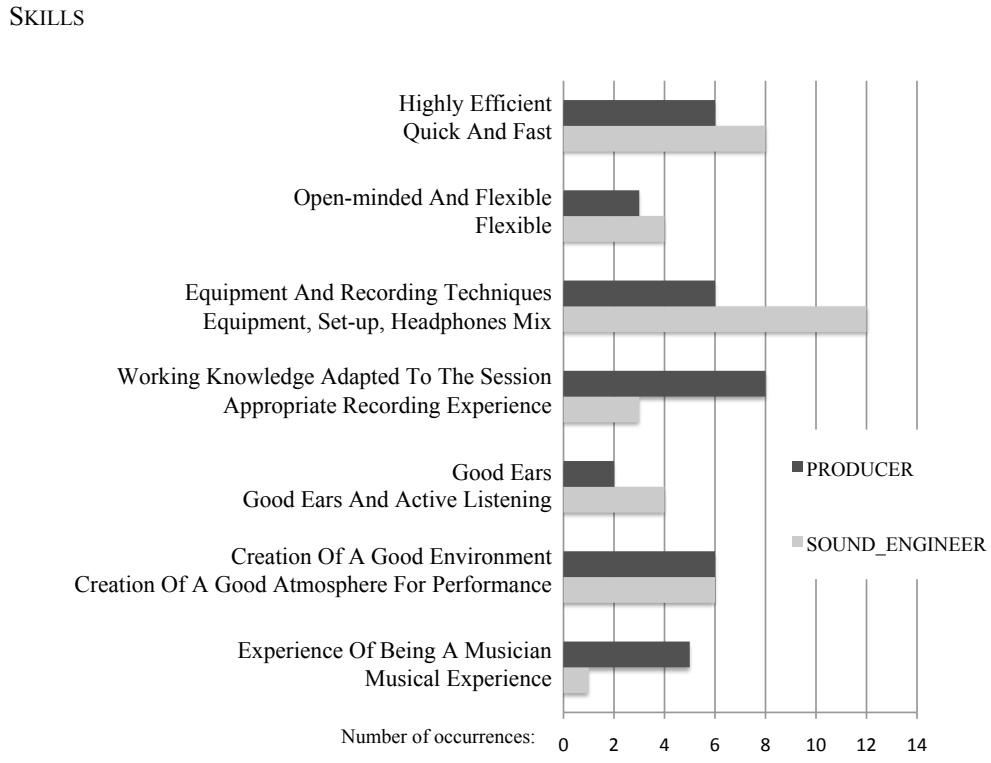

Figure 3.4 Comparison between the skills of the ideal producer and the ideal sound engineer

3.3.3.3 Interaction

No similarity emerged within the INTERACTION category. Regarding **Interaction With the Musicians**, only one response referred to the sound engineer's role while 12 responses referred to the producer's role. Furthermore, **Interaction Between The Sound engineer And The Producer** is reported differently in questions 1 and 2: the producer is described as expected to collaborate on the Sound Creation With The Sound Engineer (Q1, 2 occ.); while the sound engineer is expected to be the Right Hand Of The Producer (Q2, 5 occ.)[4].

3.3.4 Q3-4a. Role of the producer in self-reported studio experiences

3.3.4.1 Positive experiences

Thirteen respondents (eleven musicians and two sound engineers) reported positive experiences with the producer in the studio, using a total of 40 phrasings.

Regarding the MISSION category, 13 phrasings refer to **Artistic Direction**: the same concepts as on question 1 (role of the ideal producer) were observed, but with an emphasis on the producer's involvement: "*to inspire the musicians for another take*; *to challenge them*; *to encourage them to seek out different possibilities*; *to help them to develop a critical mind*; *to add his opinion*." Eight phrasings are related to **Organization** and the **End Result**, with the same codes as in the results for the role of the ideal producer.

Regarding the SKILLS and INTERACTION categories, 16 phrasings refer to **Communication Skills** and the producer's **Interaction With The Musicians**. The same concepts

[4] In this case (Q2), the concept implies a hierarchy between the producer and the sound engineer and not just a collaboration (Q1).

as on Q. 1 (role of the ideal producer) were observed, but with specific actions or skills the respondents appreciated in the producer: "*he knew when we were not feeling good*; *he knew how to talk to us*; *he balanced listeners and musicians' concerns*; *any objections were being discussed and considered, and solutions were figured out*". Three phrasings refer to **General Skills** with the same codes as in the results from question 1. We noted the absence of phrasing concerning **Musical** and **Technical Skills** of the producer.

3.3.4.2 Negative experiences

Eleven respondents (nine musicians and two sound engineers) reported negative experiences with the producer in the studio, using a total of 28 phrasings. Regarding the MISSION category, all three phrasings refer to **Organization** and Time Management During The Session (no reference to **Artistic Direction** or **End Result**). Regarding SKILLS and INTERACTION, nine phrasings refer to **Communication Skills** and the producer's **Interaction With The Musicians**. Two concepts are related to concepts identified in Q. 1 regarding the working environment and the producer's involvement, namely Negative Vibe (6 occ.) and Too Much Controlling (2 occ.). A new concept Clarity was identified and illustrated with negative phrasings (5 occ., e.g. "*lack of clarity*, *not precise*, *confusing*"). Concerning the other SKILLS sub-categories, we observed concepts identified in question 1: five phrasings refer to **Technical Issues**, five phrasings refer to **Personality** problems ("*stressed out*", "*get noticeably annoyed*"), one phrasing refers to a lack of **Musical Skills**. Also, one sound engineer respondent reported a problem of **Interaction With The Producer**, who systematically "*added his comments to my comments to the musicians*".

To summarize, the analysis of the studio experiences provided further insight on the producer's involvement during the session and confirmed the importance of **Personality** and **Communication Skills**.

3.3.5 Q3-4b. Role of the sound engineer in self-reported studio experiences

3.3.5.1 Postive experiences

Ten respondents (nine musicians and one sound engineer) reported positive experiences with the sound engineer in the studio, using a total of 22 phrasings referring to SKILLS and INTERACTION, but not MISSION. Nine phrasings refer to **Communication Skills** and the sound engineer's **Interaction With The Musicians**: namely the concept Create A Good Environment (4 occ.) and a new concept that didn't appear in previous questions regarding Explanations (5 occ.), illustrated as "*the sound engineer explains to the musicians what he is doing.*" Four phrasing refer to **Technical Skills**, nine phrasing refer to the **Personality Skills**, namely Passive (4 occ.); Ready To Roll when the musicians need to (3 occ.); Friendly (1 occ.) and Professional (1 occ.).

3.3.5.2 Negative experiences

2.3.5.2 Negative experiences. Eleven respondents (nine musicians and two sound engineers) reported negative experiences with the sound engineer in the studio, using a total of ten phrasings. Under the MISSION category (eight phrasings in total), three phrasings refer to **Technical Responsibilities**, two of which specifically related to Technical Issues, and one related to Backups illustrated in "*failed to backup the files*". In addition, three phrasings refer to **Organization** and Time Management During The Session and two to Imposing Sound Choices. In terms of SKILLS and INTERACTION, two phrasings were collected, both referring to **Personality Skills** as Not Flexible, Not Fast Enough.

3.3.6 Q5. Studio preparation

3.3.6.1 Musicians' preparation

The results concerning the musicians' preparation for a recording session are presented in Figure 3.5. In total, 15 musicians answered that question, 38 phrasings were extracted from the data and coded into four sub-categories: **Musical** (15 occ.), **Physical** (12 occ.), **Sound** (7 occ.) and **General Preparation** (4 occ.).

Thirteen respondents (14 phrasings) answered the sub-question about the differences between the preparation for a recording session and a concert. Eight respondents (9 phrasings) describe how recording sessions differ from a concert situation: More Challenging, Stressful, Long, Requiring More Preparation And Concentration (6 occ.) vs. Less Stressful Than A Concert (1 occ.); two phrasings refer to Isolation And Headphone Issues during recording sessions.

Interestingly, only five respondents (5 phrasings) mentioned how they prepare differently for a recording: Prepare More (2 occ.); Chill Out More (1 occ.); All Factors Of Producing To Decide (1 occ.); Dress Up For A Concert (1 occ.).

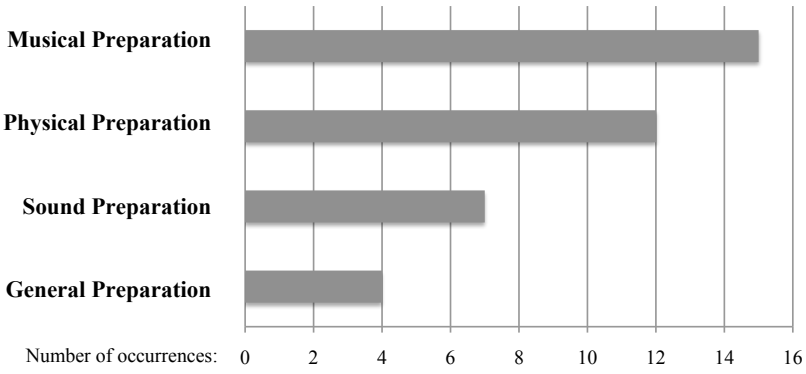

Figure 3.5 Musicians' preparation for a recording session

3.3.6.2 Sound engineers' preparation

The results concerning the sound engineers' preparation for a recording session are presented in Figure 3.6. In total, five sound engineers answered that question, 28 phrasing were extracted from the data and coded into three sub-categories: **Collecting Musical Information** (14 occ.), **Technical And Sound Preparation** (11 occ.), **Planning** (3 occ.).

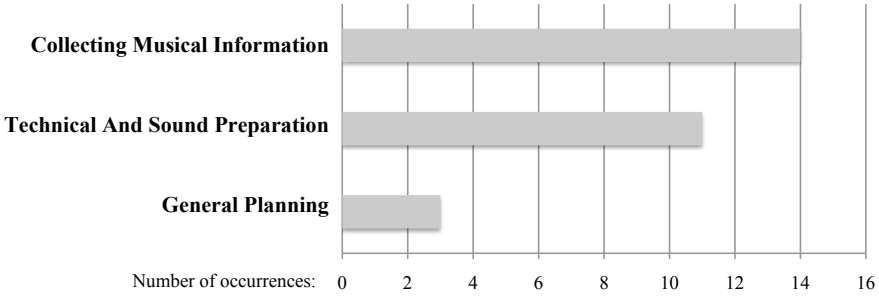

Figure 3.6 Sound engineers' preparation for a recording session

3.4 Discussion

The International Jazz Workshop of Banff, established in 1974, attracts musicians and sound engineers through a very selective admission process. This international population was selected to reflect the views of talented professionals from all over the world with several years of studio experience. It should be noted that the Banff Centre is more likely to attract musicians and sound engineers coming out of institutions than self-taught professionals. Although the respondents were all active in jazz and improvised music, the vast majority also played other musical genres such as classical music, popular music or traditional music. Given their low average age, our respondents had worked primarily in the context of digital studio recording. Therefore our research findings may not correspond to older professionals with longer studio experience and further research is required to investigate this population.

On methodological grounds, we contrasted theoretical questions regarding the perceived roles of the ideal producer and sound engineer with self-reports of past experiences in the studio. The purpose of our study was to identify relevant concepts and consensus using the participants' own words, not to generalize to the entire population. We used open questions in order not to constrain their responses into categories pre-defined by the experimenter. Although our participants reported that only 17.5 % of their recording sessions were produced by an external artistic producer, they described the producer's role in very similar terms to the traditional role of an external producer reported in the literature. Furthermore, they differentiated the roles of the producer and the sound engineer, although a single person often handles both roles in the current context of recording (Burgess, 2008; Neuenfeldt, 2007). These two observations suggest that the recent changes in the record industry have not yet affected the perception of studio professions, even for young professionals who work in the studio in different conditions.

3.4.1 The role of the producer

A consensus emerged regarding the role of the producer. His or her primary mission is to guide the musicians as an artistic director of the project. In keeping with the literature, the producer has to provide an objective and critical point of view according to the aesthetic context of the music being recorded. However, the level of involvement and artistic decision-making gave rise to different qualitative evaluations. When reporting positive studio experiences, musicians appreciated a lot of input from the producer; but in theoretical questions and when reporting negative experiences, they commented on producers being too intrusive. This trade-off illustrates the producer's challenge: to artistically direct and provide guidance but "without controlling the musicians".

To do so, producers must exhibit certain communication and personality skills. Results from the different questions converge to show that producers are expected to create a good environment and "allow trust in the studio", which is in agreement with previous literature. However, musical and technical skills are barely mentioned by our respondents. This leads us to question how the producer can artistically direct the project without relying on musical skills. Indeed, although the artistic quality of the recording primarily depends

on the composer and musicians, the producer has to guide them with the material they provide to achieve the best possible product. How can he or she handle this challenge without a strong knowledge in music and sound? This observation could suggest that the way in which producers communicate their critiques and suggestions is perceived as more important than what is being communicated. Or perhaps our respondents took for granted that producers should have musical and technical skills and thus didn't mention them explicitly.

Similarly, the producer's interaction with the sound engineer has barely been mentioned. Producers do not need the same technical skills as sound engineers (unless they handle both jobs), but it is unclear how producers can get the right sound if they a) do not have the appropriate technical knowledge themselves, and b) do not communicate with the sound engineer. Furthermore, having "good ears" is presented in the literature as the producer's most important ability, providing the ultimate tool to evaluate the music and sound quality of a recording. However, surprisingly, this concept has been barely mentioned by our respondents (only 4 occ. in total). This could be attributed to democratization of production, e.g. the fact that musicians tend to produce their music themselves without consulting with professional listeners.

3.4.2 The role of the sound engineer

Another consensus emerged regarding the role of the sound engineer. His or her primary mission is to make sound choices by taking into consideration the requests of the musicians and the aesthetic of the project. In keeping with the literature, the idea of "good sound" refers to the sound well suited to the project. However, in the theoretical question, the musician respondents didn't mention the sound engineer's interaction with the musicians in the studio. In addition, personality skills listed for the ideal sound engineer support this view since he or she is described as being quiet, transparent and passive. But how can the sound engineer comply with the musicians' requests to create the sound they want without communicating with them? Paradoxically, when reporting positive studio experiences, musicians appreciated and commented on the sound engineer's explanations about what he or she was doing. Similarly, when reporting negative studio experiences, not

a single respondent complained that the sound engineer was too present or too involved. This paradox illustrates how the sound engineer must use tact to be able to create a sound that pleases the musicians.

Similar to the producer, the sound engineer is responsible for a good atmosphere for performance. More specifically, he or she is expected to free the musicians from technical concerns in the studio, so that the music doesn't suffer from technical issues. In the digital context of studio recording, technical problems always occur and must be fixed quickly so that the recording can be made and the data can be safely stored. However, surprisingly, in the theoretical question and when reporting positive experiences, musician respondents barely mentioned technical responsibilities for the sound engineer. Similarly, the number of descriptions of sound engineers' personality skills outnumbers descriptions of technical skills. However, when reporting negative experiences, musicians complained about technical issues and loss of data attributed to a lack of technical skills. Together, these findings suggest that musicians assume that sound engineers are responsible for the technical aspects of the recording but only mention this responsibility when something goes wrong. These findings suggest that musicians first expect strong interpersonal skills and only remember the primary responsibility of the sound engineer, namely to ensure that the technical set-up is effective, when technical issues hinder the recording process. In the context of digital technologies, technical issues are more likely to arise during sessions than when relying on analog equipment maintained daily by the studio in the past. As a result, sound engineers should be prepared to trouble-shoot technical issues. But based on our observations, musicians do not seem to be aware of this reality.

3.4.3 Studio preparation and organization

In this section, we summarize the findings relating to organization and studio preparation for both producers and sound engineers. Results from the different questions converge to show that organization and session preparation are perceived as a crucial part of both the producer's role as well as the sound engineer's role, as noted in the literature. However, further research is needed to investigate the division of tasks. During the recording session, time management was attributed to the role of the producer, but file backup and detailed

note taking were mentioned for both the producer and the sound engineer's roles. These aspects are critical in the current recording context, given that a number of parameters can vary throughout the project, including changes in technical team, equipment, software and physical location. Hence a detailed documentation and systematic backups of the various steps are required to bring a project to completion while ensuring its continuity. However, in the current context of music production, there are no established rules regarding these responsibilities, so the division of tasks has to be clearly defined between the different agents of the recording session in pre-production.

Furthermore, in keeping with the literature, we observed converging evidence for the need of both producers and sound engineers to gather musical background information prior to the recording session. Indeed, this specific preparation is directly related to the mission of taking the aesthetic context into consideration (mission of the producer), and making appropriate sound choices (mission of the sound engineer). Most sound engineer respondents mentioned collecting musical background information as an integral part of preparing for a session, more critical than technical preparation and planning. It should be noted that most sound engineer respondents reported often having to handle the producer's role, which is in keeping with the literature (Neuenfeldt, 2007). However, even though the majority of musician respondents reported producing sessions, only one of them mentioned producer-specific preparation as a difference between studio and concert preparation. Musicians producing their own session may not need to collect background musical information, as they are familiar with the music, but they still need to plan and organize the recording session if they have to handle the producer's role.

3.5 Conclusion

Although we have found a consensus concerning the producer's role and the sound engineer's role, we have also observed several concepts and paradoxes that require clarification. First, the level of artistic involvement during a recording session was identified as the main challenge for the producer and needs to be further investigated during actual recording sessions and complemented with interviews. Regarding producers' skills, further research

will look into the relative importance of communication skills, listening skills, musical and technical knowledge, and how these competences affect credibility and quality. Based on the exploration of the free-format responses of this first study, we would like to further investigate how the sound engineer interacts with the musicians in order to achieve an appropriate sound in the context of a specific project. Furthermore, surprisingly, most musician respondents did not report specific studio preparation strategies, although they mentioned that recording sessions were more tiring and harder to handle. Therefore, we would like to elaborate on the musicians' preparation for recording sessions to help them better prepare for productive studio sessions.

During the same workshop, we had also conducted an experiment that included pre-production meetings, recording sessions and feedback questionnaires. We will soon be able to provide our results, and compare them with the emergent themes we have extracted from this first study. To complete this investigation of the recording context, we will interview a population of professional producers, selected to represent different generations, backgrounds and musical genres. Then, observations will be conducted throughout studio sessions that involve a producer and a sound engineer to identify different artistic processes used by professionals to achieve the best possible product. Finally, we will theoretically compare recording sessions to other artistic practices like filmmaking (Patmore & Clarke, 2007), photo-shoot and theatre production.

3.6 Aknowledgements

We want to thank Theresa Leonard, Dave Douglas and Barry Shiffman for their support at the Banff Centre. Furthermore, we would like to thank Aaron Rosenblum, Mark Nelson, James Clemens-Seely and Maryse Lavoie for their comments on earlier drafts. The writing of this chapter was supported by an FQRSC (Fonds Québécois de Recherche sur la Société et la Culture) doctoral fellowship to the first author.

Chapter 4

Improving the sound quality of recordings through communication between musicians and sound engineers

The following chapter has been adapted from:

Pras, A. & Guastavino, C. (2009). Improving the sound quality of recordings through communication between musicians and sound engineers. In *Electronic proceedings of the International Computer Music Conference (ICMC)*[1], Montreal, QC, Canada.

The questionnaires that were designed for this experiment are available in Appendix B.

[1]ICMC is a major international forum for the presentation of the full range of outcomes from technical and musical research, both musical and theoretical, related to the use of computers in music.

4.1 Introduction

The current context of musical recording is affected by economic, social and technical changes (Théberge, 2004). Indeed, the amount of new music being recorded every day continually increases while professional studios are closing. Traditionally, producers and sound engineers were chosen for their sound and their artistic personality (Reisman, 1977). In the current context, they have to adjust to different musical genres and tend to be directly hired by musicians[2] instead of being selected by record companies. At the same time, musicians tend to produce their own music in home studios (Jouvenet, 2007) and do not necessarily collaborate with professionals from the inception of the production. In this new paradigm, the expectations and objectives of each of these stakeholders are poorly defined.

In a previous study, we investigated the role of the producer and the sound engineer in the current recording context, as perceived by young professionals (Chapter 3). A consensus emerged that both producers and sound-engineers are expected to take into consideration the aesthetic of the project in order to achieve the best possible product. To do so, they are supposed to gather background musical information before recording in order to make appropriate technical choices (e.g. recording techniques, session set up).

For the sound recording process, the sound engineer is expected to accommodate the wishes and requests of the musicians. However, paradoxically, the sound engineer was expected by the same respondents to be transparent and passive. Moreover, interactions with the musicians were barely mentioned for sound engineers, but commonly mentioned for producers who were expected to exhibit strong communication and interpersonal skills. In the current recording context, sessions often take place without a producer; so sound engineers often have to handle the communication and organization aspects.

Based on our previous study, we hypothesize that improving communication between musicians and sound engineers before recording sessions would help accommodate the musicians' expectations in terms of sound quality. To test this hypothesis, we developed a

[2]Throughout this chapter, the term "musicians" includes composers, arrangers, performers and musical assistants.

method that aims to help the musicians make explicit their expectations in terms of sound quality before the session, followed by a debriefing after the session. To do so, we collected focus group interviews in pre-production meetings and individual questionnaires in post-production.

4.2 Methods

4.2.1 Participants

We sent an e-mail invitation to all 75 participants of the 2008 International Jazz Workshop at the Banff Centre, a renowned arts, cultural, and educational institution in Alberta, Canada. We invited them to participate without pay in free recording sessions in the context of a research project. As an incentive for participation, we offered to provide them with a mix of the resulting tracks that they could potentially use as a demo.

Thirty-four professional musicians (29 males and five females from nine different countries), grouped in seven bands, agreed to participate in the study. Bands were formed during the workshop and consisted of four to six musicians. Prior to the session, band members rehearsed together for five to 15 days and gave a public performance. In addition, some musicians had been playing together before the workshop. Various musical genres were represented, namely one free jazz project (five tunes), one pop song, one vocal jazz project (four tunes), two original jazz projects (four tunes each), one electronic jazz project (three tunes) and one experimental jazz project (three tunes by a double trio: two drums, two basses, two saxophones). All the tunes were original compositions written by musicians, except for one arrangement.

Four sound engineers (three males and one female, $Mean\ age = 28$, $S.D. = 6.1$) from three different countries participated in the study. They reported an average of 14.5 years of musical practice ($S.D. = 4.0$) and 6.9 years of studio experience as sound engineers ($S.D. = 4.7$). They selected sessions on the basis of their musical preferences and for each session, they chose an assistant amongst the other sound engineer participants. The free jazz session re-

quired two sound engineers for technical reasons (one had to sub-mix the drums tracks on a separate board while the other was dealing with all the other instruments). Four sessions were conducted with one sound engineer and one assistant; two sessions were conducted with a single sound engineer due to scheduling conflicts. The producer for all recording sessions was the first author.

4.2.2 Questionnaire Designs (available in Appendix B)

4.2.2.1 Pre-production questionnaire

In the pre-production meetings, musicians were first asked to describe the musical genre of the compositions they were about to record, and then asked if they had a particular sound in mind for the session. In order to collect more accurate sound descriptions, we invited them to think about different sound criteria and recording set up possibilities by providing examples such as musician separation, overdubbing, amount of reverberation or stereo image. Then, we asked them to provide us with references regarding sound quality in relation to the session (either their previous recordings or recordings from other artists). Other questions addressed studio preparation and musicians' expectations from the producer but in this chapter we focus on questions regarding sound creation and sound quality.

4.2.2.2 Postproduction questionnaire

The postproduction questionnaire included two questions to gather feedback on sound quality, specifically: 1) if the participants were satisfied with the sound quality, 2) if they thought the sound corresponded to the wishes expressed at the pre-production meeting. This questionnaire was sent two months after the workshop, so we reminded participants of the sound quality wishes expressed by the band in the pre-production meeting.

4.2.3 Procedure

One or two days before each recording session, the producer organized a pre-production meeting with the band and the sound engineer(s). All sound engineers and 27 (out of 34) musicians (including all band leaders) attended the meetings. There, the producer helped musicians reach a consensus on music and sound descriptors as well as specific requests for the session. To moderate the focus group, the producer followed a semi-structured interview guide and reported the consensus outcomes in writing. Sound engineers were encouraged to ask the musicians for more details. When musicians did not make explicit requests on specific sound criteria, the producer encouraged sound engineers to make their own choices. To help sound engineers get a firm grasp of the music, they were asked to listen to the references provided by musicians, and to attend live performance and/or band rehearsals before the session. Based on this preparation, sound engineers translated musicians' requests into technical requirements and planned the recording set-up accordingly (microphones, effects and instrument placement).

Once in the studio, the first author produced the session by ensuring that the sound engineer respected the musicians' requests in term of recording set up and the sound described in the pre-production meeting. To do so, the producer mediated between the musicians' wishes and the technical constraints of the sound engineers, with an emphasis on maintaining the musicians' perspective as much as possible. Discussions between the producer and the sound engineers always took place in the control room in the absence of musicians, so that the musicians would attribute all sound choices to the sound engineer. Musicians would then feel free to report on the sound quality to the producer in post-production, hence minimizing experimenter bias. The recording sessions lasted four to seven hours, including technical set-up, for an average of a 15-minute demo. This session timing is relatively short compared to a real-life situation.

For the post-production (editing and mixing), musicians had already left the workshop but the sound engineer(s) were asked to finalize the project. Two months later, we sent individual emails to all participants with a link to download the mixed tracks. We asked them to listen to the files, and then fill out the post-production questionnaire. We sent this questionnaire to all participants (musicians and sound engineers) individually so that they

would feel free to express any concern they might have without any peer-pressure. In total, 14 participants returned the post-production questionnaire, including all sound engineers and six (out of seven) band leaders.

4.3 Results

4.3.1 Pre-production meetings

The distribution of music and sound descriptions, as well as session requests for each band is presented in Table 4.1.

Bands	1	2	3	4	5	6	7
Music							
Name of musical genre(s)	✓	✓	✓	✓	✓	✓	✓
Instrumentation	✓	✓	✓		✓	✓	✓
Structure / Concepts	✓	✓	✓			✓	
Arrangements / Intruments' roles	✓	✓	✓				✓
Comparison with other artists	✓	✓	✓				
Sound							
Band set-up	✓	✓	✓	✓	✓	✓	✓
Individual instruments	✓	✓	✓	✓	✓	✓	
Global color		✓	✓	✓	✓	✓	
Tune color			✓	✓	✓	✓	
Session's flow	✓	✓	✓			✓	
Stereo image					✓		✓
Recording techniques	✓				✓		

Table 4.1 Music and sound descriptions and session requests for each band.

Musical genres of the bands: 1: free jazz; 2: pop song; 3: vocal jazz; 4: original jazz (1); 5: original jazz (2); 6: electronic jazz; 7: double trio experimental jazz.

4.3.1.1 Music description

To describe the music they were about to record, all seven bands named musical genre(s), six of them detailed the instrumentation, five of them provided details of their music such as structure, rhythms, and creation concepts (e.g. “latin rhythmic with swing”; “we determinate the different combinations of instruments and if the end is organic or not”), four of them highlighted the arrangement and instruments’ roles (e.g. “in free, the bass has an harmonic role shared with the horns”) and three of them compared their music to other artists (before we specifically asked them).

4.3.1.2 Sound description

To describe sound expectations, all seven bands mentioned the band set up in the studio (room or baffles separation, necessity to see each other, band’s position), six of them detailed the sound for individual instruments (e.g. “dry and dark sound for the horns”; “piano not too bright but with clarity”), five of them mentioned the global color of the recording (e.g. “warm sound”; “natural room”; “bleed”), four of them detailed the sound color for each tune (e.g. “reverb and electric sound”), four of them gave us details regarding the session’s flow (in terms of order of tunes, overdubbing, possibility of punching, reverb in headphones), two of them gave us details regarding the stereo image of the recording and two of them mentioned some recording techniques (such as close miking and different set-ups for the same instrument depending on the tune).

4.3.1.3 Sound references

All bands except one named famous artists whose sound quality they wished to emulate. In total, they provided us with references for 15 albums or artists, four labels or sound engineers and only one personal previous recording (in the same studio). The references were specific to each band except the artist Ornette Coleman and the label ECM, which were cited twice.

4.3.2 Postproduction feedback

4.3.2.1 Sound quality

All musician respondents reported being generally very satisfied with the sound quality of their recording. However for five out of seven bands, sound engineers expressed reservations regarding the sound results and explained what they could have achieved better and how. Technical constraints (e.g. room acoustics) were mentioned twice along with solutions on how to address them if they had to do it again. Besides general comments, musicians specifically mentioned the sound quality of individual instruments (five occurrences, e.g. "the bass has a very natural and warm sound") and the global sound color of the recording (two occ., e.g. "there is a great room sound").

4.3.2.2 Correspondence with the sound described in pre-production meeting

All respondents (musicians and sound engineers) reported that the sound result corresponded completely (ten respondents) or very closely (four respondents) to the sound described by musicians in the pre-production meeting. For three bands, the sound engineer also mentioned that the musicians were pleased with the sound, which suggests that musicians expressed their satisfaction during or right after the session.

4.4 Discussion

Our results from the individual post-production questionnaire validate the proposed method to accommodate the musicians' expectations regarding sound quality, consisting of focus group interviews on pre-production with specific questions. Moreover, our findings run against a common belief in the sound engineering community, namely that musicians cannot make sound quality criteria explicit. While musicians might have difficulties describing sound quality in technical and specialized terms, all musicians in our study were able to convey their expectations for sound quality according to the specificities of their music. Indeed, following our procedure, musicians were first invited to reflect upon and describe their music, and then to highlight their expectations in term of sound quality according to the project's aesthetic before the recording session. Most requests were related to the band set-up in the studio and the session flow. Only a few of them addressed specific sound criteria such as stereo image and recording techniques. Similarly, not a single musician named a specific microphone or piece/brand of equipment to be used during the session. Thus, by proceeding this way, the roles of musicians and sound engineers are clearly defined: musicians as musical experts who express their expectations in term of sound quality related to their music; sound engineers as professionals who use their knowledge and experiences to choose appropriate equipment and recording techniques according to the music's constraints.

Furthermore, our results question the common perception that sound quality is an exclusively subjective factor. By asking the band to come to a consensus regarding music and sound descriptions, we allowed musicians to exchange ideas among themselves in their own words. Indeed, this interaction among musicians within the band increased the amount of musical and sound quality information available to the sound engineer, who could then ask for any clarification needed to define sound objectives. To summarize, this method relies on two stages of the communication flow: among musicians in the band, and between musicians and sound engineers.

However, to describe music with words is always challenging, so we also encouraged the sound engineer to listen to the band in live performances or rehearsals in order to be di-

rectly immersed in the music. Furthermore, the sound engineer was invited to listen to the musicians' references before the recording session (artists, albums, labels, previous personal recordings). This listening part of the preparation process must have created high expectations for sound engineers as it helped them to define a specific sound objective to achieve. That may be why most of them voiced reservations about the sound results. However, all sound engineers agreed that the sound result corresponded to the musicians' descriptions given in pre-production. This implies that the sound result that pleases musicians may not please the sound engineer at the same level. Indeed sound engineers may be more critical and may want to push the sound creation further to reach their personal expectations (but this may be beyond the scope of the project given time constraints). Although two sound engineer respondents mentioned technical difficulties, they always proposed a solution to tackle the problem if they were to re-do it. So, instead of getting frustrated or feeling limited by musicians' constraints, sound engineers were inspired to explore new possibilities offered by the musical context and develop new skills.

4.5 Conclusion

Our findings provide evidence that sound quality can be optimized through specific preparation and exchanges amongst musicians as well as between musicians and sound engineers. The proposed method helps musicians come to a consensus within the band and make their sound quality wishes explicit to the sound engineers. This method also helps sound engineers define a specific sound objective and stimulates their creativity to achieve this goal. This method can be adapted to any recording situation. Indeed, the sound engineer can conduct the pre-production meeting following our procedure, even without a producer. In the case of musicians producing their own music without a sound engineer, we encourage them to answer the pre-production questionnaire with the other musicians before making technical decisions.

In future studies, we would like to extend this study to bands that have been playing together for a longer time within more clearly defined musical projects. Furthermore,

we will extend our investigation of the recording context to other producers to minimize potential experimenter bias.

4.6 Aknowledgements

We want to thank Theresa Leonard, Dave Douglas and Barry Shiffman for their support at the Banff Centre. Furthermore, we would like to thank Aaron Rosenblum and Mark Nelson for their comments on earlier drafts.

Part II

Record producers' best practices

Chapter 5

Record producers reflecting upon their recording approach and the future of the recording industry

The following chapter has been adapted from the third section of:

Pras, A., Lavoie, M., & Guastavino, C. The impact of technological advances on recording studio practices. *Journal of the American Society for Information Science and Technology*. Under revisions.

The interview guide that was designed for this study is available in Appendix C.

5.1 Introduction

In this chapter, we are interested in documenting the perspective of experienced and successful record producers on the evolution of studio practices. Specifically, we want to investigate how recent changes in studio technologies and in the recording industry have impacted their recording approach and their career. A comparatively recent artistic market, the recording industry has been in constant reconstruction since the invention of sound reproduction in the late nineteenth century. Between the 1900s and the 1970s, broadcast and record companies selected artists to finance, manage and promote their musical recordings. The introduction of digital technology in the 1980s jeopardized this business model and gave rise to more independent production. At the end of the 1990s, the increasing use of the Internet for music sharing resulted in the economic decline of the traditional business model of record companies. According to Burgess (2008), studio professions encounter a transitional phase and need to be reinvented. Tera consultants in England anticipated that more than one million jobs will disappear from the creative industry in Europe by 2015 if piracy is not addressed (2010).

5.1.1 Technological and economic advances of the recording industry

> "What came first? Guitar amplifiers or rock n'roll?"[1]

We showed in the first section of the literature review (Section 2.2 on page 14) that studio professions evolved throughout the 20th century from a very technical role to a more artistic role. Current technologies offer unlimited possibilities for recording, editing and mixing. As a result, studio professionals have become more and more knowledgeable and responsible for their aesthetic choices. Throughout the history of audio technology, they most often developed tacit knowledge and competencies to produce musical recordings by means of apprenticeships while working in recording studios with more experienced professionals (Pinch & Bijsterveld, 2004). With the demise of traditional recording studios, the transfer of studio professionals' tacit knowledge no longer takes place on the job but rather

[1] Common saying in audio technologies

through Internet tutorials, master-classes, lectures and manuals in formal programs offered by educational institutions (Porcello, 2004).

We showed in the second section of the literature review (Section 2.3 on page 20) that the recording industry was going through a transitional phase. Studio professionals now negotiate directly with their clients, the artists, who finance their recording projects themselves (Jouvenet, 2007). Sound engineers are no longer associated with a particular sound or a particular record company, and they have to be able to record a wider range of projects. Moreover, the boundaries between the roles of record producers and sound engineers tend to blur, as in many cases, a single studio professional handles multiple roles at once (Burgess, 2008; Neuenfeldt, 2007). But according to Culshaw's opinion, the artistic result of a production depends on the producer's collaboration with the artists as well as the technicians (Patmore & Clarke, 2007). With the decline of the traditional business model of recording companies, limited budget prevent record producers from collaborating with a technical team. Young producers have to adapt to this new situation and consequently, studio practices are changing. In order to study the impact of this economic context on studio practices, we first need to document the collaborative artistic process of musical recordings.

5.1.2 Producing musical recordings, traditionally a collaborative work

In the analog era, at least three professionals were involved in any musical recording, namely an Artist & Repertoire staff (also commonly named the executive producer), a record producer and a sound engineer (Kealy, 1979). The Artist & Repertoire staff managed the budget and ensured the respect of the label's aesthetics by selecting the musical projects and hiring record producers whose artistic personality matched the label's culture.

Record producers were responsible for the artistic result and hired the technical crew for production (Albini, 1994; Hennion, 1981; Reisman, 1977). Two types of producers existed: staff producers who received a regular income from a record company and independent producers who received advance fees and royalties and who were free to work with artists signed to different record companies (Reisman, 1977). According to Peterson & Berger

(1971), record producers played a managerial role for the recording project in a "non-routinizable" way. As an example, to earn the trust of the artists so as to achieve a successful recording, they had to behave both like music critics and amateur psychologists (Zager, 2006). In an investigation conducted by Keepnews (1967 quoted in Peterson & Berger, 1971), one record producer even characterized himself as a wet nurse and psychiatrist.

The term *sound engineer* included several specific professions corresponding to different production stages: 1) recording engineer (for the recording session), 2) sound editor (for editing: selecting different takes from the recordings to construct the final musical piece), 3) mixing engineer (for mixing: balancing the different sources and adding effects to finalize a sonic image of the musical piece), and 4) mastering engineer (for the last stage of musical production: correction and optimization of the product for a specific audio format).

In a previous study, we investigated the perspective of young musicians and sound engineers on the roles of studio professionals in the current recording context (Chapter 3). Using open-ended questionnaires, we identified consensual concepts regarding the roles of the artistic producer and the sound engineer. According to our respondents, the producer is responsible for the artistic direction of the project by taking into consideration its aesthetic context, while the sound engineer is in charge of making appropriate sound choices by taking into consideration the musicians' requests. These roles are in keeping with the roles described in the literature review based on the traditional business model of recording studios. This suggests that the recent changes in the recording industry have not yet affected the perception of studio professions for young professionals.

In this chapter we investigate the perspective of world-renowned practitioners on the advancement of their profession. These are the result of semi-structured interviews with six record producers of international caliber whose portfolios are exceptional and span more than 20 years of experience. Questions address their recording approach and the impact of recent technological advances on their career path.

5.2 Methods

5.2.1 Data collection

We conducted semi-structured interviews between April 2009 and May 2011 in Montréal, Paris and New York with six producers recruited from the first author's professional contacts in the recording industry. The interviews lasted about one hour and took place in the interviewee's work environment. We first conducted one interview after which questions were added or rephrased according to the participant's suggestions. The final interview guide included eight open questions addressing producers' career path and best practices for music production. These questions were derived from our previous study on musicians' expectations when collaborating with studio professionals (Chapter 3). In this chapter, we focus on the analysis of two main themes, namely on 1) the interviewee's recording approach, and 2) how the recent changes of the recording industry have impacted their career.

5.2.2 Participants

We interviewed six record producers, five males and one female, each of them with outstanding portfolios[2] and at least twenty years of experience working in studio. All of them are still active record producers. Five out of the six interviewees also teach record production in academic institutions. The same five producers can also engineer recording sessions. Our group represents different musical genres, cultures and backgrounds. Indeed, four interviewees record classical and contemporary music. The other two cover a wide range of musical genres from pop rock to jazz. Three interviewees are self-taught or learnt on the job, while the other three received formal Tonmeister training, a recording concept invented by Schoenberg to record classical music (Borwick, 1973). The *Tonmeister concept* is described in the result section according to interviewees' practice. In terms of career paths, three interviewees used to work as staff producers for major labels and/or broadcast stations

[2]including prize-winning musical recordings (e.g. Grammy Awards) with internationally renowned artists in their musical genre

(and one still does), while the other three have mostly worked as independent producers throughout their careers. In addition, three producers work primarily in North America and three in Europe. Details of background, career and culture for each participant are provided in Table 5.1 (a more complete table is available in Appendix D). We assigned an ID to interviewees according to their career profile: C for classical and contemporary music, P for pop-rock and other genres, S for producers who worked as staff for several years, I for producers who have mainly worked as independent.

5.2.3 Analysis

The interviews were audio recorded and fully transcribed. Throughout each interview, we first extracted content related to our research questions, i.e. the producers' recording approach and their opinion on the recording industry's recent changes. Our analysis relies on Grounded theory, an inductive method of theory development using constant comparison of qualitative data (Glaser & Strauss, 1967). This method consists in isolating statements that develop a specific concept and then classifying the established concepts into categories. This allowed us to analyze each interview in depth and later identify relationships between concepts across interviews. The last interview we conducted and analyzed confirmed that we had reached data saturation (no additional concept or relationship emerging).

Results will be presented in two parts: the analysis that refers to 1) **Recording approach**, and the analysis that refers to 2) **Recording industry**. Regarding producers' **Recording approach** (1), four categories emerged from the data, namely *The art of recording music*, *Comparison of recording aesthetics among musical genres*, *Studio challenges and producers' involvement*, and *Comparison with other practices*. Regarding producers' opinion on the evolution of the **Recording industry** (2), we identified four categories, namely *Business changes*, *Roles and hierarchy*, *Technical Innovations*, and *Future of musical recordings*. We use *italics* to quote the interviewees throughout the result section. It should be noted that the original quotes in French are available in endnotes.

ID	Years of experience	Residence	Musical genres	Producer training	Career	Teaching position
CS1	36	North America	Classical & contemporary	Formal	Worked as staff for a major label (17 years)	Yes
PI2	33	Europe	Primarily pop-rock	On the job	Independent	Yes
CI3	34	Europe	Classical & contemporary	Formal	Indepedent, occasionally works for radio station	Yes
CS4	35	Europe	Classical & contemporary	Formal	Staff for a radio station	Yes
CS5	20 +	North America	Classical & contemporary	On the job	Worked as staff for a major label (10 years)	No
PI6	25 +	North America	Underground scene, pop-rock, jass & classical	Self-taught	Independent	Yes

Table 5.1 Background, career and culture information for each participant.

5.3 Results

5.3.1 Recording approach

5.3.1.1 The art of recording music

All six producers detailed their own approach to recording music. At the beginning of the interview, they all described their role as an interface between music and sound, *to ensure that the music and the sound function as a whole*[3] (PI2). They discussed the fact that there is no absolute truth in recording, while recording aesthetics follow some tendencies, e.g. PI2 reported that musicians and listeners currently appreciate the authenticity of sounds (meaning close to their acoustic and natural sound) in reaction to the overuse of effects and distortions in the 1980s: *we come back to* [...] *design sounds by mixing two of them, but not by working artificially*[4] [with effects].

There are no formal rules however, and all producers agreed on the importance of seeking emotion rather than technicality, the latter referring both to recording techniques as well as performance virtuosity. In CI3's point of view, too many albums are *sterile*, while recorded music should be *extroverted*. PI6 explained that we need even more energy on a recording than in a concert situation, *because I know in the studio if the performance is feeling like 90% it will come off the tape as 75%*. Regarding performance details, CS5 reported that it is useless to fight with details but always important to make sure the global result is convincing: *you push a little bit and you see resistance and you have to decide, it's a battle that I don't need to fight*. In this view, PI2 aims at producing recordings that are *relevant*: *in an album, I want there to be things that come to reach you*[5]. However, producers must sometimes deal with musicians who focus mainly on technical results (CI3) or composers who might be more sensitive to what is written than what is said through interpretation (CS4). Finally, CS1 pointed out that there are many possible ways of enjoy-

[3] *faire en sorte que justement la musique et le son ne fassent qu'un* (PI2)

[4] *on revient à* [...] *fabriquer des sons en en mélangeant deux, mais pas en travaillant artificiellement* (PI2)

[5] *Je veux que dans un album, il y ait des choses qui viennent te chercher* (PI2)

ing the performance of a piece of music: *the most technically precise* [...], *the most deeply emotional* [...] *or the most intellectually controlled.*

5.3.1.2 Comparison of recording aesthetics among musical genres

Five producers (all except CI3) evoked different aesthetics to record music depending on musical genres. CS5, who sometimes works on pop projects involving written classical music, explained how pop recording sessions differ from classical music sessions in terms of the type of instruments (e.g. electric guitar, drum set), the use of click track (metronome) and overdubbing, and the recording of different instruments in separate booths. CS1 and CS4 detailed the *Tonmeister concept* as a method developed for classical and contemporary recordings: the Tonmeister's main mission is to come as close as possible to *how we perceive music, listen to* [music] *in a natural environment of a concert hall* (CS1). CS1 explained that studio professionals could not fake it in classical music recording because the *Tonmeister concept* relies on objective criteria, such as acoustic homogeneity and relative sound levels amongst instruments: all instruments should sound like they were played in the same hall and at a level corresponding to their respective natural sound level. She mentioned that following this concept, *you can adjust the means that you use to make it like a beautiful stereo recording with two microphones, or a main recording with* [a] *few edits*. PI2, who mainly works for pop-rock productions, expressed reservations about the possibility of making a recording that sounds like a concert situation. He believes that even for classical music, it would be more interesting to create a new sonic dimension.

PI6, who has experience with different musical genres, described how he uses the studio equipment and acoustics as a musical instrument. He claimed that sound and techniques are specific to each genre. In this view, record producers must know their limits so that they can decide what genre they can or cannot produce. To illustrate his statement, he gave examples of his own unsuccessful attempts to record classical music without being an expert at reading scores, or to record a pop singer without using the typical "Auto-Tune" effect. Furthermore, PI6 considers jazz as the intersection between classical and pop recordings in term of techniques and workflow. He mentioned that time management in sessions depends on the type of music: for written music (classical, film scoring) there is an

established list of what needs to be recorded, while for non-written music, sessions can last all night without a pre-determined schedule. He also brought up that communication with the artists depends on the culture of the musical genre: *amongst classical musicians or jazz musicians*, [...] *a little more diplomacy is needed* than in pop where musicians expect the producer to bring his/her own musical ideas.

5.3.1.3 Studio challenges and producers' involvment

All six producers detailed the challenges of recording sessions for performers, first of all because *playing music is not just something nice to do, it's something that requires concentration and skills and a lot of preparation* (CS1). Compared to a concert situation where *there is an urgency "to tell" the music to the audience*[6] (CS4), in the studio it is possible to perform the same musical composition many times so as to obtain the best result, which requires the musicians to perform at their best level for many hours without the physical presence of an audience. PI6 even mentioned the possibility of bringing some fans in the studio to help musicians perform accordingly. According to PI2, *the work in studio* [...] *generates unusual situations for human interactions because at the same time there are the instinctive and immediate sides* [of performance], *while we are working for History*[7]. Recording aims to construct a polished artwork in a long-term perspective for multiple uses in different listening environments and for posterity. Interviewees detailed how recording sessions challenge not only the performers, but also the record producer, whose role includes: keeping performers motivated throughout the sessions (CS4); working without breaks and listening critically for many hours in a row (PI6); anticipating postproduction needs and ensuring there is enough valuable material to edit (CI3 and CS5).

In terms of producers' artistic involvement, CS1, CI3 and CS4 (all three producers in classical and contemporary music) stated that they do not want to impose their own aesthetics and vision on the musicians. CS4 does not believe in teaching musicians how to play, and CI3 raised the risk of bringing preconceived ideas to a project. PI2 reported

[6] *il y a l'urgence à dire au public la musique* (CS4)

[7] *le travail en studio*, [...] *met en relation les hommes d'une façon assez particulière, parce qu'à la fois il y a le côté instinctif, l'immédiateté, et on est en train de travailler pour l'histoire.* (PI2)

that he takes over the project once he is clear on its goals and characteristics. PI6 and CS5 see the record producer as a partner with musicians working together to achieve the same goal. In this view, PI6 stated that a recorded song should belong to all actors involved in the production, since the boundaries between the different roles in the studio often blur. But people typically get credits for a specific task (e.g. composition, performing, mixing), while they often are involved in more than one.

5.3.1.4 Comparison with other practices

All six interviewees mentioned explicit links between their recording approach and other practices in the artistic domain as well as with other professions. To highlight how criticizing music performance can be objective, CS1 chose an analogy in the visual domain: she compared a bad performance with a simplistic face drawing and a mastered performance with a Leonardo De Vinci painting of the Madonna. PI2 referred to the album cover of *Dark Side of The Moon* by Pink Floyd to explain that an artwork can be symbolized as a prism: an interface between the white light – reality – and the seven colors that constitutes the white light – the truth.

PI2 also compared his role as a producer to that of a photographer that aims at capturing the best-meaning instants and then bring them together. To illustrate the importance of achieving a good technical result in performance, CS4 made an analogy to a cleaner whose first mission is to make sure the result is clean. PI6 pointed out resemblances with a servant who constantly ensures that the artists feel comfortable to play music. CS5 likened his profession to the captain of a ship, while CI3 chose a fireman, both trying to express their responsibilities and the difficulties of working with artists in chaotic and urgent situations. CI3 also compared the record producer's role to that of a mid-wife who helps artists give birth to their best possible performance.

Finally, PI2 mentioned that technological evolutions always lead to a loss. He illustrated his statement by comparing the recent changes of the organization of the recording industry to the introduction of sound in films. Silent films required accurate filming and acting for

the viewers to understand the story while with the introduction of sound in films, filming and acting standards decreased.

5.3.2 Synthesis

In keeping with the literature, results show that there is no single approach to recording; studio professionals can follow different approaches depending on artistic intentions and musical genres. The *Tonmeister concept* is defined as an attempt to elicit listeners' emotions by recreating the musical discourse conveyed by performers in the concert (which differs significantly from placing microphones at a listener's position in the concert hall). It is also possible to generate emotions by creating a new sonic dimension, a concept that refers to Culshaw's *Creating virtual worlds* to enhance the composition (Patmore & Clarke, 2007), but also to *Using the studio as a musical instrument* (Moorefield, 2005; Théberge, 1997). Recording techniques are specific to musical genres and to the nature of the collaboration with the artists: in classical music, record producers base most of their decisions on the artists' musical ideas, while in pop-rock, there is more collaboration between the record producer and the artists regarding artistic decisions. Recording sessions present challenges for both the artists and studio professionals, which in turn generate unusual situations for human relationships. Interviewed record producers compared their profession to photographers, cleaners, servants, captains of a ship, firemen and mid-wives to illustrate three aspects of their mission: making artistic decisions, developing intimate relationships with the musicians and taking responsibility for the project.

5.3.3 Recording industry

5.3.3.1 Business changes

All six producers commented on the decline of major record labels and its consequences on the recording industry, either in positive or negative ways. They all expressed concerns on the lack of time allocated to recording productions due to very low budgets in the

current situation. To optimize time during recording sessions, PI2 and PI6 opt to produce recordings in their own studios so they can get around time constraints and are able to spend the time needed to complete projects with the best possible quality. CI3 prepares his recording sessions differently than he did in the past: he now meets the artists in person before the first session in order to define the production flow and to create a relaxed work environment during recording sessions. Similarly, CS5 explained, *if you are somebody like me who cares about the quality of what you are doing, you end up investing your own time to make these recordings good, even if you are not really being paid enough for all the time you are spending.* He now gets hired to do more projects than in the past, but he also gets paid less. He further indicated that low budgets force record producers to make compromises not only in time commitment but also in the choice of equipment, venue, and co-workers.

PI2 reported that over the course of his career starting in 1978, he observed fewer and fewer big pop sessions with string and/or horn sections. Nevertheless, CS1, CS4 and CS5 described a resurgence of classical recordings in the 1980s: after the introduction of the CD, there was a need to create new digital versions of the repertoire, as well as opportunities to remaster old analog recordings for digital formats. CS1 mentioned that at the time, classical projects were mainly produced by major labels. CS1 and CS5, who both worked as staff producers for major labels and are now free-lancers, explained that major labels in classical music went through important transformations around the year 2000. Since then, recording projects are outsourced in terms of stakeholders, equipment and venues, while in the past major labels gave staff producers unlimited access to their recording studios and customized equipment. As a direct consequence, CS5 highlighted that record labels no longer have a sound or an artistic identity. He described the current situation as disorganized and chaotic, but very interesting. Indeed, both CS1 and CS5 enjoy the opportunity of collaborating with different artists who are not signed to their label on a wider variety of projects. They can offer their skills and experience to beginners or non-established artists or ensembles. Reciprocally, PI6 who has always worked as an independent producer in the underground scene explained, *the artists are kind of filtering more down to more independent people: I've been able to work with some major artists that I don't think in the past would have been able to choose who they want to work with.* [...] *We* [the independent people] *have more work now that the big machine is slowing down.*"

5.3.3.2 Roles and hierarchy

Four producers (CS1, PI2, CS5 and PI6) mentioned the impact of the new economic context on roles and hierarchy in the collaborative process of musical recordings. PI2 and CS5 reported that budgets for current recording projects are too low to hire as many professionals as before. PI2 detailed the roles of different stakeholders for the production of a musical recording in the late 70s: a financial producer who paid for the project, a record producer who directed the sessions artistically, an executive producer who interfaced between the financial producer and the record producer, a sound engineer responsible for the sound, and an assistant to help with anything. In addition to musicians and composers, there was also an arranger and a transcriber to copy the scores. In this hierarchy, roles were very well defined, e.g. sound engineers did not interfere with artistic decisions. *And today there is one guy in studio, that's me! Meaning that I make coffee, I make sandwiches, I arrange, I produce, I make the sound, I do the copies if needed, I place microphones, I mix...* [8] (PI2). In PI2's view, the reduction of the team to one professional has a direct impact on the quality since *the more pairs of ear, the mores chances you have to do constructive work*[9]. CS5 reported that because of budget constraints, he no longer delegates the editing and he will soon do the mixing himself. Consequently, young professionals are deprived of opportunities to demonstrate their competences in order to integrate into the business. He concluded that it is a difficult time for young producers, even for talented and highly motivated ones.

CS1 pointed out further consequences of the client relationship with musicians: in the absence of an intermediary (record company) between producers and musicians during the production process, the producer has to negotiate directly with the musicians in terms of the limits of editing (also mentioned by CS5), and to make decisions when musicians disagree amongst ensemble members. Because musicians tend to manage their recording project themselves, some of them actually play the role of sound engineers, and oftentimes there is no external record producer to run the sessions. PI6 has always worked on independent

[8] *Et aujourd'hui il y a un mec en studio, c'est moi ! C'est à dire que moi je fais les cafés, je fais les sandwichs, je fais des arrangements, je réalise, je fais le son, je fais des copies s'il le faut, je place les micros, je mixe...* (PI2)

[9] *Plus il y a de paires d'oreilles, plus tu as des chances de faire un travail constructif.* (PI2)

projects financed by musicians, even before the downfall of the major labels. According to him, if one of the actors of the collaborative process raises a problem, it means something is wrong and the problem should be addressed. He explained that roles in independent productions have never been well defined: oftentimes he is only credited as sound engineer although he also handles the responsibilities of record producer. He also reported that some of his former clients now hire him only as an extra set of ears in postproduction. However, he argued against the *DIY* concept (Do It Yourself) and emphasized the importance of having a minimum of three people, i.e. *an artist as a band or whatever*, *but you really need two people in the control room,* [...] *one dedicated to putting out technical fires and the other listening* (PI6).

5.3.3.3 Technical innovations

Five producers (all except CI3) commented on the technical advances in digital technologies in the last two decades. On several occasions since the early 80s, PI6 had the opportunity to compare the quality of analog and digital equipment and in the last few years, he observed almost equivalent sound quality between the best digital and the best analog equipment. CS1, CS4 and CS5 focused on the amazing improvements in digital tools for editing and correcting, such as the possibility to change the tempo of a take. Moreover, PI6 mentioned the possibility of doing revisions at any point in time, which was not possible with analog equipment. CS1 and CS5 explained that musicians became aware of these possibilities and that they now have higher expectations in terms of postproduction. However, all interviewees noted that producers do not use the full capabilities of these tools due to time constraints: *the irony is that we have all these tools so we can spend all this time to make these recordings better and better, and it is great, but nobody can pay for all this time* (CS5).

PI2, CS5 and PI6 discussed positive aspects of technological improvements, specifically the plummeting cost of digital equipment and the fact that it can run on a laptop. CS5 explained that affordable equipment allows for the democratization of access to the business: major labels that own equipment no longer control the industry. Similarly, producers no longer need to rent professional studios for postproduction and can now work anywhere. But at the same time, PI2 expressed nostalgia for the social interaction in traditional

studios where producers would ask their colleagues to comment on their recordings and where hallway discussions would often result in new artistic collaborations.

5.3.3.4 Future of musical recordings

Five record producers (all except CS5) reflected upon the future of the recording industry. According to CS4, the future of musical recordings is *that we are going more towards live* [recordings] *than hyper-polished studio work*[10], which would reduce costs of production and take advantage of the development of video streaming. This change would imply adaptations of record producers' practices, as they would need to work with musicians in rehearsals to optimize the artistic result in live concerts. CS1 suggested that studio professionals' roles in the future might be reduced to handling technical aspects for Internet broadcasting. However, CI3 was more positive and reported working more and more for audio-only recordings that are released online in High-Resolution formats. CI3 and CS4 insisted that there would always be a need for studio work, because artists will continue to record in order to promote their music. CI3 and PI6 who have always worked as independent producers specified that the role of the producer during recording sessions would remain similar to what it was in the traditional business model of the recording industry. Specifically, PI6 reported that colleagues who survived the decline of the recording industry readjusted and *are doing fine* businesswise.

PI2 commented on the trend to produce individual tracks instead of full albums: *the music won't be conceived by album, it will be conceived title by title.* [...] *The artist who had things to say but who was forced to please the audience to be able to say to them, today s/he won't be able to do this, meaning that on the same album s/he won't put one or two very personal titles and two or three commercial power tracks*, [...] *s/he will be forced to sell title by title*[11]. With albums, artists combined economically viable titles with

[10] *on va beaucoup plus vers du live que vers le travail en studio hyper peaufiné* (CF4)

[11] *la musique ne va plus se concevoir en album, elle va se concevoir titre par titre.* [...] *L'artiste qui avait des choses à dire mais qui était obligé de plaire au public pour pouvoir les dire, aujourd'hui il ne pourra plus faire ça, c'est à dire que sur le même album il ne pourra pas mettre un ou deux titres très personnels et deux ou trois locomotives commerciales*, [...] *il sera obligé de vendre, titre par titre.* (PI2)

more personal productions. In the long run, music fans often preferred the more personal productions that they may not have bought as individual tracks at first.

None of the interviewees had solutions for viable business models to cope with Internet mass pirating. CS4 mentioned that we could not predict whether listeners will be willing to pay for recorded music in the future. He suggested that paying Internet platforms offering video streaming could play one of the roles of record labels which consist in selecting artists and thus helping music lovers discover new artists they may like. PI2 imagined that in the future, the new generation of studio professional would come up with multi-purpose structures combining social interactions of traditional studios with modern digital technologies.

5.3.3.5 Synthesis

In keeping with the literature, all interviewees reported lower budgets and fewer resources to produce musical recordings in the current context of the recording industry. As a direct consequence, they need to spend more time preparing for studio sessions with fewer staff in order to optimize tight schedules and specific recording environments for each project. Budget cuts also decrease opportunities for young producers to come into the business. At the same time, the decline of the traditional business model of record companies allows artists and studio professionals to collaborate directly with more artistic freedom. Furthermore, digital technologies enable studio professionals to work from anywhere and at a cheaper cost than in the analog era. According to the record producers interviewed, the future will remain in live recording and Internet broadcasting.

5.4 Discussion

Our investigation of experienced record producers' practices indicates that recent technological advances have not influenced the main concepts of recording aesthetics. Interviewees still rely on two recording approaches, namely the *Tonmeister concept* and *Using the stu-*

dio as a musical instrument. Their verbal descriptions detailed the same theoretical goals of recordings that we found in the literature (Section 2.2 on page 14): the Tonmeister concept refers to Edidin's (1999) *Composite recordings of compositions* and Patmore and Clark' s (2007) *Creating virtual worlds*; *Using the studio as a musical instrument* refers to Edidin's *Recording artifacts* and the work of Moorefield (2005) and Théberge (1997). None of the interviewees mentioned the *Attempting realism* approach (or to Edidin's *Recording as performance*) that appeared in the literature as a primitive goal of musical recording. Somehow, the *Tonmeister concept*, with the aim of eliciting the concert emotion through recording, better serves artworks than *Attempting realism*, which appears to be a misleading fantasy (shared by many musicians and laypeople) that recording can be transparent.

From the analysis of interviews, consensual views emerged about the impact of recent changes on career path: 1) there is still work for studio professionals but with tighter budgets and outsourced facilities; 2) digital technologies enable endless possibilities to work on musical recordings from anywhere and at a reasonable cost for independent production. Thus, these new digital technologies partly compensate for the lack of resources traditionally provided by record companies. But it should be noted that digital tools do not provide the good acoustic halls, time, and professionals' competencies needed to produce successful recordings. To sum up, we identified an interesting paradox: producers now have access to affordable and more efficient tools than in the traditional business model but they do not have enough time allocated on the job to benefit fully from these tools.

Although there is no doubt that there will still be a need for musical recordings in the future, the production quality of the production is challenged by budget and time constraints. Record producers adjust to these business changes by working alone, while acknowledging that less collaboration with other studio professionals compromises the quality control of the production. The challenge of time also has implications on musicians' preparation for recordings. Because they have to manage and promote their projects themselves, artists do not have enough time left for creation and rehearsal. More and more, musicians count on the editing possibilities of digital tools to improve their performance in postproduction. In the meantime, they do not have the budget for endless postproduction corrections. Therefore, the lack of preparation combined with tight schedule during the production and low budgets for postproduction strongly limit producers' and artists' expectations.

The producers interviewed have a reputation that has enabled them to remain successful in the music business through the economic crisis. However, it should be noted that five out of the six participants hold teaching positions in addition to working as producers. For some of them, teaching in institutions provides advantages in addition to regular incomes, such as access to well-equipped studios and concert halls at nominal fees. The only participant who does not teach reported making less money now than in the past while working more. He actually expressed reservations regarding opportunities for young professionals to succeed in the recording business.

Reflecting on the near future, the record producers foresee recording productions as live audio-video recordings for the Web/HDTV instead of audio-only well-refined studio creations. This view is in agreement with the success of YouTube that "dominates digital music activity in Europe with nearly one-third of all Internet users watching music videos online" (IFPI, 2010). However, the development of selective platforms diffusing high-resolution recordings from live or studio work, with or without video, will depend on viewers' willingness to pay, and it is unclear at the moment how to foster that willingness.

Authors of the 2010 International Federation of the Phonographic Industry (IFPI) report mentioned the development of legislations that aim to dissuade people from pirating through the Internet (already established in France, South Korea, Taiwan, UK and New Zealand). However, no research demonstrated yet that such legislation is going to be efficient. As an alternative, the amount of education campaigns increases in order to sensitize youth and parents regarding the law of unauthorized file sharing. But, "results have shown that awareness of law alone, without a perception of risk, has not succeeded in changing behavior in a sustainable way" (IFPI, 2010). Some websites such as Artistshare.com or Akamusic.com allow fans to fundraise musical projects of the artists they want to support. Helman (2010) questioned the relevance of copyrights in the current context of the recording industry. He and Bekir et al. (2011) demonstrated the viability of a model to facilitate "voluntary payments by users directly to recording artists via digital services," based on "the most ancient way for artists to collect money: passing the hat." Regner & Barria (2009) reported the success of a voluntary payment model designed by the label Magnitude that selects artists through a strict process to guarantee quality. The average payment per album for this label is higher than the recommended price of $8 suggested on

the web site. The "pay-what-you-think-it-is-worth" online strategy (Bekir et al., 2011) has been successfully illustrated in 2007 by Radiohead's self-release of the album In Rainbows at the end of their contract with the major company EMI. However, a band that sold 30 million items of seven albums, six of them produced by a record major in the traditional business model, may not be sufficient to prove the success of this strategy. Furthermore, this strategy does not bring solutions to increase budgets for new artists to produce and promote their music.

Finally, we would like to propose that the concert industry could play an important role in the future of recordings. According to David (2010), the income split between artist and promoter in performance has always been more equal than the one between artist and label in recordings. The concert industry does not suffer from illegal file sharing, and it needs good recordings to promote the music and motivate people to go to live performance. Therefore, we could imagine a new business model where live companies pay for video and audio recordings in order to use them to promote concerts. A concert industry business model could be combined with the "pay-what-you-think-it-is-worth" strategy, paid online audio-video streaming, and the sales of physical recording media at the end of concerts.

5.5 Conclusion

In the new paradigm of the recording industry, musicians tend to finance, manage and promote their recording projects themselves, without necessarily hiring studio professionals from the initial stage of the production. And when hired by artists, a single studio professional often handles three jobs at once (Neuenfeldt, 2007). Furthermore, the client relationship between studio professionals and artists, without record companies as intermediary during the production process, hinders the traditional collaborative process among experts in the field.

Recording technology has strongly transformed the way artists perform and compose music; in the meantime it is our dominant mode of music reception (Gracyk, 1997). Before the economic crisis of the recording industry, Glenn Gould even predicted that "public

concert as we know it today would no longer exist a century hence, that its functions would have been entirely taken over by electronic media" (Théberge, 1986). But Glenn Gould could not imagine the current paradigm of musical recordings, with the amount of available music on the Internet exponentially increasing every day, without any efficient system of indexing or quality control. While music lovers still attend traditional concerts, we can speculate that they will struggle more and more to discover new composers and performers via recordings they may like. Furthermore, our findings suggest that at a larger scale, the new economic paradigm of the recording industry could have a negative impact on the quality of recordings. In a near future, music lovers may have a hard time finding new music that they like and the level of quality may not meet their standards.

Our investigation is part of a wider research project that aims at documenting in depth the tacit knowledge and competencies needed to produce musical recordings. We expect that this documentation will allow us a greater understanding of the components necessary for the production of successful recordings, and how these components can be incorporated according to the new constraints of the recording industry. Specifically, further investigations concern studio preparation and professionals' competences to get the best artistic result.

To date, our research is centered on music production in an European and North American context. However, both Internet and digital technologies extend the access of recorded music, and while they are responsible for the downfall of physical media (i.e. CD), they also give rise to new musical production in emergent countries. "Although primarily of western origin and innovations, technologies of music production and distribution have come into their own in the non-western world, where high-tech sounds saturate many musical cultures today" (Greene, 2005). Therefore, future research will also extend our investigation of studio practices in different cultures and economic contexts.

5.6 Acknowledgments

We would like to warmly thank the six world-renowned record producers who accepted to take some time to share their knowledge with us. We would also like to thank Terri Hron for her proofreading. The first author is funded by the Fonds Québécois pour la Recherche sur la Société et la Culture (FQRSC) and the Centre for Interdisciplinary Research on Music Media and Technology (CIRMMT).

Chapter 6

Record proucers' best practices for artistic direction - from light coaching to deeper collaboration with musicians

The following chapter has been adapted from:

Pras, A., Cance, C., & Guastavino, C. Record producers' best practices for artistic direction - From light coaching to deeper collaboration with musicians. *Science, Technology & Human Values*. Submitted.

A preliminary version of the results was published in:

Pras, A. & Guastavino, C. (2011). Diriger l'écoute afin d'enregistrer la meilleure performance possible. In *Proceedings of Tracking the Creative Process in Music*[1], 2011, Lille, France.

The interview guide that was designed for this study is available in Appendix C.

6.1 Introduction

6.1.1 Purpose and context

The artistic process of a musical recording includes the capture of several takes of the same musical work, and the editing of the best takes to reconstruct the musical work in postproduction. During recording sessions, musicians have to repeat the same music for long hours without an audience (Chanan, 1995). In order to obtain satisfying takes, record producers interact with musicians to help them perform at their best level and persist in being creative in spite of the challenges of studio conditions. This chapter aims to document the best practices for artistic direction during recording sessions and relies on interviews with six world-renowned record producers.

This study is part of a multi-method research project investigating traditional and current studio practices for musical recordings. The recording industry has gone through major upheavals in the past twenty years. Digital technologies and Internet file sharing led to the delocalization of recording studios (Théberge, 2004) and to the decline of the traditional business model of record companies (Day, 2011). Consequently, musicians now hire studio professionals directly without record companies as intermediaries. In this new economic organization, studio professionals often handle three jobs at once, namely those

[1]The international conference TCPM 2011 assembled for the first time a considerable number of researchers interested in the study of the creative processes involved in the production of music/sound, to take the first steps towards a comparative assessment of the different methodologies developed over the last thirty years in research areas which interact with each other all too rarely. The conference served to open up broader issues of artistic creativity as it is approached in fields outside of musicology: history, psychology, cognitive science, sociology, anthropology, genetic criticism, etc.

of record producer, sound engineer and studio assistant (Neuenfeldt, 2007). In traditional recording studios, studio professionals' Knowledge, Skills and Competences (KSC) used to be transferred through an apprenticeship model. With the emergence of individual home studios, studio practices are no longer taught on the job and formal training through documentation and master classes is needed (Porcello, 2004) to preserve these KSC and reinvent the profession of record producer in the new landscape of music (Burgess, 2008).

6.1.2 Comparison with other practices

Our investigation deals with the recent research field of artistic creation studies. In musicology, Donin & Theureau (2007) proposed a new methodology to document the process of musical composition, using a qualitative approach to recreate the compositional situation through document analysis (manuscript scores, screenshots of various stages of the computer work, e-mail exchanges with performers). The creative process of music production differs significantly in that record producers are typically involved in later stages of the creative process. Hennion (1981; 1989) introduced the concept of producers as "intermediaries between production and consumption", i.e. between artists and their future audience. Jyrämä & Äyväri (2007) extended this concept to the roles of mediators in knowledge creation. Building upon Bourdieu's definition of cultural intermediaries (1984) as "a group of workers who play an active role in promoting consumption through attaching particular meanings to products and services", they described the main tasks of cultural intermediaries, specifically "to create meaning"; "to mediate between differing fields or worlds"; and "to mediate between national cultures". Jyrämä (2008) further developed a model adapted from Ahola et al. (2004) and Jyrämä and Ahola (2005) that illustrates different levels of mediating roles in management of project production, namely 1) Support mediator who gives credibility and means; 2) Team mediator who is involved in an integral part of the discussions for the purpose and activities; 3) Managing mediator who is the driving force, essential in bringing different parties together; and 4) Producer mediator, of crucial importance because of his/her expertise. Although this literature on mediating roles provides interesting insights on the concept of intermediary between production and consumption in management, the methodology used to collect and analyze the data in order to design models illustrating those mediating roles was not fully described in the articles, making

it difficult to decide whether of not they would be applicable to our context. Therefore, in the present chapter, we develop a model grounded in verbal data through an inductive analysis of verbal resources and discourse processes.

Musical recording can also be compared with filmmaking. Indeed in both practices, "the intended version of *reality* is pieced together through a process of repeated takes and editing" (Patmore & Clarke, 2007). A parallel can be drawn between the roles of film director and record producer, both playing an intermediary role between performers (musicians/actors) and a future audience, and both leading an artistic team and a technical team. There is little research to document the film director profession but the role of actor directors in play productions has been thoroughly investigated by Proust (2006)[2]. She interviewed world-renowned actor directors and observed the complete process of several play productions, from the choice of actors through different phases of rehearsals, to the final adjustments after the first representations. She detailed how, during rehearsals, directors rely on their feelings while listening and looking at the actors on stage so as to change or fix actors' propositions. This practice strongly refers to Hennion's definition of an "intermediary" between performers and future audience. Proust also analyzed the ways directors interact with actors to guide them throughout the production process. However, it should be noted that the two professions present a major difference: while actor directors hire actors, record producers are now hired by musicians. Record producers are then expected to enhance artistic motivation and creativity more than to express their own artistic personality.

6.1.3 Tacit knowledge, skills and competences

In the literature of systematic musicology and social sciences, record producers are described as music critics and amateur psychologists (Zager, 2006), "multi-skilled" professionals (Neuenfeldt, 2007), "without well-defined skills but whose flair and impressions are the key to success" (Hennion, 1989). Moreover in a previous study, we found that record producers compare themselves to photographers who aim to capture the most meaningful moments and then bring them together. They also identify themselves with "cleaners,

[2]In her work, Proust explained that acting direction directly derives from film direction.

servants, captains of a ship, firemen and midwives" to illustrate diverse aspects of their mission (Chapter 5).

Based on previous research showing how diverse and unclear record producers' KSC are, we argue that these KSC are mainly "tacit," a concept first introduced by Polanyi (1958; 1983), referring to knowledge we cannot learn from reading a manual, as opposed to "explicit" knowledge that can be expressed in words. Nonaka & Takeuchi (2007) mentioned that tacit knowledge is highly individual and often rooted in action, and that tacit skills are acquired through observation, imitation and practice. Hence tacit knowledge and skills are difficult to communicate to others. Cowan et al. (2000) and Tsoukas (2003) demonstrated that tacit knowledge could not always be formalized into explicit knowledge. Tsoukas concluded that tacit knowledge can only be approached by discussions among practitioners and reflection upon how they perform tasks. Furthermore, Winterton et al. (2006) explained how the concept of knowledge in professional practices could not be separated from the concepts of skills and competences. In this view, we consider record producer's expertise as an ensemble of KSC.

6.1.4 Previous studies

This chapter builds upon an investigation of the role of studio professionals (music producer and sound engineer) using an open-ended questionnaire administered to young but already experienced musicians and sound engineers (Chapter 3). Respondents' perception of these roles appeared to be similar to the description in the literature, which suggests that studio professionals' roles have not yet been affected by the recent changes in the recording industry. However, this conclusion called for an investigation of the perspective of experienced studio professionals of their own role. While the profession of sound engineer (how to get the best sound) has been addressed in "sound studies" (Pinch & Bijsterveld, 2004) and largely documented in manuals, handbooks and studio reports, the profession of record producer (how to get the best overall result) has received scant attention, with the exception of an ethnographic study of the recording studio in French popular music by Hennion (Hennion, 1981). Therefore, we chose to focus on the role of record producers and specifically on the artistic aspect of their role (how to achieve the best artistic result).

To do so, we conducted interviews with six world-renowned and active record producers with more than twenty years of studio experience. We devided the analysis of these interviews into two main sections: 1) the recording approach and career path of these record producers and 2) the knowledge, skills and competences (KSC) required of record producers to achieve the best artistic result in recording sessions. The analysis of the first section has been reported in Chapter 5: in response to changes in the economics of the recording industry, all interviewees adjusted to the new situation; although they deplored budget cuts, the reduction of resources and decreased collaboration amongst studio professionals, their aesthetic approach and work methods were not yet affected by the new organization of the recording industry. Therefore, we can consider our documentation of studio practices (second section reported in this chapter) accurate in the current recording context.

6.1.5 Objectives

This study aims to understand how record producers interact with musicians in the making of successful recordings. To define successful recordings, we refer to the definition of successful movies by Delmestri et al. (2005): either the ones that receive good reviews from experts (festivals, specialized magazines) or have box office successes. Hence we consider musical recordings that received positive reviews and/or made musicians famous as successful. We recruited record producers with outstanding portfolios of prize-winning musical recordings with internationally renowned artists in their musical genre.

In order to highlight the practices of record producers in discourse, we first investigate how record producers describe their mission, their methods of production and the contribution of their communication skills on the artistic result of musical recordings. We then compare our findings with the expectations of young musicians and sound engineers while working with a record producer (Chapter 3). We also discuss Hennion's concept of "intermediary between production and consumption" (1989) and Jyräma's model of mediating roles (2008) as it applies to our context. Finally we draw a parallel between the role of record producers and actor directors by contrasting our findings with the research of Proust (2006).

6.2 Method

6.2.1 Interdisciplinary approach to verbal data analysis

Individuals share their experiences, practices and knowledge in discourse. Therefore, to investigate how record producers define their mission, methods of production and contribution in the artistic result of recordings, we chose a qualitative methodology based on the content and discourse analysis of six semi-structured interviews. Our interdisciplinary approach is grounded in both social sciences and linguistics.

Developed in social sciences, content analysis as "a research technique for the objective, systematic-quantitative description of the manifest content of communication" (Berelson, 1952, p. 18) allows researchers to identify (and generally quantify) the main themes and topics present in a discourse. Therefore it focuses on **what** is being said in discourse. However, research in linguistics and especially in discourse analysis has shown that analyzing **how** it is being said is also of a great importance (Benveniste, 1966).

Cognitive linguistics studies the relationships between language, discourse, cognition and practice by analyzing linguistic resources and their organization in discourse (Rastier, 1991; Croft, 2009). These verbal resources and discourse processes contribute to building and structuring one's experience and knowledge of the world (Dubois, 2009). For instance, linguistic analysis of discourse (by analyzing linguistic markers, for example, the use of personal pronouns) allows researchers to identify discourses referring to individual experience and contrast them with discourses referring to collective and consensual knowledge (Dubois, 2008).

This multidisciplinary approach has been the basis for earlier investigations concerning different types of discourses on musical sounds (piano or voice quality, (Bensa et al., 2005; Morange et al., 2010) and non-musical sounds (such as urban soundscapes, Guastavino, 2006), as well as on other sensory modalities such as visual spaces (Cance et al., 2009) or more holistic concepts such as comfort (Delepaut, 2007; Dorey & Guastavino, 2011) or expertise (Langlois et al., 2011). This approach has also yielded insights on new practices

in computer music, specifically in their evolution of the notion of instrumentality Cance et al. (2009). With regard to studio practices, Porcello (2004) investigated the vocabulary used to communicate among sound engineers and with musicians. To our knowledge, this kind of work has not yet been done in documenting artistic direction. Hence, this chapter aims to test the efficiency of this interdisciplinary approach in analyzing record producers' description of their practices.

6.2.2 Participants

We recruited six record producers from the first author's[3] professional contacts in the recording industry, representing a wide range of musical genres, training and career paths (as detailed in Table. 6.1, a more complete table is available in Appendix D). They all have outstanding portfolios and at least twenty years of experience working in studio and are still active record producers. Four interviewees record classical and contemporary music. The other two record a wide range of musical genres ranging from pop rock to jazz. Three interviewees are self-taught or learned on the job through an apprenticeship model, while the other three received formal Tonmeister training, a method to produce musical recording inspired by the composer Arnold Schoënberg ((Borwick, 1973), Chapter 5). Five out of the six interviewees can also engineer recording sessions. The same five producers teach record production in academic institutions. Three interviews were conducted in English, the other three in French. We assigned an ID[4] to interviewees according to the main musical genre and the language of the interview: **C** for classical and contemporary music, **P** for pop-rock and other genres, **E** for interviewed in English, **F** for interviewed in French[5].

[3]The first author has worked as a record producer for 12 years.

[4]In Chapter 5 that reports the other part of these interviews, we use a different letter coding for the purpose of this chapter but the number in the ID remains the same.

[5]In the body of the text all the quotes from the interviews conducted in French will be translated in English while the original French quotes will be presented in footnotes.

ID	Years of experience	Musical genres	Language for the interview	Producer training	Career[6]	Also sound engineer
CS1	36	Classical and contemporary	English	Formal	Worked as staff for a major label (17 years)	Yes
PI2	33	Primarily pop-rock	French	On the job	Independent	Yes
CI3	34	Classical and contemporary	French	Formal	Indepedent, occasionally works for radio station	Yes
CS4	35	Classical and contemporary	French	Formal	Staff for a radio station	Yes
CS5	20 +	Classical and contemporary	English	On the job	Worked as staff for a major label (10 years)	No
PI6	25 +	Underground scene, pop-rock, jass and classical	English	Self-taught	Independent	Yes

Table 6.1 Background, career and culture information for each participant

6.2.3 Data Collection

We conducted semi-structured interviews between April 2009 and May 2011 in Montréal, Paris and New York. The interviews lasted about one hour and took place in the interviewee's work environment. After the first interview questions were added and rephrased. The final interview guide included eight open questions (listed in Appendix C). These questions were derived from the findings of our previous questionnaire study (Chapter 3). In that study we had identified categories and concepts emerging from the free format verbal descriptions of the role of an ideal record producer (See Figure 6.1). The three main categories were **Mission Of Artistic Direction** (24 occurrences); **Communication Skills** (20); and **Interaction With Musicians** (12). Each of these main categories included several concepts: **Mission Of Artistic Direction** included Guidance (9), Aesthetic Context (6), Criticism And Optimization (5), Extra Set Of Ears (4); **Communication Skills** included Creation Of A Good Environment (6), Trust And Honesty (6), Unite All People (5), Help Focusing (3); **Interaction With Musicians** included Involved And Creative (6) and Not Controlling (6). We concluded that musicians expect record producers to direct recording sessions artistically by providing guidance according to the Aesthetic Context, but without Controlling the musicians.

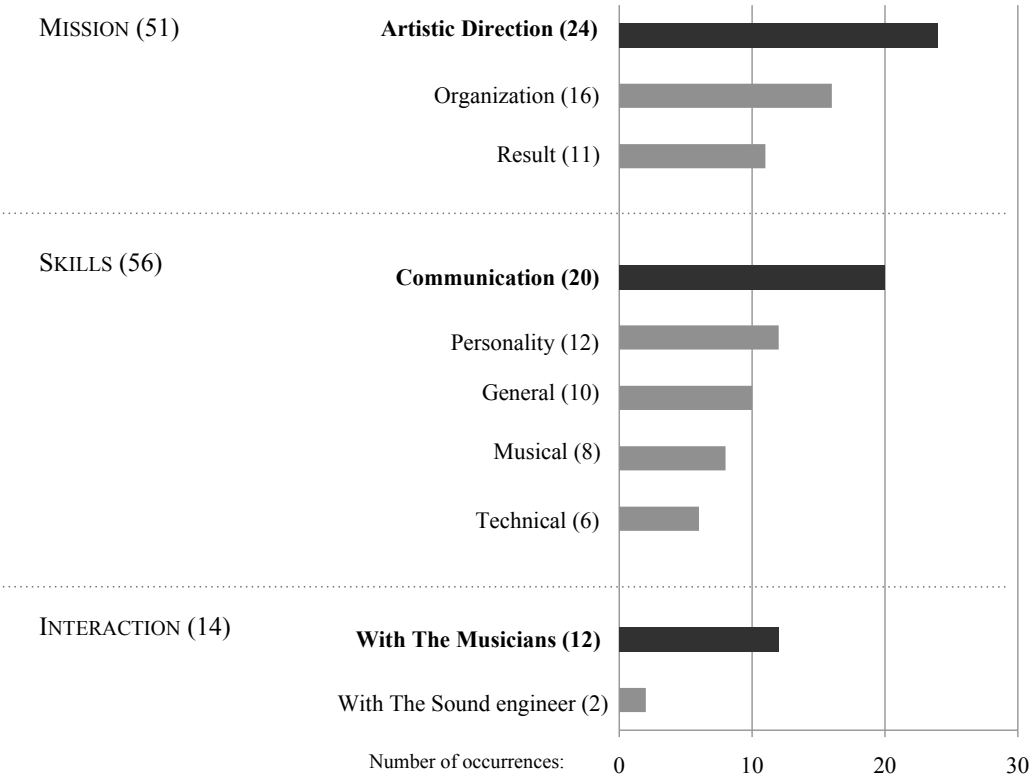

Figure 6.1 Role of an ideal producer as perceived by 16 musicians and 6 sound engineers (adapted from Chapter 3)

In this chapter, we report on the analysis of four questions related to the record producers' interaction with musicians, their mission, methods of production and contribution to the artistic result of recordings. Record producers were asked:

1. In your opinion, what is your role as a music producer in the context of recording sessions?

2. In your opinion, what make a good music producer? Specifically, what are the most important skills and qualities?

3. How would you describe your approach to achieve the best possible artistic result? Specifically, how do you run a recording session? (Time and project management). Do you use specific methods? If so, please describe them.

4. How would you describe your interaction with musicians? Specifically between takes of the same musical piece/tune. How do you handle musicians' personalities and stress?

Although the quality of a musical recording cannot be separated from sound quality, we asked record producers to focus on the artistic result of musicians' performance in the recording. Throughout the interviews, we encouraged producers to illustrate with practical examples from their experience. All interviews were audio recorded and fully transcribed.

6.2.4 Analysis

6.2.4.1 Content analysis

We first extracted all the verbal descriptions related to our research questions, i.e. record producers' interaction with musicians, their mission, methods of production and contribution in the artistic result of recordings. We then applied the constant comparison method of Grounded Theory (Glaser & Strauss, 1967) to classify the free-format verbal descriptions and iteratively reviewed this classification within and across interviews. The constant comparison method is an inductive analysis to first identify emerging concepts that are later grouped into more generic categories based on the semantic similarity among concepts. However, for the sake of argumentation, we present the more generic categories first, and then provide further detail on the concepts within each of the main categories. In the result section, we focus on the three main categories, namely **Mission Of Artistic Direction**; **Communication Skills**; and **Interaction With Musicians**. These categories had been already identified as predominant in our previous questionnaire study (Chapter 3), as illustrated in Figure 6.1.

6.2.4.2 Linguistic analysis

We relied on a linguistic analysis to strengthen and complement the outcomes of the content analysis. To do so, we systematically analyzed the phrasings that were classified into concepts and meta-categories (in the content analysis). More specifically, we examined lexicon use (nouns, verbs, adjectives) and discursive markers such as 1) personal pronouns that are indicators of how speakers position themselves in their discourse (Benveniste, 1966; Murphy, 1988) and 2) modality markers that are indicators of the status that speakers give to their discourse, e.g. their evaluation of what is being said (Vion, 2004; Chafe & Nichols, 1986; Guentchéva, 1996).

Psycholinguistic inferences can be drawn from linguistic indicators. Hence, nouns and nominal forms (both in English and French) generally refer to entities and abstract concepts, whereas verbs and verbal forms generally refer to actions, events, processes and practices. The presence or absence of personal pronouns highlights the speaker' involvement and indicates the extent to which the discourse is personal, idiosyncratic, revealing one's subjectivity (especially with first-person pronouns), or if the discourse can be considered impersonal, more abstract, with generic statements and striving for objectivity. Moreover, while a first-person singular pronoun stands for personal and individual discourse, first-person plural pronouns refer to more collective and shared concepts and practices.

In the results section, for the sake of conciseness, we illustrate the systematic linguistic analysis with a selection of quotations that best represent specific concepts.

6.3 Results

6.3.1 Record producers' levels of artistic involvement

6.3.1.1 Concept identification in the three main categories

From the content analysis combined with the constant comparative method, five concepts for the category **Mission Of Artistic Direction** emerged. Three of them were already identified in our previous study documenting the perspective of musicians and sound engineers (Chapter 3), namely Aesthetic Context, Extra Set Of Ears, and Guidance. The concept Feedback is related to the concepts of Criticism And Optimization observed earlier, and the concept Best Possible Artistic Result is strongly similar to the concept Best Artistic Result in the category **Result** observed earlier.

We also identified six concepts for the category **Interaction With Musicians**, namely Observing, Adapting To Situations, Intermediating Between Artists And Audience, Adapting Language, Managing, and Coping With Artists' Sensitivities. These six concepts do not flow from the previous study. We did not find any reference to the earlier concept Involved And Creative. Managing, however, is related to the earlier concept Not Controlling. Moreover, Coping With Artists' Sensitivities is partly related to the earlier concept Help Focusing.

Eventually, we identified two emergent concepts for the category **Communication Skills**, namely Create A Good Atmosphere and Allow Trust And Honesty, both present in the questionnaire study. We did not find any reference to the earlier concept Unite All People. The detail of the concept classification is provided in Table. 6.2. It should be noted that concepts identified in the previous study are indicated with * in the table.

Mission Of Artistic Direction	Interaction With Musicians	Communication Skills
Aesthetic Context**	Observing	Create A Good Atmosphere**
Extra Set Of Ears**	Adapting To Situations	Allow Trust And Honesty**
Guidance**	Intermediating Between Artists And Audience	
Feedback*	Adapting Language	
Best Possible Artistic Result*	Managing*	
	Coping With Artists' Sensitivities*	

Table 6.2 Concept classification for the three main categories.

** Concepts already identified in Chapter 3, documenting the perspective of musicians and sound engineers; * Concepts related to a concept identified in Chapter 3.

6.3.1.2 Parallel between Mission Of Artistic Direction and Interaction With Musicians

Focusing on the first two categories, we found a junction between **Mission of Artistic Direction** and **Interaction With Musicians**. On one hand, **Mission of Artistic Direction** emerged abundantly from the questions focusing on 1) producer's role during recording sessions and 2) what makes a good music producer. These were two definition-related questions that encouraged producers to express themselves in terms of abstract criteria and functions through generic and impersonal discourse. On the other hand, the category **Interaction With Musicians** came out of the fourth question that explicitly asked producers to describe how they interact with musicians, e.g. to talk about their

own studio practices with the help of examples and personal involvement in their discourse. Therefore, a parallel could easily be drawn between concepts included in **Mission of Artistic Direction** and concepts included in **Interaction With Musicians**, if considering them on an axis moving from Abstract Concepts (mission) to Practices (interaction).

This two-dimensional analysis allowed us to establish five meta-categories that cut across **Mission Of Artistic Direction** and **Interaction With Musicians**, namely **From Context To Situation** linking the mission of Aesthetic Context with the interactions a. Observing and b. Adapting To Situations; **Intermediary Role** linking the mission of Extra Set Of Ears with the interaction Intermediating Between Artists And Audience; **Verbal Communication** linking the mission of Feedback and the interaction Adapting Language; **Direction** linking the mission of Guidance with the interaction Managing; and **Artistic Collaboration** linking the mission of Best Possible Artistic Result with the interaction Coping With Artists' Sensitivities.

6.3.1.3 Model of artistic direction with producers' various levels of involvement

We developed a model charting these five meta-categories to the record producers' levels of artistic involvement based on their descriptions (see the model in Table. 6.3). All six record producers agreed on the importance of first adapting to the specific context of the recording project, e.g. the size of the ensemble (CE1) (which corresponds to level 0, with no involvment). PF2 and PE6 reported situations when they could barely speak to the musicians during the sessions but where their presence as an extra set of ears on the project was important (which corresponds to level 1). CF3 detailed three scenarios of studio situations: first scenario, musicians know exactly what they want and the producer's task is only to provide feedback on technical aspects (which corresponds to level 2); second scenario, musicians have ideas but are not definite about what they want so the producer needs to guide them (which corresponds to level 3); and third scenario, musicians trust the producer enough to collaborate with her/him on artistic decisions, in that case the producer has many responsibilities (which corresponds to level 4).

Levels of Producer Artistic Involvement		**Meta-categories**	Concepts Abstract → Practice	
Not involved	0	**From Context To Situation**	Aesthetic Context**	a. Observing b. Adapting To Situations
Less involved ↓	1	**Intermediary Role**	Extra Set Of Ears**	Intermediating Between Artists And Audience
	2	**Verbal Communication**	Feedback*	Adapting Language
	3	**Direction**	Guidance**	Managing*
More involved	4	**Artistic Collaboration**	Best Possible Artistic Result*	Coping With Artists' Sensitivities*

Table 6.3 Model of artistic direction with various levels of producers' artistic involvement.

** Concepts already found in Chapter 3, documenting the perspective of musicians and sound engineers. * Concepts related to a concept identified in Chapter 3.

In the following sub-sections, we provide details about every concept presented in the model, following the structure in meta-categories. For each concept, we use *italics* to report producers' verbal descriptions, and **bold** to emphasize the discourse analysis. The concepts of Communication Skills will be presented afterwards. They are not present in the Model of artistic direction because these skills were described by producers for every level of artistic involvement.

6.3.2 Level 0: From Context To Situation

All six record producers[7] mentioned the need to identify the context of the recording in order to adapt to the situation accordingly. More specifically, four out the six (PF2, CF3, CE5 and PE6) addressed the abstract concept Aesthetic Context; CE1, PF2, CF3 and CF4 addressed the practice Observing, and all six producers addressed the practice Adapting To Situations. The abstract concept Aesthetic Context is characterized by a generic and impersonal discourse in contrast with the practices Observing and Adapting To Situations, both of which contain more personal discourse referring to the actions and activities of the producers (through the use of verbs).

The discourse analysis showed that temporality is very important is this meta-category, as it creates a chronological link between two phases: producers first listen and evaluate what the musicians propose and then adapt their interactions with them accordingly. For example, CF4 illustrated a clear distinction between a context where the producer and musicians already know each other well, as opposed to one where they do not. This second case leads to an observing phase that CF4 described using a metaphor of animal behaviour (*who are you, come here so that I can sniff you out*[8]). Conversely, in the first case, producers and musicians can skip the observing phase and directly adapt to that "well-known" situation.

6.3.2.1 Abstract: Aesthetic Context

Phrasings classified in this concept primarily include temporal adverbs and nouns, which indicate two temporal stages in the process of understanding the Aesthetic Context of the music to be recorded:

[7] Due to the small number of interviewees, we do not report the number of occurrences for each concept. Rather, we provide the number of producers who addressed each concept.

[8] *qui est-ce que tu es, viens que je te renifle* (CF4)

- in the first stage, producers have *to be attentive*[9] (PF2), ***first*** *listen to what they* [the musicians] *have to offer us*[10] (CF3), and *have somewhat of a* ***history*** *with what the artist is trying to do* (PE6).
- in the second stage, ***pretty quickly***, producers take the lead *in giving direction*[11] (PF2) and search out *balance between their own standards and reality*, i.e. *what the artist can do, the given performance* (CE5).

CE5 summed up this first mission as *a combination of understanding the music* [...], *the instruments, and the way the musicians play.* He also brought up the fact that *what you* [the producer] *think it should sound like is not always the same as what the musicians think it should sound like* (CE5). This discrepancy was further reflected in the different kinds of expressions producers contrasted to refer either to themselves or to the musicians: *the producer/we* vs. *the artist/the musicians/they.* Interestingly, CE5 used *the producer* vs. *the artist* when referring to the context evaluation, and then switched to the pronouns *you*[12] vs. *they* when describing the two chronological phases of the practices a. Observing and b. Adapting To Situations.

6.3.2.2 Practice: a. Observing

Producers used diverse **verbs** and **verbal nouns** from the **lexical field of observation** explicitly, e.g. *we* ***observe*** *each other, we* ***judge*** *each other, we* ***gauge*** *each other's ability*[13] (PF2), as well as metaphorically, e.g. *we* ***take the temperature*** *of the situation*[14] (CF4). The use of verbs and verbal nouns that refer preferentially to processes and actions can be interpreted as a first cue of a more "practical" and situated discourse, describing the practices in which the producers are involved.

[9] *être à l'écoute* (PF2)
[10] ***d'abord*** *écouter ce qu'ils ont à nous offrir* (CF3)
[11] *être* ***assez vite*** [...] *assez directif* (PF2)
[12] In English, the speakers can have an impersonal use ("*you know*" that could be replaced by "*one knows*") or vague use of the personal pronoun *you* (Kitagawa & Lehrer, 1990). In our case, CE5 uses a vague *you* without identifying specifically to whom it refers but including fuzzily himself and the addressee in the reference.
[13] *on* ***s'observe***, *on* ***se juge***, *on* ***se jauge*** (PF2)
[14] *on va* ***prendre*** *un peu* ***la température*** *de la chose* (CF4)

As in Aesthetic Context, temporality is very important, especially for PF2 who uses temporal nouns (*progressive stages of observation, a moment, three days*[15]), temporal verbs (*things get moving*[16]), and temporal adverbs and prepositions (*before, at this moment, in the first three days, after, at an earlier point*[17]).

6.3.2.3 Practice: b. Adapting To Situations

Record producers pointed out *a thousand little situations* [...] *that are all unique*[18] (CF4), *different* (CE5). These situations depend on various factors such as the type of music and the size of ensemble, e.g. orchestra vs. soloist (CE1). Producers used **verbs** to describe their actions and to emphasize the fact that *they have* ***to react*** *according to what we hear*[19] (CF3) and ***to adjust*** *to their* [the musicians]' *needs* (CE5). This adaptation *is a lot about feeling because it's pretty hard to quantify*[20] (CF4), e.g. *as a producer you really have* ***to try to feel well****, do we just go right into another one* [take] *or is it time* ***to stop*** *and* ***talk*** *about it* (PE6).

Producers provided examples containing **conditional** and **additive conjunctions** to introduce two or more options of how they adapt themselves depending on their evaluation of the context, e.g. *to talk a lot* ***if we feel*** *people need verbal support, and to talk a lot less* ***if we feel*** *everything is going well*[21] (CF3); ***either*** *I reinforce her/his vision of the album,* ***or*** *I see to it that I lead her/him somewhere else*[22] (PF2).

[15] *une phase [...] de rampe d'observation; un moment; trois jours* (PF2)
[16] *les choses démarrent* (PF2)
[17] *avant, à ce moment là, dans les trois premiers jours, après, en amont* (PF2)
[18] *mille petites situations* [...] *qui sont toutes particulières* (CF4)
[19] ***réagir*** *par rapport à ce qu'on entend* (CF3)
[20] *il y a beaucoup de feeling parce que c'est assez difficile à quantifier* (CF4)
[21] *beaucoup parler* ***si on a l'impression*** *que les gens ont besoin de ce soutien de la parole, et beaucoup moins parler* ***si on sent*** *que tout se passe bien* (CF3)
[22] ***soit*** *je le conforte dans sa vision de l'album,* ***soit*** *je m'arrange pour l'emmener un peu ailleurs* (PF2)

6.3.3 Level 1: Intermediary Role

All six producers addressed their Intermediary Role between the artists and the audience. More specifically, CE1, PF2, CE5 and PE6 mentioned the abstract concept Extra Set Of Ears, whereas all except CE5 referred to the practice of Intermediating Between Artists And Audience. This meta-category is marked by in-between spatial and temporal states, as if record producers were required to be at different places at the same time, doing various activities, looking for ubiquity. This is reflected by two metaphors: the producer as an *extension* of the musician, and the producer as a *point of intersection* between the recording and the audience.

6.3.3.1 Abstract concept: Extra Set Of Ears

Producers expressed the possibility vs. impossibility of musicians to distance themselves from their performance by using **auditory verbs** combined with **modality markers**, e.g. *I see myself as a responsible for the things that they* ***can't detect*** (PE6); *the playing makes it* ***impossible to hear*** *what comes out entirely, objectively* (CE1). Moreover, there is a conflict for musicians who cannot be involved in different activities (*listening* vs. *playing*) at **different locations** indicated with **spatial markers** (***inside*** *the control room*, ***behind*** *the glass*), e.g. *they are not listening to what is coming* ***out of*** *the speakers* (PE6); *when the musicians* ***outside*** *can't hear what they are doing because other people are playing or they are just, you know, in the moment of making music* (CE5); *because the musician is performing and they are not listening to their own performance as if they were* ***outside of their bodies*** (CE1). This conflict is solved by an extra person: the producer as *the first listener* (CE1) and *the extension of the ears of the musicians* (CE1).

Although this concept is described at an abstract level, we observed an increasingly personal involvement by the producers in their discourse than the first level **From Context To Situation** with a greater use of personal pronouns (individual or collective) to contrast *what* ***I*** *hear* with what ***they*** *are able to hear*[23] (PF2).

[23] *ce que* ***j'****entends* vs. *ce qu'****ils*** *peuvent entendre* (PF2)

6.3.3.2 Practice: Intermediating Between Artists And Audience

In this category, the use of nouns such as ***interaction*** (CF3), ***relationship*** *between producer and artists* (PE6), but also ***point of intersection*** *between* [...] *the recording and the audience*[24] (CF3), highlighted the producer's intermediating function. Moreover, the presence of verbs such as ***work together*** (PE6) and ***collaborate*** (CF4) emphasized the collaborative aspect of studio recording that engage different agents, i.e. *actors/musicians/performers*, *artistic directors/producers*, and *viewers*[25].

As for the concept Extra Set of Ears, these agents are dedicated to distinct actions. *The performers* ***don't have to decide*** *whether the tempo is faster or not or it's* ***someone else*** *who is going* ***to tell*** *them* (CE1); *so I* [the producer-listener] *ask them* ***to trust*** *me, and in turn I* ***am attentive***[26] (PF2). Indeed as CE1 underlines t*he producer can give advice, as a musician would be within the group* (CE1).

6.3.4 Level 2: Verbal Communication

All producers except PF2 mentioned Verbal Communication in their description of record producers' skills and competences. In this meta-category, we distinguished between the abstract concept Feedback and the practice of Adapting Language. Feedback (addressed by CF3, CF4, CE5 and PE6) focuses on the technical information producers offer the musicians, enabling them to change or adjust their playing. Thus it refers to the concept Criticism And Optimization identified from the questionnaire study but it is not expressed in the same words. Feedback is content-focused and characterized by impersonal discourse. In the other hand, Adapting Language is focused on the manner, the language tricks producers use. All producers except PF2 mentioned their need of Adapting Language by providing examples and using more personal discourse (explicit involvement in phrasing).

[24] *lieu de passage entre* [...] *l'enregistrement et leur public* (CF3)
[25] *spectateurs*
[26] *donc je leur demande de me faire confiance, et moi je suis à l'écoute* (PF2)

6.3.4.1 Abstract concept: Feedback

The lexical analysis of the phrasings revealed a diversity of ***technical issues*** (CE5) that producers might need to point out to musicians. These technical issues include tuning (*things are* ***out of tune*** - PE6), tempo (*things are out of* ***time*** - PE6), and performance intensity (*that's the biggest watchdog is keeping the* ***intensity level*** *and the* ***energy up*** *in the performance* - PE6). CF4 also mentioned that his job is first *to ensure that everything is pretty much* ***in tune*** *and* ***in time*** *in the best possible way,* [...] *that it is* ***clean*** *and that we have pretty much all the measures*[27].

Producers' discourse is mostly impersonal, characterized by 1) **impersonal pronouns** (*that* ***it*** *is in tune*[28]- CF3, that **it** is clean[29]- CF4); 2) **referring expressions** (***things*** *are out of time* – PE6); and 3) **infinitive verbs** (***to ensure*** *that everything...* - CF4). This reflects the objective status that producers give to technical issues.

When, on the other hand, personal markers are used, they are used collectively, e.g. ***we*** *have pretty much all the measures* (CF4); ***we*** *start talking tempo*[30] (CF3); *the other tricky parts for producers that* ***you*** *have to balance the details versus the all*[31] (CE5). These last results can be interpreted as presenting such technical issues as shared knowledge.

6.3.4.2 Practice: Adapting Language

Producers explicitly brought up that *with the* ***right kind of words****, you can get them* [the musicians] *to* ***follow you*** (CE1). Moreover, *if somebody is sensitive you have to* ***change the way you express yourself*** (CE5). Indeed producers use ***tricks*** (CF3) and varied word usage to conduct recording sessions: they have *the choice to be positive or negative*[32]

[27] *faire en sorte que tout soit à peu près* ***juste*** *et* ***en place*** *de la meilleure manière possible* [...], *que ce soit* ***propre*** *et qu'on ait à peu près toutes les mesures* (CF4)
[28] *que* ***ça*** *soit juste* (CF3)
[29] *que* ***ce*** *soit propre* (CF4)
[30] ***on*** *commence à parler tempo* (CF3)
[31] as previously noticed in the footnote 12, CE5 makes an impersonal use of the pronoun you which refers fuzzily to the producers and may include the addressee and himself in this collective.
[32] *le choix d'être positif ou négatif* (CF4)

(CF4) or *to be **fairly straightforward*** vs. *if I see that being straightforward and honest like that isn't working, because someone is defensive, or they are sensitive about that* [...], *then my comments are **much more general*** (CE5).

More specifically, producers qualify the musical performance instead of qualifying the person, as illustrated by the example of CE5: if the person is sensitive I might say something like, "*the **B-flat** maybe could be a little higher" [...], instead of just coming out and saying, "**You** are flat!" And that's the worst thing to say "**you are** flat!" You know, because it sounds like an accusation,* [...] *especially to a singer, it's not you are flat, "the **B-flat** just, maybe sounds a **little** too **low**" or, "I wish it were a little higher*". Here CE5 replaced negative lexicon by a more neutral one, e.g. *I usually don't use the words flat or sharp,* [...] *I usually use the words like **low**, **high*** (CE5). Furthermore, "*it sounds to **me**...*" also puts the emphasis on the feeling of the producer instead of a judgment on the musician (**you**) and his/her performance. Eventually CE5's discourse contained modality markers (maybe, could be, a little, it sounds to me) in order to moderate the statement.

Producers provided other strategies than those based on word usage:

- bluff (*invent some other reasons* - CE5)
- motivate the musicians ("*you're almost there but just this little bit,* [...] *it was already better but I know that you can do it better, and I know that you will hate me if I don't ask you to play this again*" - CE1)
- save compliments for striking takes (*I tend not to necessarily always give a compliment after every take* [...] *if something really is striking and is really special* [...] *and beautiful I kind of save for those moments* - CE5)
- balance between collective (through speakers) vs. personal comments (via individual talkback) to avoid humiliation amongst the group, e.g. *if there is a singer out there and there is a note that is constantly flat,* [...] *you don't want just announce this in front of everybody, so you get on the phone* (CE5); *when somebody was* ((very noisy breathing of a wind player)) *like you know this funny breath!* [...] *The last thing you do is go "who is making that funny sound?"* (PE6).

6.3.5 Level 3: Direction

All producers except CF3 talked about the management role of record producers. Similarly to level 3, we distinguished the abstract concept of Guidance And Direction (CE1, PF2, CE5 and PE6) from the practice of Managing (PF2, CF4, CE5 and PE6). The abstract concept is characterized by mostly impersonal discourse describing Guidance as "the role of the producer". In contrast, within Managing, producers primarily used personal pronouns with a large involvement in their discourse to report specific cases and examples.

6.3.5.1 Abstract concept: Guidance

To describe this level of involvement, producers used nouns, adjectives and verbs referring to 1) **suggestion** (*to make **suggestions** in order to improve* - CE1; *I **suggest** concepts to them*[33]- PF2); 2) **guidance** (to **guide** the artist[34] - PF2); to try to guide the session in a positive way - CE5); and 3) **direction** (*and once we know that the **direction** is good, and that we have chosen one, whatever happens to stick to it*[35]- PF2). Except PF2 who used plenty of personal pronouns, both individual (*to lead the artists in an artistic direction that **I** decided on*[36]) or collective (*it's up to **us** to bring her/him to the place where s/he can let her/himself be carried along*[37]), the producers mainly referred to this abstract concept with impersonal discourse (***the role of the producer** is to try to guide the session in a positive way* - CE5; ***the producer** has to have a musical opinion* [...] *and has to make suggestions* - CE1). They did, however, use personal pronouns when moderating their statement (*in **my** opinion* - CE1, ***my** feeling is / **I** think that the role of the producer is* - CE5) or when adopting the perspective of the musician (*it's what **I** want **when** I **am playing**, I want someone giving it to **me*** – PE6).

[33] *je leur propose des concepts* (PF2)
[34] ***guider** l'artiste* (PF2)
[35] *et une fois qu'on sait que la direction est la bonne, et que l'on en a choisi une, en tous les cas s'y tenir* (PF2)
[36] *c'est d'amener l'artiste dans un axe artistique que* j'*ai décidé* (PF2)
[37] *c'est à **nous** de l'emmener là où il faut de façon à ce qu'il se laisse porter* (PF2)

6.3.5.2 Practice: Managing

The lexical analysis highlighted a large variety of verbs (*to impose, to decide, to choose, to direct, to lead, to be demanding* vs. *to let things go*[38], *to push, to ride*) combined with nouns (*direction, authority, pressure vs. freedom*[39], *decision/indecision*) and adjectives (*picky, brutal*[40]) referring to **managing** and **control**. PF2 illustrated just such a combination in the following statements: *I **decide** / I **impose** them things / I often **choose** the takes / I **lead** them in the direction that I **want***[41].

PE6 justified the need for authority with the observation that once decisions are made people calm down, whereas indecision in a session makes artists very upset. Authority in the studio can be very tough for musicians, as one can imagine from PE6's anecdote: *I was **pushing** him like I push a rock drummer* ((laugh)) *or anybody else, with the **constant talkback** you know "that wasn't good do it again go back boom boom boom".* [...] *And later we went out for a beer and he said* ((laugh)), *"Man no one ever **rode** me like that before", like he just could not believe how **brutal** I was. I said, "is that ok?" he goes "well, you know, we got a good record" but you know he was not in love with me during the sessions.* For PE6, this managing strategy pushed the musicians into this machine-like mode where they didn't have to think about what was good and what wasn't. Similarly, CF4 talked about how *to do what it takes so the people do not think anymore*[42] and he reported that the producers' role is *to do what it takes so that the musicians put themselves little by little in the position of the medium and not in the position of the one who controls everything*[43].

Producers were rather verbose in providing examples of how they set their authority, e.g. *you are obliged to impose your authority*[44]; *we are doing this now because that's*

[38] *imposer, décider, choisir, diriger, emmener, embêter* vs. *relâcher*
[39] *autorité, pression* vs. *liberté*
[40] *pinailleur, brutal*
[41] *je **décide** / je leur **impose** des choses / je **choisis** souvent les prises / je les **emmène** dans la **direction** que **j'ai envie*** (PF2)
[42] *faire en sorte que les personnes ne pensent plus* (CF4)
[43] *faire en sorte que les musiciens se mettent petit à petit justement dans la position du medium, et pas dans la position de celui qui contrôle tout* (CF4)
[44] *t'es obligé d'imposer ton autorité* (CF4)

how it is[45] (CF4). CF4 also gave one example of a particular technique that consists of *being demanding and then relaxing* [...], *mixing the picky side with the laid-back side*[46]. Nevertheless, CF4 remarked that *the producer does not necessarily have to tell the musician what s/he has to play*[47]. This remark points out the compromise producers have to make, between - on the one hand - how they adapt language in order to handle artists' sensitivities (level 2), and - on the one hand - the occasional need to be directive and intrusive about the performance (level 3). Eventually, their work consists in a balance between direction and coaching that can sometimes result in a deeper collaboration with the artists (level 4).

6.3.6 Level 4: Artistic Collaboration

All producers mentioned Artistic Collaboration with musicians as "an ultimate purpose of their profession". This meta-category comprises two concepts. The first, Best Possible Artistic Result (addressed by CE1, PF2, CF3 and CF4), describes the producers' contribution to drawing out the best possible performances from musicians. This abstract concept refers to the wish musicians reported in Chapter 3: that producers should be involved and creative in the project. The second concept flows from all six of the record producers mentioning the necessity of Coping With Artists' Sensivities in order to ensure the success of the artistic collaboration.

6.3.6.1 Abstract concept: Best Possible Artistic Result

The linguistic analysis presented many verbs (mainly infinitive forms), some referring to **movement** combined with **spatial adverbs**, as shown by PF2 who mentioned searching for *a way* ***to lead them*** [the musicians] ***somewhere else***, [...] ***beyond*** *what they themselves could have imagined*[48]. Most of the other verbs referred to **extraction** and **disclosure** of *what they* [the musicians] ***really have inside them***[49] (CF3), e.g. *he* [the

[45] *on fait ça maintenant parce que c'est comme ça* (CF4)
[46] *il faut embêter et puis après on relâche* [...], *mélanger le côté pinailleur avec le côté je relâche* (CF4)
[47] *c'est pas forcément le rôle du directeur artistique de dire au musicien comment il doit jouer* (CF4)
[48] *de façon à l****es emmener ailleurs*** [...], ***au-delà*** *de ce que lui même aurait imaginé* (PF2)
[49] *d'essayer de sortir d'eux ce qu'ils* ***ont vraiment en eux*** (CF3)

producer] *is much more there* ***to reveal****, to do what it takes so that an artist* ***reveals the most intimate part of her/his interpretation***[50] (CF4); *another role* [of the producer] *is* [...] ***to*** *help* ***extract*** *from the musicians the* ***best possible interpretation or performance****.*

6.3.6.2 Practice: Coping With Artists' Sensivities

The lexical analysis of the phrasings showed that this theme deals explicitly with *psychology* (CF3, PF2) and *psychological methods* (CF3) that producers employed to cope with artists' sensitivities. Indeed, in talking of their experience, all producers brought up the issue of working with *really really difficult artists* (CE1); *artists who are too much like divas*[51] (PF2); and *mad in the sense of being paranoid*[52] (CF3). Therefore, producers needed to be able to handle *situations where people are very tense and nervous, upset* (PE6) or *things that nobody else wanted to do because it was psychologically complicated*[53] (CF3). To manage these situations, CE1 proposed *to give them* [the musicians] *the feeling that everything is fine and that everything is under control*; CF4 advised to *make* [musicians] *play,* [...] *that draws their attention to other things*[54] or *to emphasize the positive aspects* [...] *and to let the negative sides go*[55]; and CE5 recommended to *go through what they are going through if they are upset,* [...] *acknowledge that they are upset* [...] *and then, find a solution.* Finally, CF3 expressed the possibility *to divert aggressiveness towards himself*[56].

Eventually, CF3 remarked that *it is much easier to put a musician down than to help her/him*[57]. Producers also stressed the limits of their psychological skills to handle artists'

[50] *il est beaucoup plus là pour* ***révéler****, pour faire en sorte qu'un artiste* ***révèle la partie la plus intime de son interprétation*** (CF4)
[51] *des artistes un peu trop artistes* (PF2)
[52] *fous dans le sens paranoïaques* (CF3)
[53] *les trucs que personne d'autre ne voulait faire parce que c'était compliqué psychologiquement* (CF3)
[54] *faire jouer* [...] *ça attire l'attention sur d'autres choses* (CF4)
[55] *mettre en avant les aspects positifs* [...] *et laisser passer les côtés négatifs* (CF4)
[56] *détourner l'agressivité vers soi* (CF3)
[57] *c'est beaucoup plus facile de casser un musicien que de l'aider* (CF3)

anxiety, e.g. *there are times, you can use all of your powers of persuasion, the anxious person* [...] *will remain anxious*[58] (CF4).

6.3.7 Communication skills

As explained in section Concept identification in the three main categories, **Communication Skills** are not part of the Model of artistic direction, as these skills were described by interviewees for each and every level of artistic involvement. PF2 stated, *a record producer, s/he is a musician, s/he is an engineer, s/he does not raise her/himself the question*[59]. That may be why interviewees, as well as the respondents of our questionnaire study, did not go into detail about obvious musical and technical skills, but insisted on communication and inter-personal skills. According to CF3, *it's not by chance that we do this job* [...], *as a child I had been put in certain situations and I had been forced to learn by myself how to figure it all out, and so I could do it in life.*[60] Similarly, CE1 and PE6 mentioned that they were particularly good at dealing with psychological situations, e.g. *I have been able to calm down the most difficult artist and it's like a wild horse, I have been able at the end of the session to have them eating from my hand* (CE1); *I have good bedside manner, get on a lot of crazy neurotic people I am pretty good with them. In fact when I started working here that was my specialty was dealing with the crazies* (PE6). However, communication skills are not limited to extreme situations and all six producers also addressed two other main concepts as essential skills for conducting any kind of recording session, namely Create A Good Atmosphere and Allow Trust And Honesty.

[58] *il y a des fois, tu peux user de tous tes talents de persuasions, la personne angoissée* [...] *restera angoissée* (CF4)

[59] *un réalisateur, il est musicien, il est ingénieur, il ne se pose même plus la question* (PF2)

[60] *c'est pas un hasard si on fait ce métier,* [...] *j'avais été en temps qu'enfant mis dans certaines situations et j'avais été obligé d'apprendre tout seul à comment dépatouiller tout ça, et du coup, j'y arrivais dans la vie.* (CF3)

6.3.7.1 Create A Good Atmosphere

All producers except CE5 mentioned the importance of creating a good and positive atmosphere for the recording session, e.g. *I like to put people in a* ***state of comfort technically***, ***psychologically***, *and let's say* ***emotionally***[61] (PF2) ; *to put them* ***at ease*** [...] *to create an* ***atmosphere*** *where the people feel like playing*[62] (CF3); *I like to run around a lot make sure* ***everyone is ok*** [...] ***everything is cool*** (PE6).

6.3.7.2 Allow Trust And Honesty

All producers except CF4 addressed this concept using nouns, adjectives and verbs referring to **trust**, e.g. *in order for them to be completely* ***confident***, *it's necessary that the people before them are not judging them*[63] (PF2); *the most important thing in the relationship for the art from the artists' side is that* ***they feel that the producer understands*** [...] *their needs and their musicianship* (CE5); *you are to be able to* ***convince*** *them* [the musicians] *that* ***you are able to hear and to understand*** *what they want* (CE1). Furthermore, CE1 explained, *the* ***trust*** *will come after very short time when they notice that I am as serious as they are in getting the best result, and we are on the same boats in trying to get the best out of their performance in every sense of the word.* Similarly, PE6 allowed trust by *telling the artists before the recording that our collective goal is to make something really great* (PE6).

6.4 Discussion

In describing each of the various levels of artistic involvement during recording sessions, a minimum of five out of six producers reached consensus on the following issues: 0) observing

[61] *j'aime mettre les gens dans des* ***conditions de confort technique***, ***psychologique***, *et on va dire* ***émotionnel*** (PF2)

[62] *les mettre à l'aise* [...] *fabriquer une atmosphère où les gens ont envie de jouer* (CF3)

[63] *pour qu'ils soient en pleine* ***confiance***, *il faut qu'en face ils aient des gens qui ne soient pas en train de les juger* (PF2)

the recording situation and adapting their working approach according to the aesthetic context; 1) intermediating between the artists and their future audience by providing an extra set of ears on the project; 2) adapting their language when providing feedback on technical issues of the performance; 3) managing by guiding and giving direction between takes; and 4) collaborating deeply with artists to achieve the best possible result. Producers base their artistic involvement on musicians' preparation, requests and personality, as well as the size of the ensemble. Most recording sessions require feedback (level 2) and direction (level 3); sometimes minimum coaching (level 1); only a few sessions allow producers to collaborate deeper with the artists (level 4). Indeed the ultimate level of artistic involvement consists in drawing the best musical performance out of the artists. To do so, we found that record producers needed to cope with artists' sensitivities, which is in keeping with Neuenfeldt's statement (2007) regarding the need to deal with the psychology of performance and with artists' ego. It should be noted that record producers did not specify if the choice of level of artistic involvement was depending on particular musicians' personality, culture, genre or age.

In keeping with findings from our previous questionnaire study (Chapter 3), record producers aim to create a good atmosphere for performance and allow trust and honesty in the studio by convincing the artists that they understand their music and that their collective goal is to produce a high-quality recording together. During the interviews, however, although almost all the concepts raised by young musicians regarding their collaboration with a record producer were discussed in-depth, we observed very little discussion of the Unite All People idea.[64] This illustrates the differences of perspectives between musicians and producers: while the former expect a producer to help them build a team, producers focus on the musicians as individuals. While producers are interested in the results and need to deal with the psychology necessary to draw out the best possible performance, their role is not to change the dynamic of the ensemble and they cannot solve personal problems. Furthermore, we had pointed out a somewhat paradoxical evaluation of producers' involvement: on the one hand, musicians reported their willingness to work with a producer who would be deeply involved in their project; but on the other hand, they reported to fear that an external producer would be too intrusive. Findings from the interviews showed that producers are creative and deeply involved in the project only in situations that makes this

[64]Except PF2 who sees himself as an arranger (agenceur in French).

level of involvement possible (level 4). Moreover, producers illustrated managing situations (level 3) with examples that were likely to confirm the musicians' fear of being controlled. They justified the need to give direction and impose authority because indecision in the studio generates stress. However, they reported staying at level 2 if they felt they did not have the space for direction.

Our model of record producers' artistic involvement during recording sessions expands Hennion's concept (1989) of "intermediary between production and consumption." Interestingly, our four top levels of producers' involvement corresponds to Jyrämä's levels of mediating roles in management (2008): 1) Support mediator who gives credibility and means is related to Intermediary Role; 2) Team mediator who is involved in an integral part of the discussions is related to Verbal Communication; 3) Managing mediator who is the driving force is related to Direction; and 4) Producer mediator who has crucial importance because of her/his expertise is related to Artistic Collaboration. This parallel highlights similarities between artistic production and other production contexts. The observation and adaptation level (0) was not mentioned by Jyrämä, which may be explained by the specificity of artistic projects to be defined after the beginning of the production.

In keeping with Proust' investigation of the role of actor directors (2006), record producers pointed out the importance of adapting language and establishing a trust relationship with the artists to achieve the best possible result. Producers provide an extra set of ears from the control room for those details musicians cannot hear outside their bodies, which parallels the choice of directors to observe the actors from the audience seats as opposed to working on stage with them. Although both roles present many similarities, actor directors do not adapt their level of artistic involvement to the actors' requests or personality, except in rare cases when they collaborate with very renowned actors. Because of the client relationship with musicians, record producers need to "take the temperature" of the situation before giving direction. It should be noted that the audience attributes the shape and quality of musical recordings to the musicians and not to the record producer, while film and play quality are dedicated to both the director and the actors.

6.5 Conclusion

Insights from producers who have worked throughout the transition of the recording industry complemented findings from our previous questionnaire study (Chapter 3). Findings from both studies converge to show that the perceived role of record producers has not changed despite the current *Do It Yourself* production context. Nevertheless, studio professions are likely to encounter transformations with the new generation of sound engineers and record producers who must juggle both roles at once (Neuenfeldt, 2007), as well as adapt to ever-tighter budget constraints (Chapter 5). Therefore, the present investigation constitutes a theoretical ground to allow comparison with future studio practices.

Our interdisciplinary approach combining content and in-depth linguistic analyses of interviews allowed us to identify many record producers' practices, techniques and strategies for studio sessions. We would like first to stress the contribution of the first author's professional experience in music recording, which was critical in the identification of the concepts, categories and meta-categories. This observation is in keeping with Corbin and Strauss who emphasize that the coder's professional experience can enhance the *sensitivity* of qualitative analysis, meaning "having insight, being tuned to, being able to pick up on relevant issues, events, and happening in data" (2008). Sensitivity can reduce *objectivity*, which we upheld by the collaborative qualities of our analysis. Furthermore, the linguistic analysis of the phrasings classified into concepts, categories and meta-categories provided us with a more refined classification to identify relationships and distinctions between abstract concepts (what the producers aim for) and studio practices (how they proceed in order to reach these goals). Furthermore, the linguistic analysis of the phrasings classified into concepts and meta-categories provided us with a more refined classification to identify relationships and distinctions between abstract concepts (what the producers aim for) and studio practices (how they proceed in order to reach these goals).

This investigation of record producers' best practices is the main part of a wider research project that aims at casting light on studio professionals' contribution to the quality of musical recordings. Further research will extend these theoretical findings with a field experiment during recording sessions investigating the relative contribution of musicians'

self-evaluation and producer's comments to the quality of a recording. This field experiment will enhance our understanding of what record producers call "extending" the ears of the musicians to the control room. It will also address the challenge of repeating the same musical passage many times during recording sessions.

The similarities observed with other cultural and production contexts suggest the applicability of our model to other managerial contexts. Future research is required to operationalize and test the validity of the proposed model of artistic direction in other artistic fields and more broadly in other multi-agent production contexts, such as design, project management, student supervision.

6.6 Acknowledgments

We would like to warmly thank the six world-renowned record producers who accepted to take some time to share their knowledge with us. We would also like to thank Terri Hron for her English corrections and Abigail Kniffin for her translations of the French quotations. The first author is funded by the Fonds Québécois pour la Recherche sur la Société et la Culture (FQRSC) and the Centre for Interdisciplinary Research on Music Media and Technology (CIRMMT), Montréal, Canada. The second author, funded by the Innovative Center for Advanced Sensors and Sensor Systems (INCAS3), Assen, The Netherlands, stayed at CIRMMT as a visiting researcher between January and June 2011.

Part III

Impact of record producers' comments on perceived quality

Chapter 7

Impact of producers' comments and musicians' self-evaluation on perceived recording quality

The following chapter has been adapted from:

Pras, A. & Guastavino, C. Impact of producers' comments and musicians' self-evaluation on perceived recording quality. *Journal of Music Technology and Education.* Submitted.

Furthermore, a preliminary version of the results was published and received the Student Paper Award in:

Pras, A. & Guastavino, C. (2011). Impact of producers' comments and musicians' self-evaluation on recording quality during recording sessions. In *Proceedings of the 131st Audio Engineering Society* Convention *(AES)*, New York, NY, USA.

The questionnaires that were designed for this experiment are available in Appendix E. The coding scheme of the analysis is available in Appendix G.

7.1 Introduction

While recording in the studio, musicians encounter challenges that differ from concert situations. They are expected to play at their best level for long hours without the presence of an audience, and to repeat the same musical work and focus on short sections (Chanan, 1995), which likely reults in fatigue, loss of motivation and self-confidence. Moreover, "recording cannot be transparent" (Patmore & Clarke, 2007), which implies that recording technologies distort various features of the musical performance heard in the studio. The introduction of electrical recording techniques at the end of the 1920s allowed studio professionals to balance and manipulate microphone signals in the control room, acoustically isolated from the studio where the musicians are performing. To get a closer feedback of the recording, musicians can now hear their performance through headphones. However, this technique may alter their playing and the dynamic of the ensemble is likely to become less natural. Therefore, when recording in the studio, musicians lack an accurate listening reference to improve from one take to another (see Figure 7.1).

To minimize recording difficulties, record companies traditionally hired record producers who were responsible for the entire production process (Reisman, 1977). External to the ensemble and with extensive listening skills (Neuenfeldt, 2007; Zager, 2006), record producers are expected to play an unbiased intermediary role between the artists and their future audience (Hennion, 1989). During recording sessions, producers typically provide comments to the musicians between takes. In the traditional business model of recording companies, producers were demanding with the performers, without necessarily consulting them about artistic decisions (Chanan, 1995; Hennion, 1989; Reisman, 1977). Since the 1980s, the recording industry has encountered major transformations that strongly impacted on the organization of recording sessions and the working conditions for record producers (Burgess, 2008; Chapter 5). In the present days, musicians tend to manage their recordings and make artistic decisions themselves (Jouvenet, 2007). In this *Do It Yourself*

(DIY) context of production (Strachan, 2007), performers do not necessarily hire an external producer during the recording and when they do hire a record producer, the client relationship without record company as intermediary may damage the artistic collaboration of the production process.

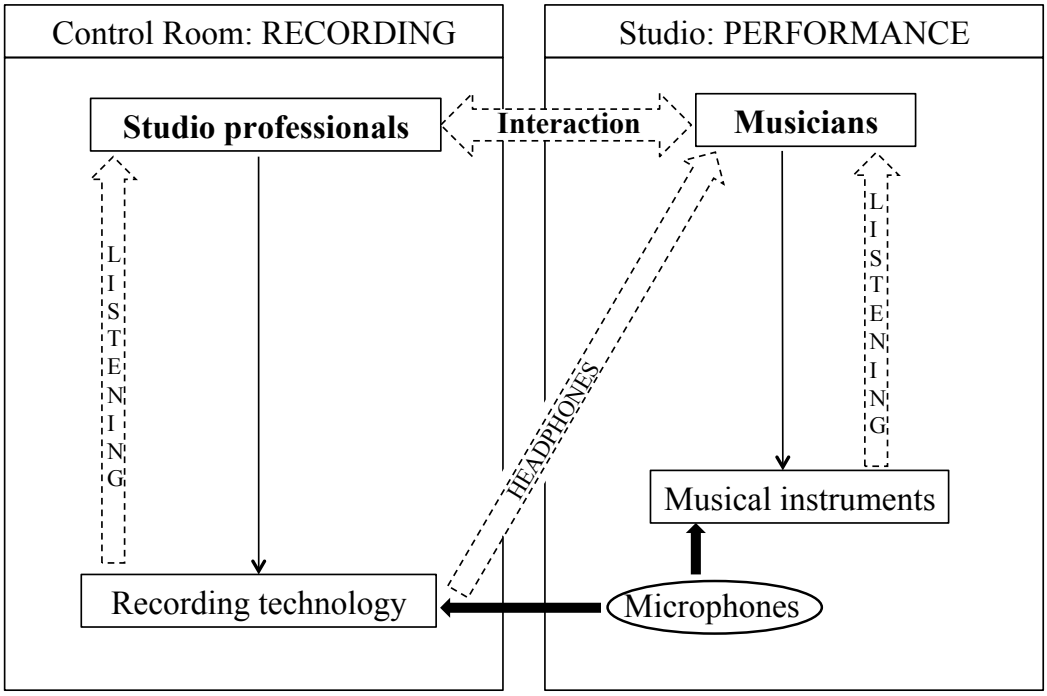

Figure 7.1 Listening while recording in the studio.

Note: [- - -] indicates different types of feedback.

According to a recent survey (Chapter 3), young musicians in the current recording context expect a record producer to exhibit strong communication and interpersonal skills, and to take into consideration the music aesthetics when providing comments between recorded takes. However, findings regarding the level of artistic involvement of the record producer gave rise to somewhat paradoxical evaluations: on the one hand, musicians reported fear that an external producer would be too intrusive during recordings sessions; but on the other hand, they reported their willingness to work with a producer who would be deeply involved in their artistic project. We further investigated this perspective through

interviews of world-renowned producers representing various musical genres. Interviewees reported adapting their level of artistic involvement to each recording situation, ranging from minimal to in-depth collaborations with the musicians as a function of musicians' requests, preparation and personality, as well as the size of the ensemble (Chapter 6). They emphasized the importance of providing positive feedback and qualifying the musical performance instead of the musician to avoid what could be perceived as personal accusations. To illustrate how they adjust the language, a producer would say "The B-flat maybe may be a little higher" instead of, "You're flat!" (Chapter 6). Producers also commented on the communication skills needed to create a good atmosphere for recording and allow trust and honesty in the studio. These studies provided insights on the perceived roles and mission of record producers, but they both rely on memory representations using a theoretical investigation. The present study represents an extension of this line of research with an empirical investigation in a recording studio. This field experiment aims to better understand the impact of the producer's artistic involvement on musicians' experience and performance while recording.

Conducting a studio experiment to complement questionnaires and interviews is in keeping with Larsen (2008)who suggests investigating multiple perspectives to document media practices. We thus conducted recording sessions bringing together musicians and record producers to investigate the effect of producers' comments on perceived quality.

To ensure the ecological validity of a studio experiment in the current context of the recording industry we considered the *Do It Yourself* (DIY) trend of production (Strachan, 2007), in which performers are likely to record without an external producer. Hence, we hypothesize that self-evaluation plays a crucial role in the artistic process of the production, and we propose to evaluate the effect of self-evaluation after listening to the takes on the progression of the recorded performances. To investigate the impact on musical performance of having an external record producer providing feedback, as opposed to musicians relying on self-evaluation for DIY productions, we designed four experimental conditions combining two types of feedback: with or without comments from an external record producer, and with or without self-evaluation after listening to the takes in the control room.

7.2 Method

7.2.1 Experiment context

We conducted recording and listening sessions of the experiment in the James L. Dolan Music Recording Studio (see a picture of the studio in Figure 7.2[1]) of the Steinhardt School of Culture, Education and Human Development of New York University (NY, USA). Designed in 2009 by the acoustician John Storyk for music production, research and teaching purposes, this new complex includes a control room, a large room, two smaller cabins and features high quality recording equipment such as a 48-channel Duality SSL console, (Solid State Logic, England), high standard microphones and Lipinski loudspeakers (Lipinski Sound, MD, USA).

The expert evaluation took place in the Critical Listening Laboratory of the Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT, Montréal, QC, Canada). This ITU standard room provides high quality controlled listening conditions such as B&W 802D loudspeakers (Bowers & Wilkin, West Sussex, England).

Figure 7.2 James Dolan Studio of NYU Steinhardt

[1]Photo by Cheryl Fleming Photography

7.2.2 Participants

Five record producers and twenty-five musicians participated in the field experiment. Musicians were selected from the Jazz Studies program of NYU Steinhardt. As an incentive for participation, we provided them with a mix of the resulting tracks that they could use as demo, thus imitating a real-life situation. In a pre-production meeting with each ensemble, we ensured that four compositions would be ready for the recording session and we decided on the recording set-up with the ensemble. No artistic guidance was provided during these pre-production meetings.

The 25 musicians (23 male, two female, *Mean age* = 24, *SD* = 7 (all Canadian or American) were grouped into one trio, three quintets and one septet. Each ensemble used the studio for one day. Four ensembles consisted of students from the NYU Steinhardt Jazz Studies program (Mean age = 21, SD = 2); the septet was a professional ensemble (*Mean age* = 33, *SD* = 8). The 18 student musicians reported an average of 12 years of musical practice (*SD* = 3) and 5 years of studio experience (*SD* = 2). The seven professional musicians reported an average of 24 years of musical practice (*SD* = 10) and 18 years of studio experience (*SD* = 9). All participants were active jazz musicians with studio experience, so the results will be presented for all 25 participants together. Twenty-two out of 25 (88 %) reported also playing other music genres than jazz (pop, rock, classical, hip-hop, latin, electronic, etc).

Three producers, musicians Andy Milne (27 years of studio experience) and Chris Tordini (10 years of studio experience), as well as sound engineer Paul Geluso (26 years of studio experience), each produced one of the recording sessions. The first author of this chapter, who has a professional background in recording (12 years of experience), produced the last two sessions. Hence, two sessions were produced by professionals whose primary background is music performance; three were produced by professionals whose primary background is sound recording. The Montreal-based jazz drummer Philippe Melanson and the first author evaluated the recorded takes a few months after the experiment to allow another appraisal of the results, referred to as expert evaluation throughout the chapter.

7.2.3 Experimental procedure

The experiment included three parts for each ensemble 1) a six-hour recording session (divided into two hours of sound check and four hours of tracking); 2) a two-hour listening session two to four weeks after the recording session during which musicians evaluated the different takes; and 3) a ten-hour expert evaluation (divided into three sessions) eight to twelve months after the recording sessions during which two producers evaluated the different takes. Each recording session used a two-by-two factorial design resulting in four experimental conditions: N] No producer & No self-evaluation, S] No producer & Self-evaluation, P] Producer & No self-evaluation, PS] Producer & Self-evaluation (see color scheme in Table 7.1).

	No self-evaluation	**Self-evaluation**
No producer	**N**	**S**
Producer	**P**	**PS**

Table 7.1 Color scheme for the four experimental conditions

The musical ensembles were asked to rehearse four original compositions and recorded one composition per condition. They chose the order of the pieces they were to record but we counterbalanced the order of the experimental conditions across ensembles. Between each experimental condition, musicians were given a short break.

For each composition, we recorded three complete takes under one experimental condition (see the experimental procedure in Figure 7.3). In all conditions, performers were free

and encouraged to discuss amongst each other between takes. For two conditions (N and P), the musicians were not allowed to listen to the takes in the control room. For the other two (S and PS) they were asked to listen to take 1 before recording take 2, as well as to listen to take 2 before recording take 3. For the conditions P and PS, an external record producer provided comments to the ensemble between take 1 and take 2, as well as between take 2 and take 3. To allow further analysis, communications between takes amongst musicians and with the record producer were recorded.

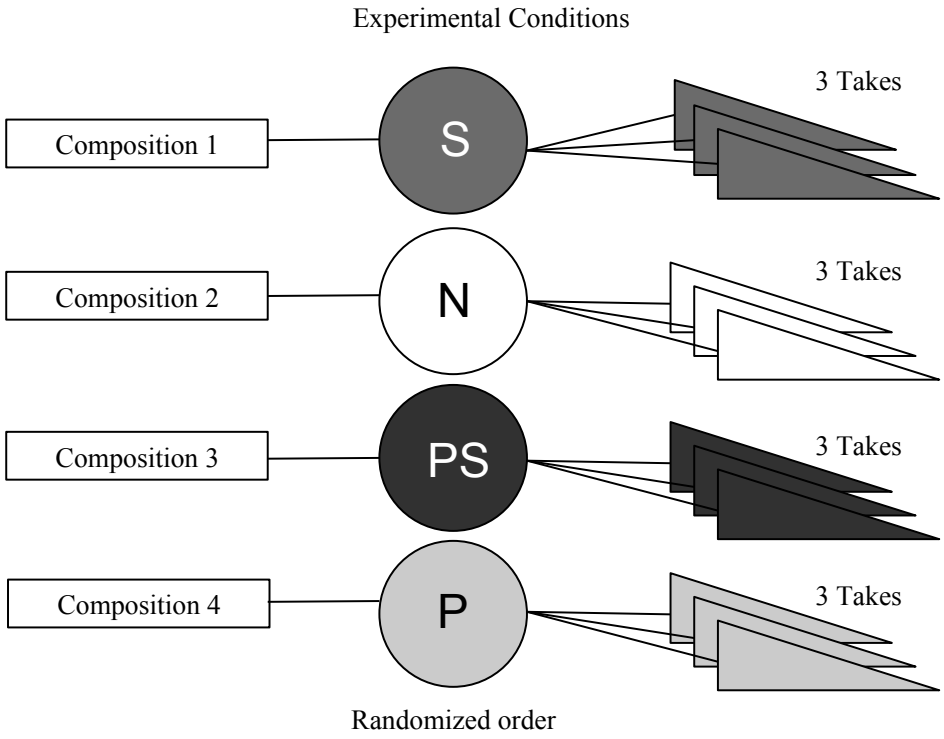

Figure 7.3 Experimental procedure during the recording session

After recording three complete takes of a musical composition, participants were asked to fill out the *recording session questionnaire* [Q.1]. Two to four weeks later, twenty-three participants came back to the studio to listen to the rough mixes of these takes and were asked to fill out the *listening session questionnaire* [Q.3]. At the end of both the listening and the recording sessions, participants were asked to fill out a *final recording session questionnaire* [Q.2] and a *final listening session questionnaire* [Q.4]. During listening sessions,

we counterbalanced the order of the conditions, but the takes were presented in the same order as the recording to allow a description of their evolution. Eight to twelve months after the completion of the field experiment, two experts listened to all the recorded takes and filled out the *expert evaluation questionnaire* [Q.5]. During the expert evaluation we counterbalanced the order of the conditions and ensembles (total of 20 compositions), but the takes were presented in the same order as the recording to allow for a description of their evolution. The detail of the questionnaires is available in the Appendix E.

7.2.4 Questionnaire design

To design our questionnaires, we considered previous studies on self-evaluation and/or music performance evaluation in music education research. Bergee and Cecconi-Roberts (Bergee & Cecconi-Roberts, 2002) used pre-defined evaluation forms based on three music criteria for all instruments, i.e. Tone, Interpretation, and Musical Effect, combined with specific criteria such as Mallet Technique for percussions or Articulation for brass (Bergee, 1997). May (2003) designed the Instrumental Jazz Improvisation Evaluation Measure (IJIEM) to evaluate improvisation features in jazz performance using seven music criteria, namely Technical Facility, Rhythm/Time Feel, Melodic/Rhythmic Development, Style, Harmony, Expression, and Creativity. But these closed-ended questions all confine answers into pre-defined categories and are genre specific. To our knowledge, there is no consensus on what constitutes a good musical performance. Clark (2005) and Lewis (*Other worlds: Towards an ontology of improvisation,* forthcoming) emphasized differences across musical cultures, whose knowledge is required to be able to evaluate music. We opted for open-ended questions to let participants express their quality judgments in their own words.

We used a mixed-method approach combining multiple-choice questions with Likert scales and open questions in the design of the questionnaires. The *recording* [Q.1] and *listening* [Q.3] session questionnaires were very similar. The musicians were first asked to select their favorite take out of the three takes and to justify their choice [Q.1.1 & Q.3.1]. Then, they rated the efficiency of the experimental condition on a five-point Likert scale from very inefficient to very efficient [Q.1.2 & Q.3.2]. In the *recording session questionnaire*,

we asked the musicians about their experience while recording in the experimental condition [Q.1.3]. In the *listening session questionnaire*, we asked them to describe the evolution of the three takes [Q.3.3]. In the *end session questionnaires*, we asked the musicians which experimental condition they felt was the most efficient and why [Q.2.2 & Q.4.1]. For the *final recording session questionnaire* only, we also asked them which condition they preferred [Q.2.1], assuming that efficiency and comfort do not necessarily go together. Surprisingly, at the listening sessions, most musicians did not remember which experimental condition corresponded to which composition; presumably, this reduces bias in their answers. Therefore, we asked them to answer the *final listening session questionnaire* [Q.4.1] with the name of the composition instead of the name of the condition.

In the *expert evaluation questionnaire* [Q5], experts were first asked to comment each take of the same musical composition [Q.5.1]. Similarly to *listening session questionnaire* [Q.3], they were then asked to describe the evolution of the three takes [Q.5.2], to select their favorite one and to justify their choice [Q5.3]. It should be noted that the first author did not remember which experimental condition correspond to which composition during the expert evaluation, except for two compositions that corresponded to striking moments in the studio. Presumably, this reduces bias in her answers.

7.2.5 Analysis

We compared the durations of conversations among musicians and/or between the producer and the musicians across experimental conditions, across ensembles and across stages of the session (between take 1 and take 2 vs. between take 2 and take 3). We then analyzed the content of conversations to identify similarities among producers.

We used chi-square tests to compare the answer distribution of the multiple-choice questions and we measured consistency of the musicians' answers between the recording and the listening sessions. We analyzed the ratings on the Likert-scale for efficiency using an ANOVA, after converting the ordinal scale to an interval level of measurement (Very inefficient = 1; Not efficient = 2; Neutral = 3; Efficient = 4; and Very efficient = 5).

Furthermore, to analyze the open questions, we extracted phrasings from the verbal data and identified emergent concepts according to the constant comparison technique of Grounded Theory (Glaser & Strauss, 1967). The music criteria extracted from the preference descriptions were compared with Bergee's evaluation forms and May's IJEM. We analyzed the data from the expert listeners separately and then, we compared the results with the musicians' answers.

7.3 Results

7.3.1 Conversation amongst musicians and with producers between recorded takes

Over all ensembles and experimental conditions, conversations between takes lasted 3'36 on average ($SD = 4'36$). A One-Way ANOVA showed a tendency ($F(3, 29) = 2.59$, $p = .07$) for shorter conversation in condition N] No producer & No self-evaluation ($Mean_N = 1'42$, $SD_N = 0'54$) as opposed to the other conditions ($Mean_S = 5'00$, $SD_S = 2'48$; $Mean_P = 6'18$, $SD_P = 4'42$; $Mean_{PS} = 4'36$, $SD_{PS} = 3'06$). There were no significant differences in conversation duration after the first and second takes when collapsing over all conditions and ensembles ($F(1, 31) = 1.31$, $p = .26$), and no significant differences across ensembles ($F(4, 28) = 2.01$, $p = .12$).

Conversations took place either in the control room (conditions S and PS, with self-evaluation after listening to the take) or in the studio (conditions N and P, without self-evaluation). When staying in the studio, musicians could play on their instrument to try suggestions or to rehearse challenging parts, resulting in more interactive but often one-on-one discussions. When in the control room, musicians could only sing musical parts but the discussion typically involved the entire ensemble.

Under condition N] No producer & No self-evaluation, musicians moved on to the next take after a very quick summary of the composition structure. Under condition S] No producer & Self-evaluation, musicians spend more time commenting on the takes but they

did not often remain focused on the recorded music, and when they did, they often did not reach a consensus. On the other hand for conditions P and PS with a producer, musicians focused on the music. In addition, the producer ensured that every member of the ensemble had a chance to express his/her ideas. As a result, musicians found a solution as a group to address every concern raised by the producer or one of the musicians in these conditions. This indicates that the producer acts as a mediator.

We analyzed producers' comments to determine common features in the feedback provided, and in the way they provided it. Producers started the conversation by asking musicians how they felt about their performance. They had specific comments, prioritized suggestions for improvement after the first take, provided detailed feedback on these improvements after the second take and reiterated changes that were not made. While all producers respected the rule of "qualifying the musical performance instead of qualifying the person" (Chapter 6), they expressed judgments on compositional and expression aspects. At the end of each discussion, they always recapitulated the discussed points.

7.3.2 Take preference [Q.1.1, Q.3.1 and Q.5.3]

After recording the takes and after listening to them a few weeks later, musicians were asked to select their favorite take out of the three and justify their preference. The two experts did the same a few months after the field experiment. The distribution of take preference by experimental condition is presented in Figure 7.4 for the *recording session questionnaire* [Q.1.1] (left graph), the *listening session questionnaire* [Q.3.1] (medium graph), and the *expert evaluation questionnaire* [Q.5.3] (right graph). Over all experimental conditions, the musicians chose the 3rd take predominantly after both the recording (65 % of the times) and the listening (64 %) sessions, as opposed to the 2nd take (29 % after recording and 31 % after listening) or the 1st take (6 % after recording and 5 % after listening). However, experts chose the 1st take predominantly (46 % of the times), then the 3rd take (32 %) and last the 2nd take (22 %).

Musicians complained about the fixed number of takes as part of the experiment constraints. Some would have liked to record a fourth one. The choice of three takes instead

of four was determined by time constraints. But it would be interesting to extend this procedure to longer sessions. In addition, some musicians were surprised that they preferred the 2nd or the 3rd take rather the 1st one. Before participating, they assumed that the 1st take would be the most spontaneous and thus the most interesting one, which corresponded to the preferences of the experts. It should be noted that the choice of the 3rd take may be influenced by the order of the takes' presentation, as in both the recording and the listening sessions, the 3rd take was the last one. However, from the *listening session questionnaire* [Q.3.1] answers (see medium graph on Figure 7.4), a chi-square test with Yates' correction (one frequency less than five) revealed a significant difference in take preference distribution between the conditions without a producer and the conditions with a producer (χ^2 (2, 91) = 7.20, p = .03). While musicians almost equally selected take 2 or take 3 for the conditions without a producer (N and S), they significantly preferred take 3 for the conditions with a producer (P and PS), which suggest that the producers' comments help performers to improve throughout the entire session.

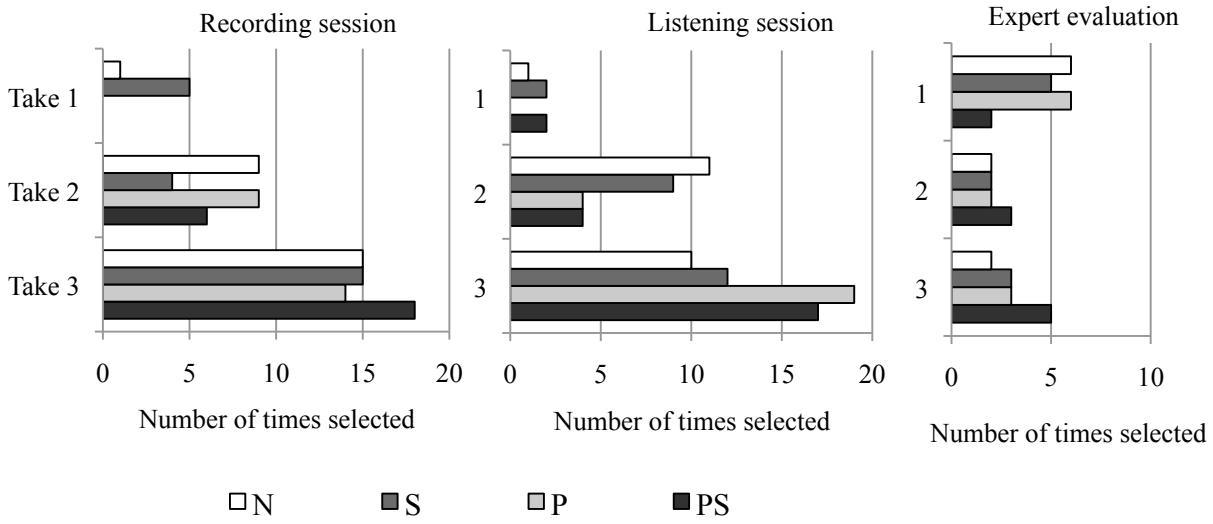

Figure 7.4 Take preference in the recording session [Q.1.1] (left graph, 25 musicians), in the listening session a few weeks later [Q.3.1] (medium graph, 22 musicians), and by the experts [Q.5.3] (right graph, 2 experts).

We compared the number of times musicians selected the same take in the recording and the listening sessions. The consistency rate (at the individual level) for each condition were:

52 % for condition N] No producer & No self-evaluation; 77 % for condition S] No producer & Self-evaluation; 71 % for condition P] Producer & No self-evaluation; 82 % for condition PS] Producer & Self-evaluation. These differences illustrate that both self-evaluation and producer's comments enhance musicians' objectivity in the recording session.

Free-format verbal descriptors used to describe preference were grouped into eight emerging music criteria, namely VIBE (79 occurrences), COHESION (76), NATURAL (71), SOLOS (61), TIME (48), TECHNIQUE (43), ATTENTION (38) and CREATIVE (31). The coding scheme is available in Appendix G. The analysis was validated by a musicologist and by one of the musicians. Figure 7.5 presents the distribution of music criteria extracted from the answers of the *recording session questionnaire* [Q.1.1], the *listening session questionnaire* [Q.3.1], and the *expert evaluation questionnaire* [Q.5.3]. All eight criteria were used by participants in the three situations to describe their favorite take. It should be noted however that with the exception of the two experts, all participants studied or taught in the same program. While the criteria may not be representative of musicians in other programs, we focus our analysis on the comparison of answers collected in the different experimental conditions (rather than on the criteria used).

From participants' verbal descriptions of their favorite take, we identified eight music criteria that are similar to May's IJIEM (2003): Technical Facility refers to TECHNIQUE, Rhythm/Time Feel to TIME, Melodic/Rhythmic Development to COHESION, Creativity to CREATIVE, and Style and Expression can be included in VIBE (the criterion Harmony did not come out). Regarding Bergee's evaluation forms (1997), the different technical criteria specific to instruments were all included in TECHNIQUE, Tone and Musical Effect can be associated with VIBE, but the criterion Interpretation did not come out our participants' descriptions.

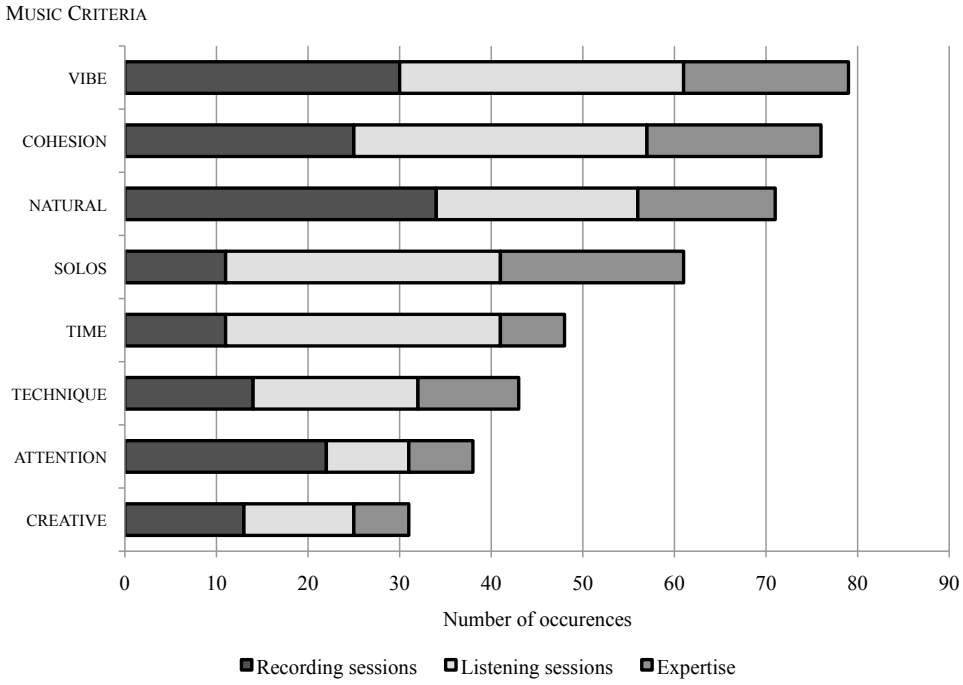

Figure 7.5 Distribution of music criteria used to describe the best take in the recording sessions [Q.1.1], in the listening sessions [Q.3.1], and by the experts [Q.5.3] (N=27, 447 occurrences in total).

In the answers to the recording session questionnaire [Q.1.1], the criterion NATURAL was strongly expressed for the condition S] No producer & Self-evaluation, which suggests that self-evaluation after listening to the takes without a record producer makes musicians more aware of the authenticity of their playing. However, as the phenomenon disappears in the answers of the listening session questionnaire [Q.3.1], we cannot conclude that self-evaluation without an external producer enhanced genuine playing. Subsequently, we only present in Figure 7.6 the distribution of music criteria used in the listening sessions [Q.3.1] and expert evaluation [Q.5.3] as a function of the experimental condition.

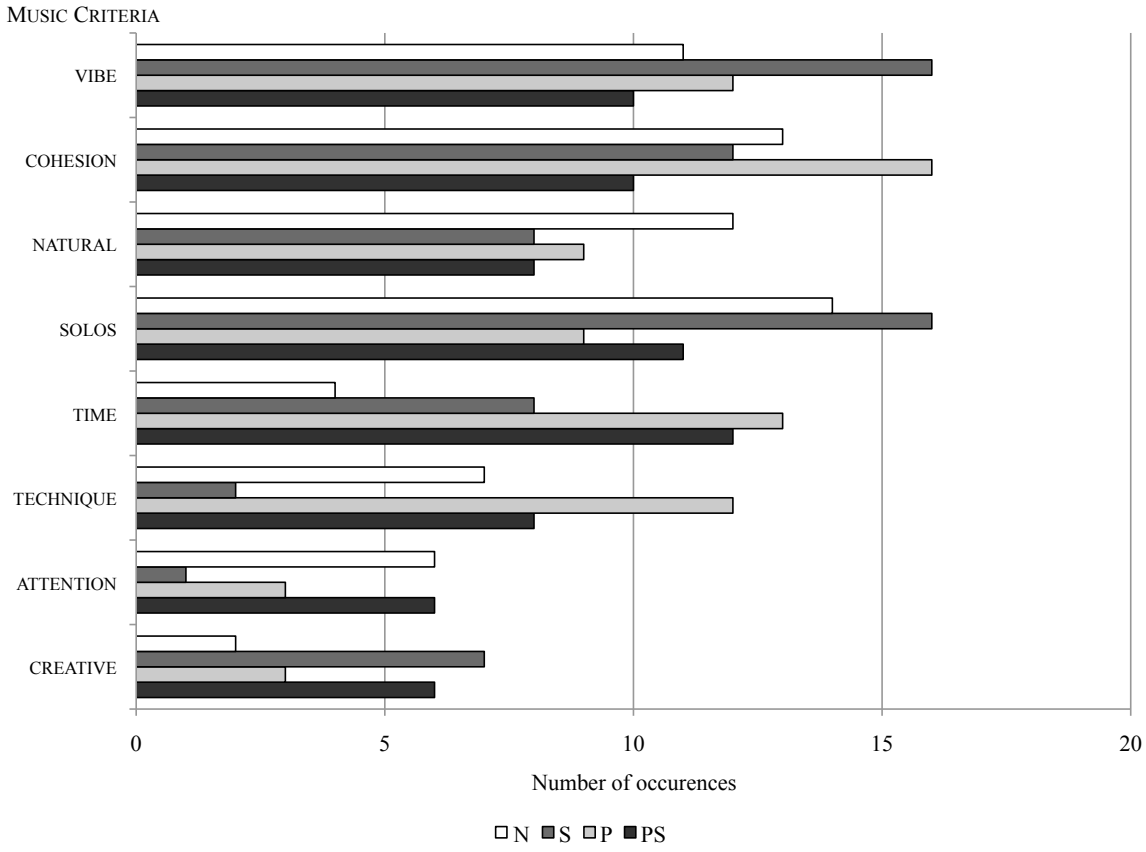

Figure 7.6 Distribution of music criteria used to describe the best take in the listening sessions [Q.3.1] and by the experts [Q.5.3] as a function of the experimental condition, collapsing over all musicians and experts (N=27, 287 occurrences).

In the listening sessions and expert evaluation, the criterion VIBE was primarily mentioned for condition S] No producer & Self-evaluation, which suggests that self-evaluation after listening to the takes without comment from an external producer may constitute an ideal situation to get the best vibe out of the performance. The criterion NATURAL was primarily mentioned for condition N] No producer & No self-evaluation, which suggests that absence of feedback allows more authentic playing. Similarly, the criterion SOLOS was mentioned more often for the conditions without a producer (N and S) than for the conditions with a producer (P and PS), which suggests that the presence of a producer restrained freedom during improvisation. However, the criteria COHESION and TECHNIQUE

were primarily mentioned for condition P] Producer & No self-evaluation, which suggests that comments from an external producer without self-evaluation enhances musicians' ability to play a solid overall take. Furthermore, the criteria TIME was mentioned more often for the conditions with a producer (P and PS) than for the conditions without a producer (N and S), which suggests that the presence of a producer helps musicians find a good tempo. We also observed that the criteria TECHNIQUE and ATTENTION were barely mentioned for condition S] No producer & Self-evaluation, which suggests that this condition makes musicians lose their concentration. Finally, the criterion CREATIVE was mentioned more often for conditions with self-evaluation (S and PS) than for conditions without self-evaluation (N and P), which suggests that self-evaluation enhances creativity.

7.3.3 Efficiency

A two-by-four factorial ANOVA revealed no significant difference between the efficiency ratings at the recording sessions [Q.1.2] and at the listening sessions [Q.3.2] ($F(1, 179) = .09$, $p = .76$). Subsequently, the ANOVA for the recording sessions ($F(3, 92) = 3.6$, $p = .02$) revealed that condition PS] Producer & Self-evaluation was perceived as more efficient ($Mean_{PS} = 4.2$ - between Efficient and Very efficient, $SD_{PS} = 1.0$) than condition N] No Producer & No self-evaluation ($Mean_N = 3.3$ - between Neutral and Efficient, $SD_N = 1.1$). There was no significant difference between efficiency ratings of the four conditions during the listening sessions ($F(3, 87) = .5$, $p = .68$).

In the *recording session questionnaire* [Q.1.3], musicians were asked how they felt recording under a specific experimental condition. They reported that both self-evaluation and producer's comments gave common grounds amongst ensemble members but made them too self-conscious. While self-evaluation helped them fix errors and keep the best parts, they felt that listening in the control room was a waste of time responsible for their loss of focus. Furthermore, musicians mentioned that the producer made them play better and provided helpful comments to shape the tune. However, they specified that they could find it difficult to understand their comments and to integrate the suggested changes.

Figure 7.7 presents the results of the *listening session questionnaire* [Q.3.3] and the *expert evaluation questionnaire* [Q.5.2] on the evolution of the three takes as a function of experimental conditions. Over all conditions, participants mainly reported improvement throughout the three takes. We observed that this improvement was predominant for condition P] Producer & No self-evaluation, which suggests that the presence of a producer without listening between takes enhances progression throughout the three takes. For the two conditions with self-evaluation (S and PS), participants often reported an improvement between the first and the second takes, and not between the second and the third takes. Moreover, no participant mentioned that takes got worse for condition S] No producer & Self-evaluation and only two mentioned that takes got worse for condition PS] Producer & Self-evaluation. Together these results suggest that self-evaluation enhances improvement between the first two takes but may have a negative impact after.

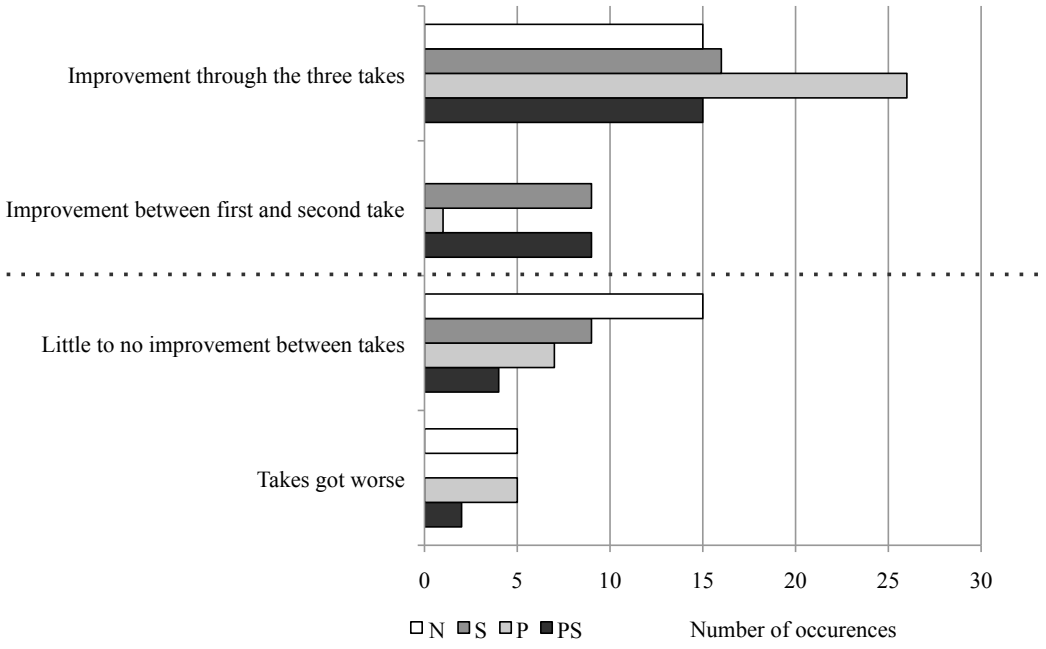

Figure 7.7 Takes evolution depending on the experimental condition [Q.3.3 & Q.5.2] collapsing over all musicians and experts (N= 27).

Figure 7.8 presents the results of the *final recording* [Q.2.1 & Q.2.2] and the *final listening* [Q.4.1] *session questionnaires*. The musicians largely preferred condition PS] Producer

& Self-evaluation and felt that it was the most efficient. During recording sessions, the conditions with a producer (P and PS) were perceived as more efficient than the conditions without a producer (N and S), while during listening sessions a few weeks later, the conditions with self-evaluation (S and PS) were perceived as more efficient than the conditions without self-evaluation (N and P).

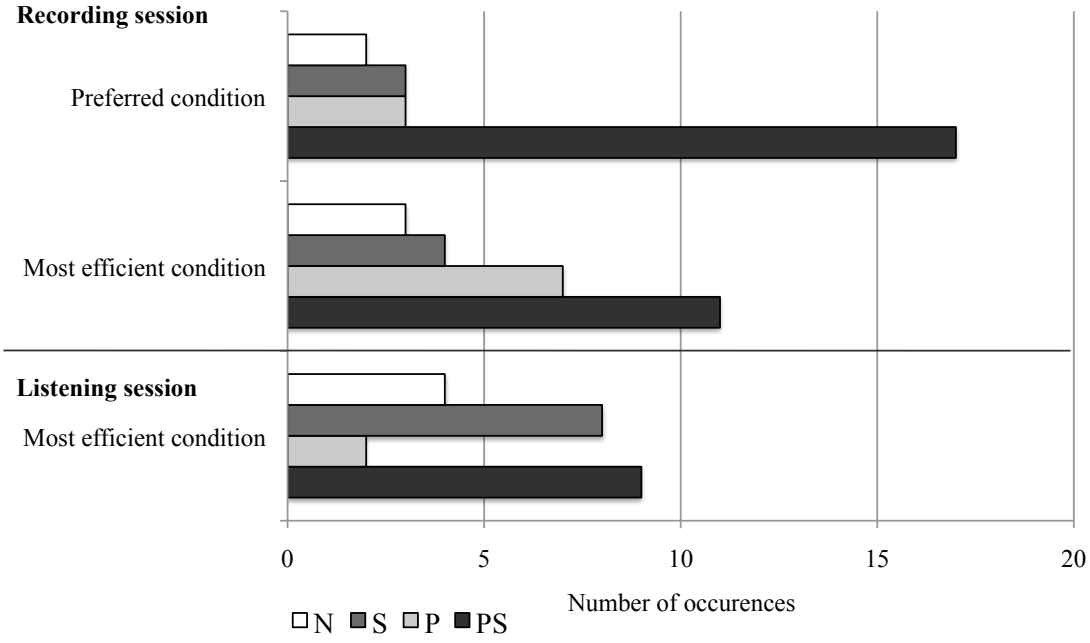

Figure 7.8 Perceived preference and efficiency of the different conditions [Q.2.1, Q.2.2 & Q.4.1] for all musicians (N=25).

7.4 Discussion

Findings from this experiment demonstrated that both record producers' comments and performers' self-evaluation positively impacted on musicians' performance and experience while recording in the studio. Both types of feedback improved the consistency of participants' take preference between recording and listening to the takes a few weeks later,

thus both types of feedback enhanced objectivity during sessions. Musicians also reported that both types of feedback gave the ensemble a common ground, which together with objectivity are necessarily to improve from one take to another during a recording session.

We found that getting comments from an external professional helped musicians technically improve throughout the takes with more focus. The producer in the control room listens to the end-result of the recording, which is different from what musicians hear while performing in the studio (Chapter 6). By listening, record producers play a comparable role with an actor director who observes actors on stage from the audience perspective in order to refine the play production (Proust, 2006).

We found that self-evaluation after listening to the takes in the control room enhanced creativity and helped musicians improve between the first and the second take, which is in keeping with the first author's observation from her studio experience that having the musicians listen to the first take in the control room usually results in considerable improvement: the performers understand what they need to change without the need for an external person to tell them. It also prevents producers from humiliating an individual within the ensemble if something unexpected is happening (Chapter 6). However, in practice, musicians often refuse to come and listen to the takes until they need a break after three or four takes. But then when they finally come and listen, they no longer have the energy needed to record another good take. Based on our findings, musicians involved in *Do It Yourself* productions should evaluate their first take after listening to it.

Findings also showed that producers' comments and self-evaluation could have negative impacts on the music quality of the recorded takes. Indeed, both types of feedback made performers more self-conscious, which may have inhibited them from playing as genuinely as they would have if they were going on from one take to another without getting any feedback. Specifically, listening between takes in the control room could be perceived as a waste of time that makes musicians lose focus, while comments from an external producer may have restrained the vibe of the global performance and the inspiration of the solos. This may however have been due to the experimental nature of the situation – producers "forced" to give feedback in the Producer conditions. In a real life situation, producers would not necessarily provide comments after every take (Chapter 5).

Together, our results demonstrated a great benefit when performers have a discussion with an external producer after self-evaluating the first take. Then, depending on the need, the producer may choose to maintain the focus and guide the musicians throughout the entire session, or to let them move on to another take without discussion.

Results for take preferences by expert listeners pretty much differed from take preferences by musicians at the listening sessions: overall experimental conditions the external musician expert primarily chose the first take while musicians primarily chose the third take. This difference in the results illustrates the importance of designing a field experiment the closest from real life as possible. Indeed the preference for the first take is a common belief and because the musicians knew their choice would impact which take would be mixed for their demo, bias in their choice was minimized. Nevertheless, this difference can also be explained by the tendency of musicians to pick up the best technical take, often balanced by producers or external listeners who usually favor the most musical one. It should be noted that when musicians are not enough prepared for the recording sessions, the best technical take tends to occur in the last takes, and when musicians do not have a lot of studio experience, the best musical take tends to occur in the early takes (which explains the common belief).

In the studio, musicians preferred the condition with a combination of the two types of feedback, being able to discuss with the record producer after listening to the recorded result through the speakers. None of them complained about an external person being too intrusive, even though most musicians did not know the producer beforehand and despite the fact that producers had to provide comments after each take due to the design of the experiment. While producers remained very respectful in the way they phrased their judgments, they asked for major changes such as reshaping the compositions, the arrangements and the tempi. In a previous study (Chapter 3), musicians reported the fear of being controlled by an external person and emphasized the importance of producers' strong interpersonal and communication skills. In the present study, the producers identified problems, introduced their own ideas for discussion with the entire ensemble and mediated between the different members to reach a consensual solution. This strategy proved to be productive and well received by musicians. It should be noted that discussions in the studio

allowed musicians to try suggestions on their instruments while discussions in the control room were more focus.

It should be noted that creative headphone mixes could enhance the quality of music performance while recording in the studio. In this view, record producer and engineer Alan Silverman reported, "I always focused on my cue mixes over all others, and tried to be sensitive to how adjustments in the cue balance effected the emotional content of the take in progress"[2]. Using a different technique, record producer and engineer Patrick Sigwalt send to the performers' headphones the mix he has made for himself in the control room, thus everybody works on the same reference[3]. In our experiment, we did not test the effect of headphones mixes on music performance as we used a system available in the James Dolan Studio that allowed performers to make their own headphone mix themselves. It would be very interesting to evaluate the techniques mentioned above in future research.

7.5 Conclusion

In keeping with Larsen (2008), our findings highlighted the benefit of conducting field experiments to investigate artistic creation processes. To our knowledge, the only studio experiment thus far was conducted by King (2008) to test a learning technology interface of sound recording. Furthermore, we extended the concept of evaluation form for music performance in music education research.

This experiment is part of a larger research project that aims at documenting studio professionals' tacit knowledge for musical recordings in the context of recent change in the organization of the recording industry. Our findings provided interesting insights on the effect of the interaction between an ensemble and an external professional and thus complement our investigation of world-renowned professionals' best practices to draw the best possible performance out of the artists. Future research will address the preparation

[2]Private conversation. Confirmed by email on May 2012.
[3]Interview. Confirmed by email on May 2012.

of recording sessions, both for studio professionals and musicians, in order to optimize the budget constraints and the challenges of the current context of the recording industry.

7.6 Acknowledgements

The experiment was carried out during a research residency in the Fall of 2010 hosted at the Department of Music and Performing Arts Professions of the Steinhardt School of Culture, Education and Human Development of New York University, supervised by the Associate Director of the Music Technology program Prof. Agnieszka Roginska and coordinated by Andy Milne from the Jazz Studies Faculty. This residency was supported by CIRMMT Inter-Centre Research Exchange Funding (Montréal, Qc, Canada). The first author is also funded by the Fonds Québecois pour la Recherche sur la Société et la Culture (FQRSC). We would like to thank Prof. Agnieszka Roginska, Andy Milne, Paul Geluso and Dr. David Schroeder for making this study possible, as well as all the musicians and sound engineers who participated in this experiment for giving their time, competences and talent. We would also like to thank Tifanie Bouchara, Abigail Kniffin, Maryse Lavoie, Michèle Rémy and David Weigl for their comments on earlier drafts.

Chapter 8

Conclusion

8.1 Summary of the main findings

Findings together addressed the five research questions:

- Q1. What are the expectations of musicians when collaborating with a sound engineer and/or a music producer for their recording project? Musicians expect studio professionals to exhibit strong inter-personal and communication skills and to take into consideration the aesthetics of their project (Chapters 3 & 4).
- Q2. How can pre-production meetings improve recording sound quality? The sound quality of musical recording can be improved through communication in pre-production meetings between the musicians and the sound engineer(s) about the main features of the music to be recorded (Chapter 4).
- Q3. How do recent technological advances impact recording practices? Recent technological evolutions have negatively impacted on recording budgets and working con-

ditions but have not yet influenced studio professionals' perceived roles and recording aesthetics (Chapters 3, 5 & 6)

- Q4. What are the best practices of world-renowned record producers for the artistic direction of musical recordings? Record producers adapt their level of artistic involvement during recording sessions from light coaching to deeper collaboration with the artists according to the musicians' preparation, requests and personality, as well as the size of the ensemble (Chapter 6).

- Q5. What is the effect of record producer's feedback on performance in the studio, as opposed to musicians relying exclusively on self-evaluation? Record producers' comments during recording sessions help musicians technically improve throughout the session, while self-evaluation after listening to the takes in the control room enhances creativity (Chapter 7).

More specifically, in the questionnaire study (Chapter 3), a consensus was found among respondents regarding the distinct roles of music producers and sound engineers that corresponded to the descriptions in the literature. Young and talented musicians and sound engineers perceive producers as artistic directors providing objective feedback according to the music aesthetics. They reported that the sound engineers' role is to make sound choices, also by taking into consideration the music aesthetics. To conduct recording sessions, both producers and engineers are expected to exhibit strong communication and interpersonal skills, such as knowing how to create a good atmosphere for performance in the studio. However, a somewhat paradoxical evaluation was identified regarding producers' artistic involvement: musicians' desire to collaborate with a creative and involved producer vs. musicians' fear to be controlled by an external person.

In the first field experiment (Chapter 4), a method that aims to meet the musicians' expectations regarding sound quality was successfully validated. In pre-production meetings bringing together the ensemble and the sound engineer(s), musicians were encouraged to describe their music and to convey their expectations for sound quality without using technical and specialized terms. Sound engineers were invited to listen to the ensemble in rehearsal or concert before the pre-production meeting and during the meeting, they could ask for any clarification needed to define sound objectives. Positive results questioned the

common perception that sound quality is an exclusively subjective factor and went against a common belief in the sound engineering community that musicians cannot make sound quality criteria explicit.

Findings from the first part of the world-renowned record producers' interviews (Chapter 5) showed that recent changes in the recording industry did not influence their main aesthetic approaches to recording. The collapse of record companies forced them to adjust to tighter budgets and outsourced facilities. On the other hand, it has allowed them to work on a wider variety of projects than they did in the past. They reported that digital technologies enable endless possibilities to work from anywhere and at a reasonable cost for independent productions. Reflecting upon the future of musical recording, they foresaw live audio and video captures instead of audio-only well-refined studio creations.

The second part of the interviews (Chapter 6) focused on record producers' best practices and tacit knowledge to conduct recording sessions. A model was derived from the content and discourse analyses to highlight four levels of producers' artistic involvement: 0) observing the recording situation and adapting their working approach according to the aesthetic context; 1) intermediating between the artists and their future audience by providing an extra set of ears on the project; 2) adapting their language when providing feedback on technical issues of the performance; 3) managing by guiding and giving direction between takes; and 4) deeply collaborating with artists to get the best possible result, which implies coping with artists' sensitivities. In keeping with findings from the questionnaire study (Chapter 3), regardless of the level of artistic involvement, record producers always create a good atmosphere for performance and allow trust and honesty in the studio by convincing the artists that they understand their music and that the collaborative goal is to produce together a high-quality recording.

According to findings from the second field experiment (Chapter 7), musicians' preferred situation was to be able to discuss with the record producer after listening to the recorded result in the control room, and they have not complained about an external person being too intrusive. Both record producers' comments and musicians' self-evaluation give the ensemble a common ground and increase objectivity during recording sessions. Specifically, getting feedback from an external producer helps musicians focus throughout the session

and improve technical aspects, but it may restrain the authenticity and vibe of the performance. Listening between takes in the control room enhances creativity and allows for improvements after the first take, but it makes musicians lose focus if they listen after each take.

8.2 Contributions

8.2.1 Methodological contributions

The combination of theoretical investigations with field experiments provided a deep understanding of studio professionals' contribution to the quality of musical recording from different points of view. While abundant verbal descriptions from surveys and interviews allowed us to identify the subtleties of tacit knowledge developed over the years to conduct recording sessions, results from the field experiments allowed us to derive practical implications that musicians and studio professionals can apply in the studio. This multi-method approach validated Larsen's statement (2008) about the need to undertake "multi-side" observations to study media practices in the present days. Studio experiments proposed a new methodology to explore artistic processes in cultural studies. Moreover, the use of both content and discourse analyses extended existing methods to examine best practices in knowledge management.

Research questions were first derived from the professional experience of the author. The depth of the data and analysis from the producer's interviews (Chapter 6) confirmed that researchers' professional experience could enhance sensitivity in qualitative research, meaning "being able to present the view of participants and taking the role of the other through immersion in data" (Corbin & Strauss, 2008). Because sensitivity stands in contrast to objectivity, the author collaborated with researchers from linguistics and musicology who provided a "fresh look" on the data.

8.2.2 Limitations

The first field experiment (Chapter 4) initially aimed to investigate a method to improve both the sound and artistic quality of musical recording with pre-production meetings. While we could recruit four sound engineers, we were not able to recruit additional producers so the author was the only artistic director during all the recording sessions. Given this limitation, we were not able to validate the results concerning the artistic aspects of the pre-production method and focused the report on the sound quality aspect, resulting in a shorter chapter. Furthermore, musicians involved in this field experiment left The Banff Centre before the sound engineers could mix their recording. As a result only a small percentage of musicians sent back the post-session questionnaire. Nevertheless, the author chose to present the results concerning the sound quality aspects, as they provided interesting insights for future research on the topics of recording preparation and organization.

The second field experiment (Chapter 7) presented fewer methodological issues than the first one: we were able to recruit three additional record producers so the author only produced two sessions. In addition, response bias was minimized by the fact that most questions had a direct impact on the result of the musicians' final demo (e.g. take preference). The expert evaluation was very demanding (long hours of listening) so only one external listener participated in addition of the author. Therefore the expert evaluation cannot be analyzed or compared statistically to the musicians' answers.

In general, although our investigation of studio professionals' best practices was carried out without restriction to specific musical genres, geographical or social contexts, participants' socio-cultural backgrounds were not always representative of the diversity of the population:

• The world-renowned record producers (Chapters 5 & 6) covered a wide range of musical genres but jazz was predominant for the questionnaire study (Chapter 3) and the two field experiments (Chapters 4 & 7). This was not a fortuitous choice, as jazz was born with the invention of sound reproduction and it lies at the intersection between written and oral music, and between composition and improvisation. Jazz strongly influences the music that comes out and it has given birth to many musical genres, e.g. Soul, Pop, Rock, and Rhythm

and Blues. Furthermore, many jazz musicians were trained in classical or traditional music, and they make their living recording for pop artists and film scoring, thus their musical knowledge mixes different musical genres together.

• While participants from The Banff Centre (Chapters 3 & 4) represented nine different countries (from North and South America, Europe, Asia, and Oceania), the world-renowned record producers (Chapters 5 & 6) primarily worked Europe or North America, and all participants from NYU Steinhardt (Chapter 7) were from North America. Therefore our findings are mainly trustworthy for European and North American cultures.

• Regarding social contexts, The Banff Centre (Chapters 3 & 4) and NYU Steinhardt (Chapter 7) are more likely to attract musicians and sound engineers coming out of institutions than self-taught professionals. Furthermore, the record producers (Chapters 5 & 6) have a worldwide recognition and thus are likely to charge significant fees to the artists they work with. Therefore, our findings are not representing a wide range of social contexts.

While we examined studio practices from different expertise (young musicians, young sound engineers, and experienced record producers), we focused on studio professionals and thus did not investigate the perspectives of world-renowned musicians to compare with the perspectives of world-renowned record producers. Furthermore, our multi-method approach could have included studio observations. The author privileged surveys, interviews and experiments as her training and professional experience provided her with a good knowledge of the field and motivated her to focus on specific research questions.

8.2.3 Theoretical contributions

Through an interdisciplinary review of literature on studio practices, we were able to document the technological and economic evolutions of the recording context since the introduction of sound reproduction. This synthesis of different bodies of literature combined with an in-depth investigation of studio practices contributed to create new knowledge in the under-explored field of music recording. Findings about the collaborative aspect of recording sessions provided insight on communication processes between different stakeholders

(musicians, sound engineers, producers) in an artistic context. Record producers' best practices to conduct recording sessions were compared with actor directors' best practices for play production (Proust, 2006). Furthermore, the proposed model of record producers' artistic involvement during recording sessions (Chapter 6) extends the concept of intermediary between production and consumption in cultural domains (Bourdieu, 1984; Hennion, 1989), and the definition of mediating roles in management (Jyrämä, 2008). Similarities observed with other cultural and production fields suggest the applicability of our involvement model to other managerial contexts.

While communication and interpersonal skills to interact with musicians and to draw out the best performance were largely discussed in the various studies of this thesis, musical and technical knowledge have received less attention because they are not tacit and have been taught in educational programs for a long time. This investigation was undertaken at a time when traditional recording studios are closing and thus studio practices are not transferred on the job through an apprenticeship model any longer. Consequently the number of institution programs teaching sound engineering is increasing, but these programs focus on technical skills, specifically on the use of computer-based tools (Porcello, 2004). Ironically in North America, the best-equipped recording studios in the present day are in academia for learning and research purposes. However, only a few schools[1] propose to teach the profession of "Tonmeister" (Borwick, 1973), which literally means "master of sound" (Horning, 2004) and which takes into consideration the management part of artistic direction for musical recordings. Therefore, publication on best practices for artistic direction will help this tacit knowledge be transferred to wider communities.

8.2.4 Implications for studio practices

Participants from various studies agreed that the best recording situation consists in an efficient artistic collaboration between musicians and studio professionals. This situation requires 1) musicians to hire a record producer from the first stage of the production, 2) record producers and/or sound engineers to establish a trust relationship with the artists

[1]The Music/Sound recording program of Conservatoire National Supérieur de Paris (from which the author graduated) is one of them.

in pre-production meetings, and 3) record producers to adapt their language and provide objective comments according to the music aesthetics while conducting recording sessions.

This thesis was undertaken at a time when budget constraints reduce the collaborative aspect of recording. Outcomes from the two field experiments (Chapters 4 & 7) can help musicians optimize their recording sessions in *Do It Yourself* productions (Strachan, 2007): 1) before the recording musicians should invite the sound engineer to a rehearsal and/or a concert and then they should describe for her/him the main features of their music and their expectations for sound quality, 2) during a recording session musicians are encouraged to listen to the first take and then discuss their evaluation among the ensemble before recording a second take, and 3) musicians could bring an external listener to choose the recorded take and this choice should occur a few weeks after the recording session to increase objectivity.

8.3 Future research

Future research would be needed to complement this investigation of studio practices with the perspectives of world-renowned musicians about *Do It Yourself* productions as compared with knowledgeable producer collaboration. Furthermore, the producers' description of the two main recording aesthetics (Chapter 5), i.e. the *Tonmeister concept* and *Using the studio as a musical instrument*, calls for a research project that would explain how studio professionals use microphones and recording technology to meet the requirements of these aesthetics.

The guide for record producers' interviews addressed the preparation of recording sessions in order to optimize the budget constraints and the challenges of the current context of the recording industry. However, organization and preparation were not analyzed in depth in this dissertation and the outcomes of the interviews on these topics could be compared with the results from the survey (Chapter 3) and the first field experiment (Chapter 4).

The need to understand music aesthetics to conduct recording sessions was primarily addressed in all studies, which suggests that it constitutes a main issue in the current

context of recording. It makes sense, as studio professionals cannot afford to focus on a typical music genre as they could in the past. Moreover the boundaries of musical genres tend to become unclear as the spread of music through the Internet keeps generating new music aesthetics. Therefore, future research would further observe how studio professionals adapt their recording approach to the main features of a musical project in terms of sound quality and artistic direction. To take into consideration several music aesthetics, future research is needed to extend this investigation of studio practices to different social contexts and outside the boundaries of European and North American production.

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Appendices

Appendix A

Questionnaires sent to the participants of the International Jazz Workshop at The Banff Centre (Chapter 3)

Musicians' questionnaire

- Q1. In your opinion, what would be the role of an ideal producer during a recording session?
- Q2. In your opinion, what would be the role of an ideal sound engineer during a recording session?
- Q3. Think about positive experience(s) you had working in studio. (Please describe the context (e.g. CD production, demos) and the musical genre)
  - a. If applicable, describe your interaction with the producer during the session(s):
  - b. If applicable, describe your interaction with the sound engineer during the session(s):
- Q4. Think about negative experience(s) you had working in studio. (Please describe the context (e.g. CD production, demos) and the musical genre)

  - a. If applicable, describe your interaction with the producer during the session(s):
  - b. If applicable, describe your interaction with the sound engineer during the session(s):

- Q5. How do you prepare for a recording session? Does it differ from your preparation for a concert? If so, describe the difference.

Sound engineers' questionnaire

- Q1. In your opinion, what would be the role of an ideal producer during a recording session?
- Q2. In your opinion, what would be the role of an ideal sound engineer during a recording session?
- Q3. Think about positive experience(s) you had working as a sound engineer in studio. (Please describe the context (e.g. CD production, demos) and the musical genre)
  - a. If applicable, describe your interaction with the producer during the session(s):
  - b. If applicable, describe your interaction with the musicians during the session(s):
- Q4. Think about negative experience(s) you had working as a sound engineer in studio. (Please describe the context (e.g. CD production, demos) and the musical genre)
  - a. If applicable, describe your interaction with the producer during the session(s):
  - b. If applicable, describe your interaction with the musician(s) during the session(s):
- Q5. How do you prepare for a recording session?

Appendix B

Questionnaires for the field experiment at The Banff Centre (Chapter 4)

Before production, question for musicians with the sound-engineer present:

- Please describe the musical genre of the music you are recording here?
- How long have you been playing together?
- Did you prepare for this session?
  - If so, how?
  - For how long?
  - Individually or as a group? (role/contribution of each member)
- For this session, do you have a particular kind of sound in mind?
  - For example, did you think about the possibility separation, the amount of reverb, or the stereo image.
  - Is there a specific example of sound that you like and that would be appropriate for your music in this session? (It could refer to an album, an artist, a style, a label etc...)

- After recording, how do you evaluate the music quality of your takes?
  - Give specific criteria that you use to compare various takes. (It could be different for each tune/piece/song.)
- For this specific session, what do you expect from the producer?

After the production, questions for musicians:

- In general, are you satisfied with the recording sessions?
- Specifically, are you satisfied with the music? Justify
  - With the working environment?
  - With the way the producer ran the session?
  - With the timing of the session?
  - With the sound quality?
- In your opinion, does the sound correspond to the sound you described before the session? (If not, to what extent?)
- Have your expectations for sound quality evolved throughout or after the session? If so, explain how, why, illustrate with a concrete example?
- The producer gave you feedback and/or advice after each takes. Honestly, what did you think of these comments?
  - Were they useful?
  - Were they intrusive?
  - Too intrusive?
  - Were you overwhelmed with comments?
  - Did you integrate them in the subsequent tasks?
  - Do you feel that the producer has a firm grasp of your music?
    - Explain?
    - Certain aspects of the music specifically (e.g. knowledge of the musical genre, of specific instruments)

If you have any comments on the recording sessions:

On the questions:

Your insight is very useful for us.

After the production, questions for sound-engineers:

- In general, are you satisfied with the recording sessions?
- Specifically, are you satisfied with the music? (Justify)
  - With the way the producer ran the session?
  - With the timing of the session?
  - With the sound quality?
- In your opinion, does the sound quality correspond to what the musicians described before the production?
- Please describe the interaction between the producer and the sound-engineers during the session?
- Please describe the interaction between the producer and the musicians during the session?

If you have any comments on the recording sessions:

On the questions:

Your insight is very useful for us.

Appendix C

World-renowned record producers' interview guide (Chapters 5 & 6)

English version

1. In your opinion, what is your role as a music producer in the context of recording sessions?

2. In your opinion, what make a good music producer? Specifically, what are the most important skills and qualities?

3. How would you describe your approach to achieve the best possible artistic result? Specifically, how do you run a recording session? (Time and project management). Do you use specific methods? If so, please describe them.

4. How would you describe your interaction with musicians? Specifically between takes of the same musical piece/tune. How do you handle musicians' personalities and stress?

5. Usually, do you prepare for a recording session? When and how? Please describe.

6. How long have you been working as a music producer? Please describe briefly your training and career in terms of work environment and musical genres. Please describe the evolution of your own production style.

7. What do musicians expect from you? Please explain.
8. Did the recent changes in the recording industry have an impact on your career? Please explain.
9. Do you have any other comments on music production?
10. Do you have any comments on this specific interview?

French version

1. Selon vous, quel est votre rôle en tant que réalisateur/directeur artistique dans le contexte des séances d'enregistrement?
2. Selon vous, qu'est qui fait un bon réalisateur/directeur artistique? En particulier, quelles sont les compétences que vous nommeriez comme les plus importantes?
3. Comment décririez-vous votre approche pour obtenir le meilleur résultat artistique possible? En particulier, comment dirigez-vous une séance d'enregistrement? (Gestion du temps et du projet) Utilisez-vous des méthodes spéciales? Si oui, décrivez-les s'il vous plaît.
4. Comment décririez-vous votre interaction avec les musiciens? En particulier entre les prises d'un même morceau/chanson. Comment gérez-vous la personnalité des musiciens et le stress?
5. En général, vous préparez-tu pour une séance d'enregistrement? Quand et comment? Décrivez s'il vous plaît.
6. Depuis combien de temps travaillez-vous en tant que réalisateur/directeur artistique? S'il vous plaît décrivez brièvement votre formation et carrière en terme d'environnement de travail et de genre musical.
7. Qu'est-ce que les musiciens attendent de vous? Expliquez s'il vous plaît.
8. Est-ce que les changements récents de l'industrie de l'enregistrement ont eu un impact sur votre carrière? Expliquez s'il vous plait.
9. Avez-vous d'autres commentaires sur la production musicale?
10. Avez-vous d'autres commentaires sur cette entrevue?

Appendix D

World-renowned record producers' musical genre, culture, training and career (Chapters 5 & 6)

ID	Years of experience	Musical genres	Residence	Language for the interview	Training	Career	Also sound engineer	Teaching position
CSE1	36	Classical & contemporary	North America	English	Formal	Worked as staff for a major label (17 years)	Yes	Yes
PIF2	33	Primarily pop-rock	Europe	French	On the job	Independant	Yes	Yes
CIF3	34	Classical & contemporary	Europe	French	Formal	Independant	Yes	Yes
CSF4	35	Classical & contemporary	Europe	French	Formal	Staff for a radio station	Yes	Yes
CSE5	20+	Classical & contemporary	North America	English	On the job	Worked as staff for a major label (10 years)	No	No
PIE6	25+	Underground scene, pop-rock, jazz & classical	North America	English	Self-taught	Independant	Yes	Yes

Appendix E

Questionnaires for the field experiment at the Steinhardt School of New York University (Chapter 7)

Q.1: Recording session questionnaire (for each experiment condition)

1. Which take do you prefer (only 1 answer)?

   - (1)
   - (2)
   - (3)

   Why?

2. How efficient do you think this experimental condition was (only 1 answer)?

   - Very efficient
   - Efficient
   - Neutral
   - Not efficient

- Very inefficient

3. How did you feel recording this tune in this experimental condition?

Any comments:

Q.2: Final recording session questionnaire

1. Which experimental condition did you like the best (only 1 answer)?

   - A: Without listening & Without a producer
   - B: With listening & Without a producer
   - C: Without listening & With a producer
   - D: With listening & With a producer

   Why?

2. Which experimental condition did you feel was the most efficient (only 1 answer)?

   - A: Without listening & Without a producer
   - B: With listening & Without a producer
   - C: Without listening & With a producer
   - D: With listening & With a producer

   Why?

Q.3: Listening session questionnaire (for each experiment condition)

1. Which take do you prefer (only 1 answer)?

   - (1)
   - (2)
   - (3)

   Why?

2. How efficient do you think this experimental condition was (only 1 answer)?
    - Very efficient
    - Efficient
    - Neutral
    - Not efficient
    - Very inefficient
3. Please describe the evolution of these 3 takes:

Any comments:

Q.4: Final listening session questionnaire

Which experimental condition did you feel was the most efficient (only 1 answer)?

- Name of Composition 1
- Name of Composition 2
- Name of Composition 3
- Name of Composition 4
  Why?

Any comments:

Q5: Expert evaluation questionnaire

1. Comments for take 1:
   Comments for take 2:
   Comments for take 3:
2. Please describe the evolution of the takes:

3. Which take do you prefer (only 1 answer)?

   - (1)
   - (2)
   - (3)

   Why?

Appendix F

Coding scheme per categories (Chapter 3)

Notes: we invited the participants to fill out the questionnaire in French if they preferred. In total, two participants answered in French and we chose not to translate the phrasing extracted from their answer. It should also be noted that this coding scheme bring together phrasings extracted from all questions.

Mission

Sub-category	Concept	*Quotation*
Artistic Direction	Guidance	*Over-see; give advice; direction as an orchestra conductor; monitoring musical aspects; choices made aren't affected by the egos the musicians; challenged the musicians to overcome obstacles; sport coach; motivated the musicians; inspire us to go with another take*
	Criticism And Optimization	*Help to improve; constructive critic; be able to ask for corrections; nix-es the bad ideas; help musicians with musical questions; make sure they perform as their best possibility; help to develop a critic mind; help to enhance my ideas (make them more natural, more convincing); useful input; optimizer; help to improve with the arrangement of the tune; encourage to seek out different possibilities; see what other ideas come out*
	Extra Set Of Ears	*Make aware the artist of everything they are doing; recul sur leur performance; outside opinion*
	Esthetic Context	*Help musicians to get a good recording they want to make; find the best way to actualize the musical ideas of the artist; consider the vibe the band creates; having an idea of sound close to the musicians; considerer leur propre direction artistique; listen to the musicians what they want to hear in the recording; same idea of where we wanted to take the project*

Sub-category	Concept	*Quotation*
Sound Choices	Appropriate Sound And Respect For The Artists' Request	*Understand the vibe of the group; fully willing to take suggestions from the musician about their preferred sound and miking techniques for their instrument and work with these suggestions*
	Preconceived Sound	*Brought a preconceived sound into the studio before we had started; no input into what kind of sax sound I would have*
	Suggestions	*Make constructive suggestions if needed; have an opinion if asked; adding a second perspective if asked; make suggestions to improve sound quality; help the musicians by the technical aspects*
Result	Best General Result	*Best possible product; responsible for the quality; Attentive to the final product*
	Best artistic Result	*Make sure the musicians play the best they can; aller au bout des idées et des possibilités; best performance*
	Best Possible Sound	*Get the best possible sound; mix as we wanted*
	Album Concept	*Keep in mind the continuity of the project; project marketability; overseen the complete production*
	Good Sound	*Nice sound; amazing sound*
Technical Responsibilities	Solving Any Technical Issues	*Solving any issues in advance; quickly attend to issues which may arise during the session; s'assurer que tout soit parfait; répondre techniquement aux besoins de la session*
	Technical Issues	*The tech was an issue; sync problem with the MIDI files; no vocal reference, poor monitor system; failed up to backup the files; technical failure in the studio*

Sub-category	Concept	*Quotation*
Organization	Planning And Pre-production	*Coordinator; logistical organizer; budget; pre-production meeting; have a mind for cost; faire des tests avec l'ingénieur; time of day (recording jazz early in the morning simply does not worked); allow musicians to go back to the studio; ordered great food; plan; come early; dependant on the equipment, instruments, spaces and set up that is available*
	Time Management During The Session	*Time management during the session; aware of tiredness; prendre en charge le déroulement de la session*
	Poorly Organized	*the recording schedule was not well thought out; more time was required to achieve a result; didn't have everything working by the time the musicians showed up*
	Keep Track Of Everything Happening	*Notes, takes label, sound changes; write the take sheet*
	Prepare Post-production	*Préparer au mieux la post-prod/good initial mixes/quick edits*
	Pay	*Pay for it all*

Skills

Sub-category	Concept	*Quotation*
Communication	Create A Good Environment and A Good Athmosphere For Performance	*Create a good environment where the music can happen; relaxing; positive impact; nice work atmosphere with engineers and musicians; make the musicians comfortable; make people enjoy the session; make sure everyone get along and happy; kept it fun, positive, creative, flowing; cosy and understandable atmosphere, smooth process fast and cosy; create a good atmosphere for performance; keep the recording process creative and musical; don't put unnecessary stress on musicians; the tech doesn't become an issue; réagir calmement; keeping everybody as happy as possible; healthy environment; positive attitude, taking the session at the musicians' pace, made sure everyone was comfortable in the space, and that they were in the best position possible to play their best*
	Negative Vibe	*Either between bandmates or the recording engineer; the producer was reflecting that stress on the musicians; get noticeable annoyed when he didn't like something being played and he'd get angry and annoyed if the musicians made to many mistakes (got easily frustrated with sound engineers and artists)*
	Trust And Honnesty	*Allow for the honesty of the musicians to come through; musicians feel they can trust him; be confident in conversation; maintain respect for the musicians; établir une relation de confiance; gave honest answers, honest fun*
	Unite All People	*Liaison between artist and engineer; communication skills; create a good connection; psychology; know how to talk to us*
	Help Focusing	*To focus a band; allow the band to focus without interruption; allow the sound-engineer to focus about the sound*

Sub-category	Concept	*Quotation*
	Lack Of Clarity	*The producer didn't have a clear idea of what was required musically or sonically; I was not getting through to the producer/engineer*
Personality	Highly Efficient	*High energy; take decisions quickly; establish clearly what he wants from the musicians; professional*
	Quick And Fast	*Always ready to go; wasn't fast enough to run the tapes; rolled when he needed to; made sure the record button is always going*
	Transparent	*Sit back listen; doesn't get in the way of the musicians; without too much ego; stayed quiet; very passive, not much interaction, taking the session at the musicians' pace; substantive*
	Patient And Compassionate	*Be patient and compassionate towards musicians and their needs; friendly; amicable*
	Flexible And Open-minded	*Open- mindedness; accommodating; have new ideas; try different things; willing to take suggestions from the musician*
	Not Flexible	*Not flexible, it didn't fit what he was hearing and was reluctant to change*
	Stress	*The producer was stressing out; he was in a hurry; let emotions run a bit too wild*
General	Working Knowledge	*Recording and producing; familiarity of the style being recorded; right specialized knowledge; how to get the music together as a whole and through the speakers; all the qualities I look for; appropriate recording experience in the session's genre; recording-mixing methods; expert professional*
	Good Ears And Active Listening	*Phenomenal ears; écoute; ear for good sound; fine-tuned ears; able to listen to the most minute sonic details*
	Good Instincts	*Great feel for textures; good instincts*

Sub-category	Concept	*Quotation*
Technical	Sound	*Recording techniques; sensible mic setup*
	Techniques	*Equipment; board; fixing problems; troubleshooting; setup retakes; headphones mixes; excellent familiarity with the equipment; taking care of all technical aspects; the equipment was working great; the tech did not hinder the creative process; we could correct things right in the spot; unsure of techniques and equipment*
Musical	Music Genre, Theory And Composition	*Music genre; theory; harmony and rythmics; arranging and composing; no music level*
	Experience Of Being A Musician	*Musician; what is to be a musician; execution; interpretation; musical experience*

Interaction

Sub-category	Concept	*Quotation*
Producer With Musicians	Involved And Creative	*Be involved in artistic and creative; decision sound and structure; inspiring; creative ideas; motivate the musicians; can be demanding; adamant about a certain way of doing something even if their personal taste might not necessarily agree; interaction open and professional; add his opinion; objections discussed; solutions figured out; discuss the mix; balanced listeners' and musicians' concerns*
	Not Controlling	*Not getting in the way of the artists; s'associer sans se substituer; not too much involved in some situation; didn't try to control too much, passive, not much interaction; he also gained a lot of creative control, which we didn't initially have involved; demand from you as they are the best producers of the world*
Sound-engineers With Musicians	Explanation	*Took the time to explain what they were doing and why; explained why equipment worked the way it did, and explained his methods when we asked, helped for the musicians to understand what was going to happen*
	General	*Making sure he knew which song we were recording, when we would like to start or stop new takes, which takes we would like to keep and scrap; sentiment d'appartenir au projet*
Producer With Sound-engineers	Sound Creation	*Creation of the music sonically in conjunction with the engineer; responsible with an engineer for the quality of what is captured*
	Too Much Input	*Wanted to be able to add his comments to my communication with the musicians*
Sound-engineers With Producers	Right Hand Of The Producer	*Right hand of the producer; assister le producteur; constante interaction avec le producteur*

Studio preparation

Sub-category	Concept	*Quotation*
Musicians Preparation	Performance Preparation	*The music needs to be at a competent performance level; know the music as well as possible; spontaneous session can also be great; up to the musical situation I am going to find in the studio; from no preparation at all to months and in some cases years; practice the material; learn the music; memorizing the music if possible; rehearse; gig the music for a year (it is best if the band has played several gigs, if not gone on tour before recording happens); write the music*
	Sound Preparation	*My instrument sounds will be adjusted; make sure my instrument is in good condition, new strings, clean, in good tone; have an idea of recorded sounds I like; other CD's soundscapes; I like to know the recording situation (isolation/headphones/overdub); having a practice recording session, in which the group records the material intended to be recorded before the actual recording session; listening back to this recording can reveal improvements to be made before the actual recording session*
	Physical Preparation	*Warming up; sleep well; get sleep; stretch a lot; chill out; relax; eat well; a good breakfast; drink tea; a lot of water*
	General Preparation	*I like to go in the studio before so I can get a feel for the place; plan out the studio itinerary; photocopy music; make sure all charts are in order*

Sub-category	Concept	*Quotation*
Sound-engineers Preparation	Collecting Musical And Sound Information	*Find out how and where the musicians recorded in the past; how the musicians are used to working in the studio, de ses expériences passées en studio; find out what style of recording they are looking for; programme, la durée, l'approche artistique et l'esthetique sonore, l'artiste, son genre musical, sa vision du projet; comparing the idea of sound from the artists and myself; discussion with the musicians; to get information; collecte le plus d'info; how they like to perform; type d'enregistrement: tous dans le meme studio, cabine, "re-re"* [overdub]. . .
	Technical Preparation	*Make reservations for mics, what to use; what equipment I will be using; how to use the gear in the session (enough knowledge of my equipment); have a look at my notes from former sessions with them; I listen to other recordings in the genre including my own, a recording of the piece if it is one that I don't already know; écoute de disques existants dans le genre, références du producteur et musiciens; to be able to change things around as necessary; I go in as early as possible to set up and make sure everything is ready before the artists arrive*
	Planning	*Starting-point plan; planning en fonction; all the contacts and dates; decide which studio; "administrative troubleshooting"; getting the score; making a realistic schedule; collecting names of everyone involved in the session*

Appendix G

Coding scheme for music criteria to describe the best take (Chapter 7: [Q.1.1 & Q.3.1])

Criteria	*Quotation*
Vibe	*dynamic; best performance; intensity and energetic; feel; spirit; musical; momentum; made me want to listen, keep my interest; magic; with conviction; sensitive; mysterious*
Cohesion	*together take; clear; solid overall; w/ direction; flow; forward motion; arch; smooth transitions; not sloppy; cohesion; best road map; consistent energy; big picture; contours; development; everything goes well; efficient; stable*
Natural	*relaxed and comfortable; smooth; organic; real and authentic; fresh vs. forced; natural vs. thought too much; freedom; fun; easy; fluid; discovery; more simple; vulnerable; composed vs. forced*
Time	*tight; strong beat; tempo; groove felt good; concise; better length*
Solos	*individual playing; solos*
Technique	*clean vs. mistakes; in tune; technicality; fix errors; no embarrassing passages; precision*
Attention	*listening; focus; interaction; blending; the band played together; dialogue; attentive*
Creative	*new ideas; different places; creative playing vs. imitating the previous take; variety; inspired; little tweaks; surprising elements; research in sonority*