Attachment Styles and Suicidal Thoughts and Behaviours: A Meta-Analysis

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

*Asterisks indicate cited articles also included in the meta-analysis.

Abstract

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This meta-analysis examined the association between dimensional and categorical conceptualizations of attachment styles and suicidal thoughts and behaviours (STBs). Random-effects meta-analysis was conducted to examine the associations between categorical secure attachment, categorical insecure attachment, and insecure attachment dimensions and STBs. Methodological moderators were also explored. This protocol was registered in PROSPERO (CRD42020152604). Systematic search for articles published by December 2020 returned 58 eligible studies and 159 cross-sectional effects. Secure attachment was inversely associated with suicidal thoughts and not associated with suicide attempts. All categorical insecure attachment styles were positively associated with suicidal thoughts. Only fearful and preoccupied attachment were associated with risk for suicide attempts. Dimensional attachment anxiety was more strongly associated with suicidal thoughts and attempts than dimensional attachment avoidance. Overall, attachment styles characterized by high attachment anxiety were associated with greatest vulnerability to STBs. Longitudinal studies are needed to better understand the association between attachment insecurity and STBs.

Keywords: attachment; suicidal thoughts; suicide attempts; meta-analysis

*Asterisks indicate cited articles also included in the meta-analysis.

Introduction

Suicidal thoughts and behaviours (STBs) encompass a range of suicidal experiences, from passive thoughts about one's own death to suicide attempts with lethal intent (Silverman et al., 2007). Suicide is the second leading cause of death in adolescence and young adulthood and among the top three leading causes of death for adults worldwide (World Health Organization, 2020). Lifetime prevalence estimates range from 9 to 22% for suicidal thoughts and approximately 3% for suicide attempts, and these STBs are strongly associated with future suicide deaths (Mortier et al., 2018; Nock et al., 2008; Orri et al., 2020). A better understanding of risk factors for suicidal thoughts and behaviours are imperative to develop and tailor prevention and intervention methods for this important public health issue.

Contemporary theories of suicide and empirical research have highlighted that distinct indicators of poor social relationship functioning are risk factors for STBs. Perceived lack of social connectedness and perceived burdensomeness toward others are important contributors to the onset of suicidal thoughts (Chu et al., 2017; Joiner, 2005; Van Orden et al., 2010). Conversely, a sense of belongingness and the perceived availability of social support could serve as protective factors against STBs following social stress and during periods of hopelessness and emotional pain (Klonsky & May, 2015; O'Connor & Kirtley, 2018). Therefore, individuals with difficulties forming and maintaining close, high quality relationships with others may be at greater risk for STBs.

Attachment theory is a key conceptual framework explaining the formation and maintenance of close relationships across the life course (Bowlby, 1983). Attachment theory postulates that early experiences with caregivers influence one's internal representations about the availability and responsiveness of close others in providing support and care in times of need,

and about the worthiness of the self in relation to others (Ainsworth et al., 1978; Mikulincer & Shaver, 2007). These internal working models of the self and of others are acquired during infancy based on interpersonal experiences with caregivers in times of need (Ainsworth et al., 1978). Although subsequent relationship experiences can modify these attachment representations, they tend to be fairly stable throughout the lifespan (Fraley, 2002; Fraley et al., 2011; Pinquart et al., 2012). In turn, these internal working models of attachment are thought to influence how individuals construe and negotiate close relationships throughout their lives (Fraley & Shaver, 2000).

Adult attachment style can be assessed using two related, yet distinct conceptualization and measurement traditions. The first tradition originates from developmental psychology and uses a categorical approach whereby individuals are classified into one of four attachment categories (Bartholomew, 1990). Adults with s*ecure* attachment are able to depend on close others in times of need and do not generally worry about being abandoned. Among those with insecure attachment, adults with *dismissing* attachment feel uncomfortable in close emotional relationships and have difficulty depending on others in times of need. In contrast, those with *preoccupied* attachment seek proximity and close emotional relationships but feel as though others do not seek the same proximity and emotional closeness to them and they are concerned about being rejected by others. Finally, adults with *fearful* attachment (also known as disorganized or unresolved attachment; Mikulincer and Shaver, 2007) desire close emotional relationships in times of need, but feel uncomfortable in such situations, have difficulty trusting, and worry about being hurt by close others (Bartholomew & Horowitz, 1991).

The second conceptualization and measurement tradition comes from social and personality psychology and uses a dimensional rather than a categorical approach. Taxometric

studies suggest that the four-categorical conceptualization of adult attachment style is organized along two orthogonal dimensions of *attachment anxiety* and *attachment avoidance* (Brennan et al., 1998). Specifically, adults who are higher on the attachment anxiety dimension, analogous to the preoccupied attachment style, tend to worry about the availability of their partners in times of need and fear rejection from close others. In contrast, adults higher on the dimension of attachment avoidance, similarly to the dismissing attachment style, do not feel comfortable opening up to or relying on others. In this dimensional measurement approach, each individual receives two continuous scores to characterize their attachment style, one based on attachment anxiety and the other on attachment avoidance. Individuals may be high or low on one or both of these dimensions, with adults high on both dimensions resembling the fearful attachment style, and those lower on both these dimensions displaying a more secure attachment style.

Secure attachment, found in approximately 56 to 59% of adults, has been consistently associated with better relationship functioning and mental health outcomes compared to the insecure attachment styles (Hazan & Shaver, 1987; Mickelson et al., 1997). For example, results from meta-analyses using categorical conceptualizations of attachment have demonstrated that secure attachment is associated with better friendship quality and social competence (Benson et al., 2006; Groh et al., 2014; Schneider et al., 2001) and lower prevalence of psychiatric symptoms and disorders (e.g. post-traumatic stress disorder, positive and negative psychosis symptoms), compared to insecure attachment styles (Carr et al., 2018; Woodhouse et al., 2015). Similarly, meta-analyses of dimensional attachment styles have shown that although both insecure dimensions are negatively associated with general relationship satisfaction, anxious attachment is associated with more relationship conflict (Li & Chan, 2012), whereas avoidant attachment is associated with poorer perceptions of support and connectedness (Candel &

Turliuc, 2019). Insecure attachment dimensions, particularly anxious attachment, have also been associated with greater prevalence of internalizing symptoms and borderline personality traits (Dagan et al., 2019, 2020; Smith & South, 2020). Thus, attachment styles are differentially related to relationship functioning and internalizing symptoms, both of which are important predictors of STBs. Research examining whether attachment styles may also be differentially and directly related to STBs is important, as it could provide insight into potential interpersonal and emotion regulation mechanisms as described by attachment theory that may contribute to STBs over time.

Two reviews of the literature linking attachment styles and STBs have been conducted. In a first narrative review of the association between attachment styles and STBs, Miniati and colleagues (2017) concluded that insecure attachment, most often anxious attachment, was associated with greater risk for STBs. Similarly, Zortea and colleagues (2021) conducted a systematic review of the literature on the association between attachment styles and STBs. They highlighted the complex associations among the four categorical and two dimensional attachment styles and different suicidal outcomes. They concluded that although secure attachment was inversely associated with STBs, insecure attachment (across both measurement models and all attachment styles) was a risk factor for STBs. However, these narrative reviews could not quantify and compare the magnitude of the association between different insecure attachment styles and specific STBs. Also, whereas Zortea and colleagues (2021) reviewed psychological moderators and mediators of the association between attachment style and STBs (e.g. gender, loneliness, self-criticism, depressive symptoms), the methodological factors that may moderate the association between specific attachment styles and STBs are still unknown. Together, these caveats highlight the need for a meta-analytic investigation of the magnitude of

the associations among specific attachment styles and STBs, as well as an examination of the methodological moderators of these associations.

The goal of this study was to summarize the collective evidence on the association between attachment styles and STBs. We aimed to systematically identify and summarize extant literature on this topic, and to quantify the association between attachment styles and STBs using meta-analysis across both conceptualizations of attachment theory. Dimensional and categorical conceptualizations of attachment style both rely upon the same underlying attachment theory, but reflect different operationalization and measurement of attachment styles. These methodological differences may be systematically associated with clinical outcomes (Fraley et al., 2015) and may represent an important source of heterogeneity in the association between attachment styles and STBs (Ravitz et al., 2010). Furthermore, the ideation-to-action framework suggests that distinct predictors are associated with suicidal thoughts, compared to suicide attempts (Klonsky & May, 2015). Thus, the strength of the association between attachment styles and STBs were examined separately for suicidal thoughts and attempts. We also aimed at examining clinical and methodological moderators (sample type, developmental stage, continuous or categorical measurement of variables, publication type, study quality) of this association.

It was expected that within the categorical conceptualization of attachment style, secure attachment would be negatively associated with STBs, whereas insecure attachment styles, particularly those characterized by more attachment anxiety (Miniati et al., 2017), would be positively associated with STBs. Similarly, within the dimensional conceptualization of attachment style, it was expected that insecure attachment, particularly greater attachment anxiety (Miniati et al., 2017), would be positively associated with STBs. Based on evidence showing stronger associations between dimensional measures of attachment style and clinical

outcomes (Chiesa et al., 2017; Fraley et al., 2015; Shi et al., 2014), it was expected that dimensional insecure attachment styles would be more strongly associated with STBs than categorical insecure attachment styles.

Method

Literature Search

This protocol was pre-registered with PROSPERO (CRD42020152604). A literature search was conducted across PubMed, PsycInfo, Web of Science, and Scopus for article selection from conception of the databases to December 1st, 2020. Boolean searches in electronic databases included the use of three keywords: "attachment" and ("suicid*" or "self-harm"). Keywords were searched anywhere in text (i.e., title, abstract, meta data, full text, when available). An ascendancy approach was also taken by reviewing the reference sections of included articles to identify possible additional articles for inclusion. Three people performed the search independently using Rayyan online software (Ouzzani et al., 2016), and discrepancies were reconciled by discussion until meeting three-way consensus. See Figure 1 for Article Search and Flow.

Inclusion/Exclusion Criteria

Following the removal of duplicates, records were screened according to the following criteria:

1. Only English and French language articles were considered.
2. Only quantitative studies were considered. Thus, non-empirical reviews, case reports, and qualitative studies were excluded.

3. Studies required a quantitative measure or classification of STBs (suicidal thoughts, attempts, or deaths). Studies measuring non-suicidal self-injury (i.e., without suicidal intent) or combining self-injury with and without suicidal intent were excluded.
4. Studies required a quantitative measure of attachment style based on the categorical or dimensional operationalization of attachment theory. As such, only studies including categorical conceptualizations of secure, dismissive, preoccupied, and fearful attachment or dimensional conceptualizations of attachment anxiety or avoidance were included.
5. Studies had to report a quantitative association between STBs and attachment styles. Studies reporting comparisons between groups using mean differences or number of cases per cells required a control group with no suicidality (e.g. STBs vs. no STBs groups). Studies reporting on a continuous measure of the association between attachment style and STBs required a correlation estimate for an effect size to be computed. Authors were contacted when insufficient information to compute effect sizes were provided in text.
6. Studies available in journals and unpublished dissertations were considered for inclusion. However, if dissertations were also available in peer-reviewed journal article format, the article format was retained.

Based on these criteria, 58 cross-sectional and/or longitudinal studies published in academic journals (k = 46, where k = number of studies) or available as dissertations (k = 12) between

1995 and 2020 were included in the current meta-analysis. See Appendix A for the full reference list of included articles.

Data Extraction and Coding

Data extraction. All 58 included articles were examined to retrieve information related to the study characteristics and effect sizes of the associations between attachment style and STBs. Each study that met inclusion criteria was coded on all the following dimensions: name of the first author, year of publication, type of publication (journal article or dissertation), geographic region where the study was conducted, sample size, developmental period (adolescents, adults, or mixed), percentage of females, research design (cross-sectional or longitudinal) and length of first and last follow-ups when appropriate. The sample type was coded as *Clinical* when participants were recruited from clinical populations (psychiatric and/or medical) or *Community* when participants were recruited from academic or community settings. To capture differences in base rates of STBs across samples which may affect the observed associations, the clinical severity of samples was also coded as *Suicidal* when the presence of suicidal thoughts and/or attempts were an inclusion criterion for part of or the entire sample, or *Non-Suicidal* when STBs were not a specific inclusion criterion.

Attachment style was coded based on the categorical conceptualization (secure, preoccupied, dismissing, fearful), or the dimensional conceptualization (attachment anxiety and avoidance) of attachment theory. Most measures based on the categorical model of attachment produce a single classification score, while those based on the dimensional conceptualization produce two scores per person. However, some measures based on the categorical conceptualization also provide continuous scores for each category (e.g., Kerns et al., 1996; *Nagra et al., 2016). Therefore, categorical attachment styles were further coded based on

whether the construct was measured continuously (i.e. one score per attachment dimension/style per person) or categorically (i.e. one categorical attachment score per person).

Codes were also provided based on the type of STBs observed: suicidal thoughts (without attempts) or suicide attempts. For some studies, the suicidal outcome was measured using tools that combined both suicidal thoughts and attempts (e.g. Suicidal Behaviours Questionnaire-Revised; Osman et al., 2001). These were coded as suicide attempts[1]. No eligible studies reported on suicide deaths. In addition, the measurement of the STBs was coded as measured categorically (STBs vs no STBs groups) or continuously (severity of STBs on a continuous scale).

Study quality was assessed using 5 criteria described by Mirza and Jenkins (2004) and Woodhouse and colleagues (2015): (i) explicitly stating study aims, (ii) clear inclusion and exclusion criteria for participants, (iii) using a validated measure of STBs, (iv) using a validated measure of attachment style, and (v) using statistical analyses appropriate to study aims and objectives. Each criterion was scored 1 (yes) or 0 (no), for a maximum score of 5 where higher scores indicated better study quality.

Codes were developed by the lead author with consensus from co-authors. All coding and extraction of effect sizes was independently completed by two individuals (S.M. & L.R.). Discrepancies across any of these codes or the extraction of the effect size were found in 13.48% of effects (24 effects across 8 studies), and were resolved via consensus between the coders.

Effect sizes. Hedges' *g* effect sizes were computed for all studies. Depending on the measurement methods for both STBs and attachment style, individual studies could produce up

[1] The overall patterns of results were similar when these were coded as suicidal thoughts.

to 8 effect sizes (e.g., associations between each of the four categorical attachment styles with both suicidal outcomes - thoughts and attempts - per study). Three different types of data were obtained from eligible studies and were manipulated to compute effect sizes according to the following specifications:

- **Group differences**. For studies reporting continuous attachment style and categorical STBs groups (or vice versa), means and standard deviations were used to compute Hedges' *g* effect sizes. Hedges' *g* effect sizes were computed directly from the raw data (means, standard deviations, sample sizes) using the equations provided by Borenstein, and colleagues (2009). In all, 56 effects (31.46%) used this type of data.
- **Odds ratios.** For studies where both attachment style and STBs were measured categorically, odds ratios (OR) were computed using the statistical formulae described by Kline (2013). Specifically, data were organized into 2x2 tables with secure attachment style vs insecure attachment styles (combined), or with the individual insecure attachment style vs. secure attachment style as the rows. Thus, each categorical insecure attachment style (dismissing, preoccupied, fearful) was compared to secure attachment style. Columns included the control "no STBs" group vs. the relevant suicidal group (thoughts or attempts). Individual cells contained the number of cases (participants) classified to each condition. ORs were calculated from this raw data and converted into a logistic mean difference effect size, *logit d*, providing a measure of the desired categorical contrast on a continuous scale (Kline, 2013), and further transformed into a Hedges' *g*. A total of 42 effect sizes (23.60%) were computed using these procedures.
- **Correlations.** Associations originally described using correlation coefficients were available when both attachment style and STBs were assessed using a continuous scale.

Correlation coefficients were converted into standardized mean difference effect sizes, and further transformed into Hedges' *g* effect sizes (80 effects, 44.94%) using the methods described by Borenstein et al. (2009) and Polanin and Snilstveit (2016).

Meta-Analytic Statistical Method and Analyses

The primary goal of this study was to obtain an average estimate of the association between attachment styles and suicidal thoughts and attempts. Suicidal thoughts and attempts were examined as separate outcomes because they tend to have distinct predictors (Klonsky et al., 2016), and to reduce the non-independence of effect sizes per analysis. We first examined the association between categorical secure (vs. insecure) attachment and STBs. Next, we examined the associations between individual categorical insecure attachment styles (preoccupied, dismissing, fearful vs. secure) and STBs. Finally, we examined the associations between dimensional attachment anxiety and avoidance and STBs.

For all three meta-analyses, relevant effects were aggregated and weighted based on their variance using the random effects method of Hedges and Vevea (1998). Analyses pertaining to insecure attachment styles could include up to three effects per study (1 effect per each of the 3 categorical attachment styles or 1 effect for each of the 2 continuous attachment dimensions)[2]. Significance testing with alpha set at .05 and 95% confidence intervals (CI) were used to determine whether the overall effect estimate differed from zero. To determine potential publication bias and the file-drawer problem, Duval and Tweedie's (2000) Trim and Fill method was used. This nonparametric method imputes missing studies to the left or the right of an

[2] To address the issue of non-independence of effects within these analyses, additional sensitivity analyses were conducted by running different models per each attachment style or dimension (i.e. 6 models) rather than grouping them according to attachment theory models. The pattern of results was identical.

asymmetrical funnel plot and consequently adjusts the mean estimate to represent the true mean of all published and unpublished studies.

Moderator analyses were planned to identify sources of heterogeneity across studies. The heterogeneity across studies was estimated using the I-squared (I^2) statistic, which reflects the proportion of variance in observed effects attributable to between-study heterogeneity rather than sampling error, with larger I^2 estimates indicating greater inconsistency across studies (Higgins et al., 2020). Sources of heterogeneity were explored using subgroup random effects analyses and meta-regressions. In the subgroup analyses, effect sizes were compared across levels of categorical moderators. Significance testing and 95% CI were used to determine whether estimates for each subgroup differed from zero. Additionally, Q tests (similar to analyses of variance; Borenstein et al., 2009) were used to determine whether overall estimates across levels of the moderator subgroups differed significantly from one another. The categorical moderators included: attachment styles, sample type (clinical vs. community), sample severity (suicidal vs. non-suicidal), developmental stage (adolescents, adults, or mixed), STB measurement method (categorical vs. continuous), and publication type (dissertation or journal article). Analyses were also conducted to determine whether attachment scoring method (categorical vs. continuous) moderated the association between categorical secure and insecure attachment categories and STBs. Dimensional attachment styles were measured continuously in all studies. The influence of two additional continuous moderators, percentage of females in the study sample and study quality, was also examined using meta-regression analyses, in which each continuous moderator served as an independent variable predicting effect sizes. This method produces regression coefficients to observe the linear association between the continuous moderator and effect sizes.

Exploratory analyses were also conducted to examine the longitudinal associations between attachment styles and STBs. As an insufficient number of longitudinal effects were available to probe individual main and moderating effects, effect sizes were averaged according to the categorical and dimensional models of attachment and across STBs to observe preliminary longitudinal associations. All analyses were conducted using the Comprehensive Meta-Analysis software, version 3 (Borenstein et al., 2013).

Results

The sample and methodological characteristics of all eligible studies are described in Appendix B. From the 58 studies, 60.34% (k =35, 33 cross-sectional, 2 longitudinal) used measures anchored within the categorical conceptualization of attachment style, of which 14 (40.00%) used categorical scoring methods and 21 (60.00%) used continuous scoring methods. The other 23 studies (39.66%, 21 cross-sectional, 2 longitudinal) were based on the dimensional conceptualization, of which 22 (95.45%) used continuous measurement tools and 1 (4.55%) used categorical scoring methods. A total of 178 effect sizes were included in the quantitative analyses, of which 159 (89.33%) were cross-sectional and 19 (10.67%) were longitudinal.

Collectively, 17 195 participants were included across all studies, and approximately 61% of these participants across studies were female. A majority of studies recruited from clinical settings (k = 37, 63.79%). In terms of sample severity, 13 studies (22.41%) had suicidality as an inclusion criterion. In terms of age group, 38 studies (65.52%) recruited adult samples, 16 recruited adolescent samples (27.59%), and 4 (6.90%) included both adolescents and adults. A large majority of these studies were conducted among North American samples (k = 37, 63.79%), with the others being conducted in Europe (k = 11, 18.97%), the Middle East (k = 8, 13.79%), and Asia (k = 3, 5.17%). Only 36 studies (62.07%) provided information on

participant ethnicity, with 61.5% of the participants in these studies identifying as White. Although there were many indices of socio-economic status used across studies (e.g. educational attainment, parental educational attainment, employment status, marital status, household income, welfare recipient), these indices were not consistent across studies, precluding the use of this information as a moderating variable.

Methodologically, most studies included in this meta-analysis were cross-sectional in design. Only five studies used longitudinal designs, with follow-up intervals lasting from 1 to 24 months. Importantly, a variety of tools were used to measure both attachment styles and STBs. The most common tools of attachment style across studies were the Experiences in Close Relationships Questionnaire (k = 16; Brennan and Clark, 1998) and the Relationships Questionnaire (k = 15; Bartholomew & Horowitz, 1991). Of all 58 studies, 55 (94.83%) used validated measures of attachment styles. In turn, STBs were measured with both categorical and continuous measures, with 49 studies (84.48%) using a large variety of validated measures assessing suicidality explicitly (e.g., Suicidal Behaviours Questionnaire-Revised; Osman et al., 2001) or single-items taken from proxy clinical measures (e.g. item 9 on suicidality of the Beck Depression Inventory; Beck et al., 1996). Nine studies (15.52%) used non-validated questions about suicidality devised for their study (e.g., In the recent year, how much suicide ideation did you experience?; *Valikhani et al., 2018).

Categorical Conceptualization of Attachment Style and STBs

Secure attachment. The overall association between secure attachment and suicidal thoughts and attempts was first explored. Results from all main effect and moderation analyses are reported in Table 1. The average estimate based on 21 effects from 21 studies indicated a significant overall moderate inverse association between secure attachment and suicidal thoughts

compared to insecure attachment styles. Trim & fill analyses demonstrated symmetry of the funnel plot for these effects (0 studies trimmed), indicating minimal effect of publication bias on these results requiring no adjustment to the overall estimate. Substantial heterogeneity was observed across studies (I^2 = 81.933%). Subgroup moderating analyses indicated that measurement of STBs was a significant source of heterogeneity between studies. Specifically, studies using continuous measurement of suicidal thoughts reported significantly larger effect sizes than those using categorical measurement tools. Also, significantly larger effect sizes were observed among community samples compared to clinical samples. No differences in the association between secure attachment and suicidal thoughts were observed across sample severity, developmental stage, categorical/continuous scoring of attachment, nor publication type. Further, no significant moderating effects of percentage of females (b = 0.003, SE = 0.004, p = .44), nor study quality (b = -0.11, SE = 0.084, p = .18) were observed.

For suicide attempts, the average estimate based on 12 effects from 12 studies indicated a significant small inverse association between secure attachment and suicide attempts. Trim & fill analyses indicated evidence of publication bias (4 studies trimmed), adjusting the estimate to g = -0.203, 95% CI [-0.420, 0.013], indicating a non-significant association between secure attachment style and suicide attempts. Further, small to moderate heterogeneity was observed across studies (I^2 = 39.989%). Moderating analyses indicated that secure attachment was significantly associated with decreased risk for suicide attempts only among clinical and among adult samples. No moderating effects of sample severity, STB or attachment style scoring methods, nor publication type were observed. Further, no significant moderating effects of percentage of females (b < 0.001, SE = 0.009, p = .98), nor study quality (b = -0.101, SE = 0.116,

p = .38) were observed. Figure 2 depicts the associations between secure attachment and suicidal thoughts (Figure 2a) and attempts (Figure 2b).

Insecure attachment. Next, the associations between categorical insecure attachment styles and suicidal thoughts and attempts were explored. Across 47 effect sizes extracted from 20 studies, categorical insecure attachment styles were associated with statistically significant but small positive risk for suicidal thoughts overall, compared to secure attachment. Funnel plot Trim & Fill analyses indicated no asymmetry in the funnel plot (0 studies trimmed), suggesting minimal effect of publication bias. Large heterogeneity between studies was observed, representing 83.539% of the variance. Results from main and moderating analyses are presented in Table 2. Subgroup moderator analyses revealed significant differences across insecure attachment styles. All insecure attachment styles were associated with increased risk for suicidal thoughts (Figure 3a). Further, although there was no moderating effect of developmental stage, only studies including adult participants demonstrated a significant association between insecure attachment styles and suicidal thoughts. Measures using continuous scoring methods of STBs also reported significantly stronger associations than those using categorical scoring methods. Although sample severity was not a significant moderator, only studies from non-suicidal samples demonstrated a significant association between insecure attachment and suicidal thoughts. Sample type, categorical/continuous scoring of attachment styles, and publication type were not significant moderators of the association between insecure attachment styles and suicidal thoughts, although only effects drawn from journal articles reported significant associations with suicidal thoughts. No moderating effects of percentage of females (*b* = -0.001, *SE* = 0.003, p = .74), nor study quality (*b* = 0.051, *SE* = 0.070, *p* = .46) were observed.

Next, based on 32 aggregated effects from 14 studies, categorical insecure attachment styles were associated with significant small positive risk for suicide attempts. Funnel plot Trim & Fill analyses indicated the presence of asymmetry in the funnel plot (7 studies trimmed), suggesting the presence of publication bias. The adjusted estimate (g = 0.169, 95% CI [0.068, 0.270] still indicated a significant small positive risk for suicide attempts. Small heterogeneity between studies was observed (I^2 = 10.531%). A significant moderating effect of attachment style was observed, such that fearful and preoccupied attachment were more strongly associated with suicide attempts than dismissing attachment. Dismissing attachment was not associated with risk for suicide attempts (Figure 3b). Only adult samples demonstrated significant associations between insecure attachment and suicide attempts. No moderating effects of sample type, sample severity, STBs or attachment scoring methods, nor publication type were observed. Further, no moderating effects of percentage of females (b = 0.002, SE = 0.005, p = .76), nor study quality (b = 0.106, SE = 0.068, p = .12) were observed.

Dimensional Conceptualization of Attachment and STBs

The associations between insecure attachment dimensions and STBs are described in Table 3. Based off 19 effects drawn from 10 studies, insecure attachment dimensions were associated with overall moderate positive risk for suicidal thoughts. Substantial heterogeneity between studies was observed (I^2 = 83.096%). Trim and Fill analysis indicated symmetry of the funnel plot (0 studies trimmed) with no imputations and adjustment to the overall effect required. Subgroup analyses indicated that attachment dimension (anxious vs. avoidant) was a significant source of heterogeneity. As depicted in Figure 4a, moderation analyses demonstrated that attachment anxiety was more strongly associated with suicidal thoughts than attachment avoidance. Attachment avoidance was not significantly associated with suicidal thoughts. In

addition, sample type was a significant moderator, such that effect sizes drawn from community samples were significantly larger than effects from clinical samples. Similarly, sample severity was a significant moderator, with stronger associations between insecure attachment dimensions and suicide attempts observed in non-suicidal samples compared to suicidal samples. Finally, developmental stage was a significant moderator, such that effects drawn from adult samples were significantly larger than those drawn from adolescent samples. Adolescent samples reported no significant association between insecure attachment dimensions and suicidal thoughts. No moderation effects were found based on STBs or attachment scoring methods, publication type, percentage of females (b = -0.008, SE = 0.006, p = .19), nor study quality (b = -0.017, SE = 0.142, p = .91).

Across 28 effects drawn from 14 studies, the overall estimate for the association between insecure attachment dimensions and suicide attempts indicated moderate positive risk. However, Trim & fill analyses demonstrated asymmetry in the funnel plot, with evidence of publication bias and 3 studies trimmed to the left of the mean. The adjusted overall estimate for the association between insecure attachment dimensions and suicide attempts is g = 0.352, 95%CI [0.187, 0.517]. Substantial between-study heterogeneity was also observed (I^2 = 86.409%). Subgroup analyses indicated a significant moderating effect of attachment dimension, such that both attachment anxiety and attachment avoidance were significantly associated with risk for suicide attempts, and this association was significantly stronger for attachment anxiety. In addition, a moderating effect of sample type was observed, such that significantly larger associations were reported among community samples compared to clinical samples. No other categorical moderating effects were observed. No moderation effects for percentage of females

(b = 0.006, SE = 0.005, p = .25), nor study quality (b = -0.095, SE = 0.148, p = .52) were observed.

Exploratory analyses

Longitudinal effects of attachment styles on STBs were considered. Only five eligible studies (3 using the categorical model and 2 using the dimensional model of attachment styles) provided information on longitudinal associations between attachment styles and STBs, producing 19 effect sizes overall. Preliminary visual inspection of the limited available data demonstrated weaker but similar trends to cross-sectional effects, as shown in Appendix C.

Discussion

The primary goal of the present meta-analysis was to expand upon the qualitative reviews of Miniati et al. (2017) and Zortea et al. (2019) and quantify the associations between attachment styles and STBs across two distinct yet related attachment theory conceptualization and measurement traditions. In line with these two qualitative reviews, results showed that secure attachment based on the categorical conceptualization of attachment style was associated with a moderate inverse association with suicidal thoughts (g = -0.456), but not with suicide attempts based on adjusted estimates (g = -0.203). It was also shown that insecure attachment styles were associated with a small positive risk for suicidal thoughts overall, with statistically significant associations observed between fearful attachment (g = 0.390), preoccupied attachment (g = 0.406) and dismissing attachment (g = 0.224) with suicidal thoughts. Only fearful (g = 0.330) and preoccupied attachment (g = 0.300) were associated with risk for suicide attempts. In turn, among studies using a dimensional measurement model, only attachment anxiety (g = 0.573) was associated with suicidal thoughts. Both insecure attachment dimensions were associated with suicide attempts, although this association was stronger for attachment anxiety (g = 0.581)

compared to attachment avoidance (g = 0.261). In general, significant associations were observed in samples including adults but not in those including only adolescents. Associations also tended to be stronger among community samples. As such, these results extend and nuance the reviews of Miniati et al (2017) and Zortea et al., (2021) by showing that the attachment anxiety dimension in both the categorical and dimensional measurement traditions of attachment style is more strongly associated with STBs than attachment avoidance.

The results from this meta-analysis highlight that, despite methodological variations in the measurement of attachment styles, the strongest risk for STBs was found with attachment styles characterized by high attachment anxiety. Within the dimensional attachment framework, attachment anxiety was more strongly associated with STBs than attachment avoidance. Within the categorical framework, fearful attachment and preoccupied attachment, both characterized by high attachment anxiety, demonstrated moderate significant associations with STBs, respectively. Dismissing attachment characterized by higher attachment avoidance and lower attachment anxiety was not associated with STBs. Thus, similar trends are observed across both categorical and dimensional conceptualizations of attachment style. These associations were also stronger among studies using continuous rather than categorical scoring of attachment within the categorical conceptualization of attachment style. These measurement-related differences are in line with taxometric studies of attachment styles that demonstrate stronger associations between dimensionally-measured attachment styles and clinical outcomes (Chiesa et al., 2017; Fraley et al., 2015; Shi et al., 2014). As such, attachment anxiety might be a particular risk factor for STBs regardless of measurement model, although dimensional models and measurement may best capture this risk factor.

The Three-Step Theory of suicide states that emotional pain and hopelessness are necessary precursors for the development of suicidal thoughts, and these thoughts become more severe when emotional pain exceeds perceptions of social connectedness (Klonsky & May, 2015). Individuals with higher attachment anxiety crave close and intimate relationships and experience the negative consequences of the absence or loss of such relationships more strongly than individuals with less attachment anxiety (DeWall et al., 2012; Feeney, 2002). Empirical research suggests that individuals with higher attachment anxiety perceive their social networks as less dense (Gillath et al., 2017) and tend to experience more relationship dissolution (Gillath et al., 2011). In cross-sectional studies, the negative association between attachment security and suicidal thoughts was mediated by perceptions of poor social belongingness and social support (*Venta et al., 2014). Similarly, anxious attachment was cross-sectionally associated with increased interpersonal sensitivity and perceived loneliness, which in turn were associated with greater likelihood and lethality of suicide attempts (*Levi-Belz et al., 2013; *Stepp et al., 2008). Therefore, individuals with higher attachment anxiety, who are hypervigilant for signs of interpersonal rejection, may experience social disconnection as more distressing and be more likely to experience greater emotional pain, hopelessness, and suicidality in response to ruptures in social connections.

Individuals with higher attachment anxiety may also be at greater risk of perceiving or creating ruptures in social connections. In moments of high emotional pain and hopelessness, individuals with higher attachment anxiety may engage in hyper-activating strategies characterized by persistent and energetic proximity-seeking efforts, which may paradoxically sustain or exaggerate negative emotions in order to elicit caring and protective responses from others (Mikulincer and Shaver, 2007). Such strategies may become a form of strain or conflict

within closer relationships over the long-term (Gillath et al., 2019; Main, 1990; Mikulincer and Shaver, 2007). This growing instability in close relationships may enhance feelings of thwarted belongingness and perceived burdensomeness, two mediating factors identified by the interpersonal theory of suicide as increasing risk for STBs (*Allbaugh et al., 2018; *Levi-Belz et al., 2013; Molaie et al., 2019; Øverup et al., 2017; Strang and Orlofsky, 1990; Van Orden et al., 2010; *Venta et al., 2014; *Zeyrek et al., 2009). In contrast, individuals with higher attachment avoidance tend to use deactivating behavioural strategies meant to maximize self-reliance, avoid intimacy, and create emotional distance between the self and others in times of need. Individuals with higher attachment avoidance may then experience less relationship strain or distress following relationship dissolution (Simpson, 1990), somewhat mitigating their risk for STBs. Future research should examine emotional pain, thwarted belongingness and perceived burdensomeness as potential mediators of the association between attachment anxiety and STBs.

Alternatively, it has been posited that the expression of STBs can be, in certain contexts, a form of hyper-activation of the attachment system in order to rebuild social connectedness following interpersonal ruptures (Mikulincer & Shaver, 2007). In some cases, STBs might be considered a behavioural strategy to gain attention, love, and compassion when close others are perceived as unresponsive or unavailable. Empirical research shows that individuals endorsing these motivations for suicidality demonstrate protective factors against suicide death, including less intent to die and less lethal suicide attempts, possibly due to their continued investment in maintaining their social relationships and connections to others (Klonsky et al., 2016). However, only a minority of individuals endorse such motivations and empirical research evaluating how these motivations for STBs relate to attachment styles is lacking.

Moderating analyses demonstrated differences in the association between attachment styles and STBs based on certain clinical factors. Specifically, associations between attachment styles and STBs were generally stronger among adults than adolescents. Although studies have demonstrated that attachment styles are quite stable throughout the lifespan (Pinquart et al., 2012), others have shown that this stability improves from adolescence into adulthood (Jones et al., 2018). This stability in adulthood may allow for clearer associations to be observed between attachment styles and STBs during this developmental stage. Insecure attachment styles and dimensions were more strongly associated with suicidal thoughts and attempts in community compared to clinical samples. It is possible that individuals with STBs may be more distinct from their counterparts in community samples compared to those in clinical samples. Specifically, community samples may have a majority of participants with secure attachment (Hazan & Shaver, 1987; Mickelson et al., 1997) whereas clinical samples may have a larger proportion of participants with insecure attachment styles (Mikulincer & Shaver, 2012). Further, insecure attachment styles are likely to develop in the context of childhood neglect and/or maltreatment (Erickson et al., 2019), and are associated with depression (Dagan et al., 2019), anxiety (Dagan et al., 2020), borderline personality disorder traits (Fossati et al., 2005; Smith & South, 2020), substance use disorders (Schindler, 2019), and non-suicidal self-injury (Wrath & Adams, 2018), among others, all of which are more prevalent in clinical samples and are independently related to both suicidal thoughts and attempts (Black et al., 2004; Cougle et al., 2009; Hamza et al., 2012; Ribeiro et al., 2018; Yuodelis-Flores & Ries, 2019). The larger associations between insecure attachment styles and STBs in community samples may be related to the lower prevalence of insecure attachment styles in the general population, compared to in clinical samples. Insecure attachment styles may therefore better distinguish individuals with STBs from

their non-clinical counterparts compared to their counterparts with psychiatric needs. Nonetheless, these results demonstrate the potential utility of insecure attachment styles, particularly attachment anxiety, in identifying risk for STBs within low-risk community samples. More studies comparing high-risk and low-risk samples using longitudinal designs and examining the changes across developmental stages on the association between attachment styles and STBs are needed.

Another goal of this meta-analysis was to address potential methodological factors associated with measurement of both attachment styles and STBs. A variety of tools were used to measure attachment styles across two related yet distinct measurement models of attachment theory, highlighting great methodological heterogeneity in the research on attachment styles and STBs. An important area for future work is the harmonization of this research domain. In this meta-analysis, studies using measures with continuous scoring of attachment styles and/or STBs reported stronger associations than those using categorical scoring of both attachment style and STBs. In a similar vein, while overall trends were similar across both conceptualizations of attachment style, those effects characterizing the dimensional model of attachment were consistently larger than those based on the categorical model. In this case, it is possible that the categorical measurement of attachment styles or STBs leads to reduced statistical power to detect an association (Altman & Royston, 2006). However, it is also possible that continuous measures more accurately capture subtle individual differences according to contemporary conceptualizations of attachment styles and STBs as differing quantitatively rather than qualitatively (Brennan et al., 1998; Silverman et al., 2007). As such, future research should prioritize the use of dimensional measurement models and continuous scoring methods for both attachment styles and STBs to improve statistical power and/or measurement precision.

The inclusion of studies across two measurement traditions of attachment style introduced significant methodological heterogeneity in the analyses. Although inclusion of these two measurement traditions in the analyses was selected to better represent the complexity of the literature on the association between attachment styles and STBs, this decision led to the manipulation of different types of data to combine studies across measurement models and scoring methods. It is noteworthy that approximately 2/3 of included effects required data manipulation and multi-step transformations to obtain an effect size which could be interpreted across studies. Transformation of data across effect sizes is an acceptable practice in meta-analysis (Borenstein et al., 2009; Polanin & Snilvsteit, 2016). Nonetheless, significant heterogeneity was observed across continuous and categorical measurement methods and data types, but also within subgroups of studies. Further, studies reporting continuous data produced larger effects than those studies reporting categorical data. However, despite differences in magnitude and large heterogeneity, main findings were consistent across measurement models. As such, while this methodological heterogeneity may have been inflated by the current inclusion criteria, this study also attempted to provide a best possible estimate of the association between attachment styles and STBs based on all the available evidence.

Additional limitations related to this meta-analysis include the aggregation of multiple effects per study, the undetected effects of publication bias, and the largely cross-sectional nature of this literature. Specifically, given the two-dimensional and four-categorical operationalizations of attachment style, studies could provide relevant information for up to three different effect sizes per analysis. Although inherent to the current conceptualizations of attachment (in)security, the inclusion of non-independent effect sizes may have biased meta-analytic estimates. The inclusion of both published journal articles and unpublished dissertations

may have contributed to minimizing publication bias in the current analyses (Franco et al., 2014). Although unpublished dissertations did tend to report overall associations between attachment styles and STBs of similar magnitude compared to published, peer-reviewed studies, evidence of publication bias was found in the present review. Additionally, some potential study variables were too underpowered to test as moderators (e.g. geographic region) or did not have available or comparable information across all studies (e.g. socioeconomic status and racial/ethnic identification). Thus, these were used for descriptive purposes but could not be included in the present analyses. Although the general replication of moderation results across measurement models provides preliminary insight into potential clinical and methodological variables to consider in the association between attachment styles and STBs, further research is needed to better understand moderating factors related to ethnic, geographical, socioeconomic, and cultural differences on the association between attachment style and STBs. Finally, a large majority of studies included in this study used cross-sectional designs. Among the few available longitudinal studies, similar trends to the cross-sectional results were observed, albeit of smaller magnitude. For attachment style to be established as a true risk factor for STBs, longitudinal designs are required to determine how attachment styles are differentially associated with lower or higher risk for STBs over time, and to clarify the directionality of this association (Franklin et al., 2017).

These findings may have implications for interventions among individuals presenting with STBs. The differential associations between attachment styles and STBs observed in the current review suggest that attachment-based interventions may be relevant in the treatment of STBs. Results from clinical trials of attachment-based family therapy with suicidal adolescents have supported the utility of this approach in the reduction of suicidal thoughts (Diamond et al.,

2012, 2013; Scott et al., 2016; Shpigel et al., 2012). Attachment-based interventions have also been recommended with chronically suicidal adults (Gormley, 2004). Further, researchers should examine psychological moderators and mediators of the association between attachment styles and STBs (Green et al., 2020) as potential targets for clinical interventions. For example, among individuals with high attachment anxiety, cognitive restructuring targeting hypervigilance to interpersonal threat, fears of rejection, and perceptions of social disconnectedness as well as behavioural strategies to correct maladaptive hyper-activating intimacy-seeking patterns may be helpful. In contrast, avoidantly- and fearfully-attached individuals may benefit more from interventions targeting deactivating intimacy-avoiding patterns in order to rebuild a sense of belongingness. This is line with studies indicating that the association between avoidant attachment and suicide attempts was mediated by less self-disclosure and lack of sociability (*Levi-Belz et al., 2018; *Stepp et al., 2008; see Green et al., 2020 for review). Treatment studies are needed to test these hypotheses.

In conclusion, the present meta-analysis highlights that attachment insecurity is a risk factor for STBs, with attachment anxiety being more strongly associated with STBs than attachment avoidance. Contemporary theoretical models of suicide highlight the role of social disconnection, and burdensomeness as important factors enhancing emotional pain and STBs. Future longitudinal research is required to test potential interpersonal and emotional mechanisms linking attachment style and STBs. In addition, research on attachment style and STBs should consider the use of dimensional conceptualizations and validated, continuous measurement of attachment and STBs to better detect attachment-related differences in suicidality.

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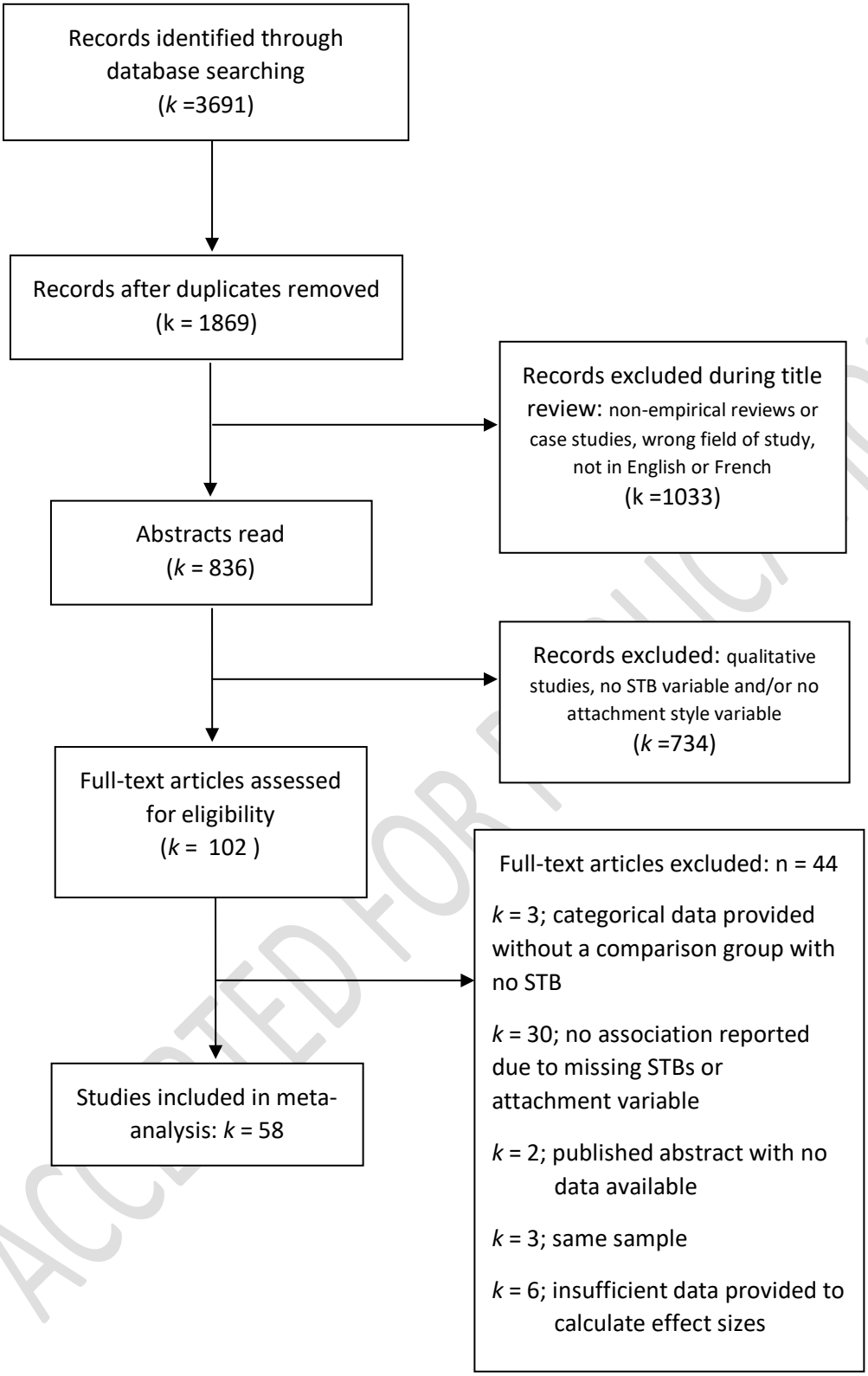

Figure 1. PRISMA Flow Chart for article selection.

K = number of studies; STBs = Suicidal thoughts and behaviours

Table 1. Main effects and moderating effects of the association between categorical conceptualization of *secure attachment* and STBs.

STBs	***Main*** (Moderating) **effects**	**Levels**	**k**	**Effects**	**Hedges' g (SE)**	**95% CI**	I^2	Q (df)
Thoughts			***21***[a]	***21***	***-0.456 (0.082)******	***-0.616, -0.296***	***81.933***	
	Sample Type	Clinical	10	10	-0.290 (0.074)***	-0.435, -0.145	31.924	4.356 (1)*
		Community	11	11	-0.576 (0.115)***	-0.802, -0.350	86.891	
	Sample Severity	Suicidal	2	2	-0.224 (0.144)	-0.505, 0.058	0.000	2.251 (1)
		Non-Suicidal	19	19	-0.475 (0.087)***	-0.645, -0.306	83.145	
	Developmental Stage	Adolescents	6	6	-0.495 (0.108)***	-0.706, -0.283	60.590	4.727 (2)‡
		Adults	12	12	-0.476 (0.130)***	-0.731, -0.221	87.023	
		Mixed	3	3	-0.234 (0.082)**	-0.394, -0.074	0.000	
	STB Scoring	Categorical	7	7	-0.124 (0.072)‡	-0.266, 0.018	0.000	15.887 (1)***
		Continuous	14	14	-0.590 (0.092)***	-0.770, -0.410	82.635	
	Attachment Scoring	Categorical	7	7	-0.365 (0.138)**	-0.636, -0.095	56.447	0.552 (1)
		Continuous	14	14	-0.493 (0.101)***	-0.691, -0.294	86.571	
	Publication Type	Journal Article	18	18	-0.452 (0.088)***	-0.625, -0.280	84.363	0.001 (1)
		Dissertation	3	3	-0.446 (0.164)**	-0.766, -0.125	0.000	
Attempts			***12***	***12***	***-0.337 (0.090)******	***-0.514, -0.161***	***39.989***	
	Sample Type	Clinical	9	9	-0.274 (0.086)***	-0.443, 0.106	0.000	0.347 (1)
		Community	3	3	-0.431 (0.251)‡	-0.922, 0.061	83.444	
	Sample Severity	Suicidal	5	5	-0.298 (0.103)**	-0.499, -0.096	0.000	0.126 (1)
		Non-Suicidal	7	7	-0.363 (0.153)**	-0.663, -.063	61.087	
	Developmental Stage	Adolescents	5	5	-0.132 (0.143)	-0.412, 0.148	0.000	2.133 (2)
		Adults	6	6	-0.415 (0.136)**	-0.681, -0.149	63.353	
		Mixed	1	1	-0.351 (0.239)	-0.821, 0.118	0.000	
	STB Measurement	Categorical	10	10	-0.283 (0.081)***	-0.442, -0.124	0.000	0.229 (1)
		Continuous	2	2	-0.466 (0.374)	-1.198, 0.266	91.671	
	Attachment Measurement	Categorical	8	8	-0.190 (0.086)*	-0.359, -0.020	0.000	2.605 (1)
		Continuous	4	4	-0.509 (0.178)**	-0.858, 0.160	65.573	
	Publication Type	Journal Article	6	6	-0.463 (0.174)**	-0.805, -0.121	60.860	1.665 (1)
		Dissertation	6	6	-0.210 (0.090)*	-0.387, 0.033	0.000	

$^{\dagger}p$ <.1, * p <.05, ** p <.01, *** p <.001; Levels = Categorical moderator groups; k = number of studies; Effects = number of effects included in the analysis group; Hedge`s g = effect size; SE = standard error; I^2 = I-squared, percentage of variability in effect sizes associated with true heterogeneity between studies within the analysis; Q = subgroup analysis akin to analysis of variance to evaluate differences in effect sizes between levels of moderator; df = degrees of freedom.

[a] Of the 33 studies measuring categorical attachment styles, three studies reported associations for secure attachment style only and two studies reported associations for fearful attachment style only, resulting in differences in the number of studies included in each categorical attachment style analysis.

Table 2. Main effects and moderating effects of the association between categorical conceptualization of *insecure attachment* and STBs.

STBs	***Main*** (Moderating) **effects**	**Levels**	**k**	**Effects**	**Hedges' g (SE)**	**95% CI**	I^2	Q (df)
Thoughts			***20[a]***	***47***	***0.340 (0.058)****	***0.226, 0.454***	***83.539***	
	Attachment Style	Dismissing	18	18	0.224 (0.115)*	0.012, 0.437	86.689	1.882 (2)
		Preoccupied	18	18	0.406 (0.107)***	0.197, 0.615	85.938	
		Fearful	11	11	0.390 (0.080)***	0.234, 0.547	66.044	
	Sample Type	Clinical	10	23	0.238 (0.078)**	0.086, 0.391	70.083	2.649 (1)
		Community	10	24	0.423 (0.083)***	0.261, 0.585	88.439	
	Sample Severity	Suicidal	2	3	0.222 (0.147)	-0.066, 0.510	0.000	0.589 (1)
		Non-Suicidal	18	44	0.344 (0.060)***	0.225, 0.462	84.574	
	Developmental Stage	Adolescents	4	11	0.279 (0.162)[†]	-0.038, 0.597	83.640	4.420 (2)
		Adults	13	27	0.404 (0.079)***	0.249, 0.559	86.580	
		Mixed	3	9	0.182 (0.070)***	0.044, 0.319	45.151	
	STB Measurement	Categorical	8	18	0.139 (0.068)*	0.006, 0.273	39.510	8.189 (1)**
		Continuous	12	29	0.428 (0.075)***	0.282, 0.574	88.009	
	Attachment Measurement	Categorical	7	17	0.313 (0.114)**	0.089, 0.537	59.170	0.079 (1)
		Continuous	13	27	0.350 (0.067)***	0.218, 0.482	87.641	
	Publication Type	Journal Article	17	39	0.340 (0.061)***	0.220, 0.460	85.535	0.000 (1)
		Dissertation	3	8	0.339 (0.205)[†]	-0.063, 0.741	57.478	
Attempts			***14***	***32***	***0.229 (0.044)****	***0.144, 0.315***	***10.531***	
	Attachment Style	Dismissing	12	12	0.070 (0.073)	-0.073, 0.213	0.000	6.684 (2)*
		Preoccupied	12	12	0.300 (0.070)***	0.163, 0.437	0.000	
		Fearful	7	8	0.330 (0.102)***	0.129, 0.530	52.851	
	Sample Type	Clinical	11	23	0.224 (0.053)***	0.121, 0.327	0.000	0.004 (1)
		Community	3	9	0.230 (0.084)**	0.065, 0.396	40.898	
	Sample Severity	Suicidal	6	13	0.214 (0.076)**	0.065, 0.363	24.840	0.117 (1)
		Non-Suicidal	8	19	0.245 (0.076)***	0.142, 0.349	1.995	
	Developmental Stage	Adolescents	5	11	0.148 (0.113)	-0.074, 0.370	0.000	0.954 (2)
		Adults	8	18	0.243 (0.060)***	0.125, 0.362	42.493	
		Mixed	1	3	0.350 (0.194)[†]	-0.030, 0.729	0.000	
	STB Scoring	Categorical	12	26	0.233 (0.051)***	0.134, 0.332	0.000	0.044 (1)
		Continuous	2	6	0.209 (0.104)*	0.006, 0.412	60.175	
	Attachment Scoring	Categorical	8	19	0.155 (0.066)*	0.026, 0.285	0.000	1.507 (1)
		Continuous	6	13	0.273 (0.070)***	0.136, 0.411	44.763	
	Publication Type	Journal Article	8	18	0.270 (0.065)***	0.142, 0.398	32.124	1.453 (1)

Dissertation	6	14	0.156 (0.068)*	0.023, 0.290	0.000

[‡] p <.1, * p <.05, ** p <.01, *** p <.001; Levels = Categorical moderator groups; k = number of studies; Effects = number of effects included in the analysis group; Hedge`s g = effect size; *SE* = standard error; I^2 = I-squared, percentage of variability in effect sizes associated with true heterogeneity between studies within the analysis; Q = subgroup analysis akin to analysis of variance to evaluate differences in effect sizes between levels of moderator; *df* = degrees of freedom.

[a] Of the 33 studies measuring categorical attachment styles, three studies reported associations for secure attachment style only and two studies reported associations for fearful attachment style only, resulting in differences in the number of studies included in each categorical attachment style analysis.

Table 3. Main effects and moderating effects of the association between *dimensional* conceptualization of attachment styles and STBs.

STBs	***Main*** (Moderating) **effects**	**Levels**	**k**	**Effects**	**Hedges' g (SE)**	**95% CI**	I^2	Q (df)
Thoughts			***10***	***19***[a]	***0.407 (0.088)****	***0.235, 0.579***	***83.096***	
	Attachment Style	Anxiety	10	10	0.573 (0.111)***	0.356, 0.789	78.351	4.011 (1)*
		Avoidance	9	9	0.218 (0.138)	-0.053, 0.489	85.100	
	Sample Type	Clinical	7	13	0.250 (0.089)**	0.075, 0.425	63.917	11.852 (1)***
		Community	3	6	0.720 (0.103)***	0.518, 0.922	77.184	
	Sample Severity	Suicidal	3	6	0.116 (0.075)	-0.031, 0.262	0.000	12.892 (1)***
		Non-Suicidal	7	13	0.550 (0.095)***	0.364, 0.737	80.611	
	Developmental Stage	Adolescents	2	4	0.115 (0.095)	-0.073, 0.302	14.465	8.023 (1)***
		Adults	8	15	0.492 (0.093)***	0.310, 0.674	81.457	
		Mixed	0	0				
	STB Measurement	Categorical	3	6	0.354 (0.190)[ǂ]	-0.018, 0.725	77.944	0.116 (1)
		Continuous	7	13	0.427 (0.101)***	0.230, 0.624	84.795	
	Publication Type	Journal Article	9	17	0.377 (0.101)***	0.179, 0.576	83.530	0.874 (1)
		Dissertation	1	2	0.597 (0.212)**	0.182, 1.012	88.692	
Attempts			***14***	***28***	***0.420 (0.083)****	***0.257, 0.584***	***86.409***	
	Attachment Style	Anxiety	14	14	0.581 (0.108)***	0.370, 0.792	83.246	4.151 (1)*
		Avoidance	14	14	0.261 (0.114)*	0.036, 0.485	85.749	
	Sample Type	Clinical	10	20	0.330 (0.098)***	0.138, 0.522	85.705	5.425 (1)*
		Community	4	8	0.661 (0.103)***	0.459, 0.864	70.357	
	Sample Severity	Suicidal	2	4	0.578 (0.108)***	0.367, 0.789	0.000	1.654 (1)
		Non-Suicidal	12	24	0.395 (0.093)***	0.213, 0.577	88.197	
	Developmental Stage	Adolescents	2	4	0.413 (0.286)	-0.148, 0.974	85.964	4.723 (1)[ǂ]
		Adults	11	22	0.385 (0.092)***	0.205, 0.566	85.950	
		Mixed	1	2	0.787 (0.161)***	0.470, 1.103	73.800	
	STB Measurement	Categorical	7	14	0.352 (0.120)**	0.116, 0.588	88.347	0.847 (1)
		Continuous	7	14	0.497 (0.103)***	0.296, 0.699	79.402	
	Publication Type	Journal Article	11	22	0.395 (0.093)***	0.213, 0.577	86.051	0.284 (1)
		Dissertation	3	6	0.510 (0.195)**	0.129, 0.891	88.122	

[ǂ] p <.1, * p <.05, ** p <.01, *** p <.001; Levels = Categorical moderator groups; k = number of studies; Effects = number of effects incuded in the analysis group; Hedge`s g = effect size; *SE* = standard error; I^2 = I-squared, percentage of variability in effect sizes associated with true heterogeneity between studies within the analysis; Q = subgroup analysis akin to analysis of variance to evaluate differences in effect sizes between levels of moderator; *df* = degrees of freedom.

[a] One study provided sufficient information to compute an effect size only for the anxious attachment dimension, whereas other studies included both anxious and avoidant attachment.

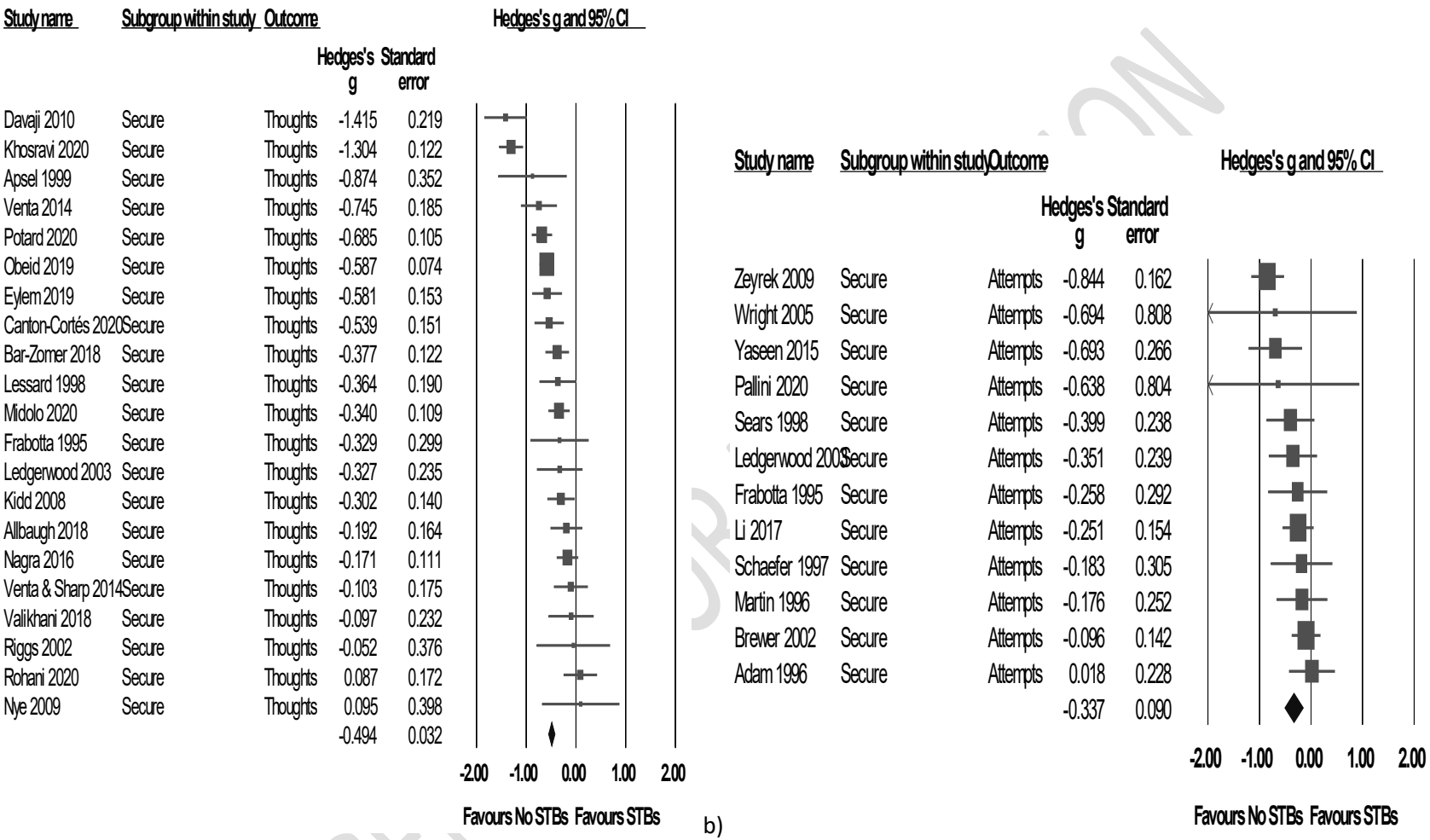

Figure 2. Cross-sectional associations between categorical secure attachment style and STBs. Panel A depicts the association between secure attachment and suicidal *thoughts*. Panel B depicts the association between secure attachment and suicide *attempts*.

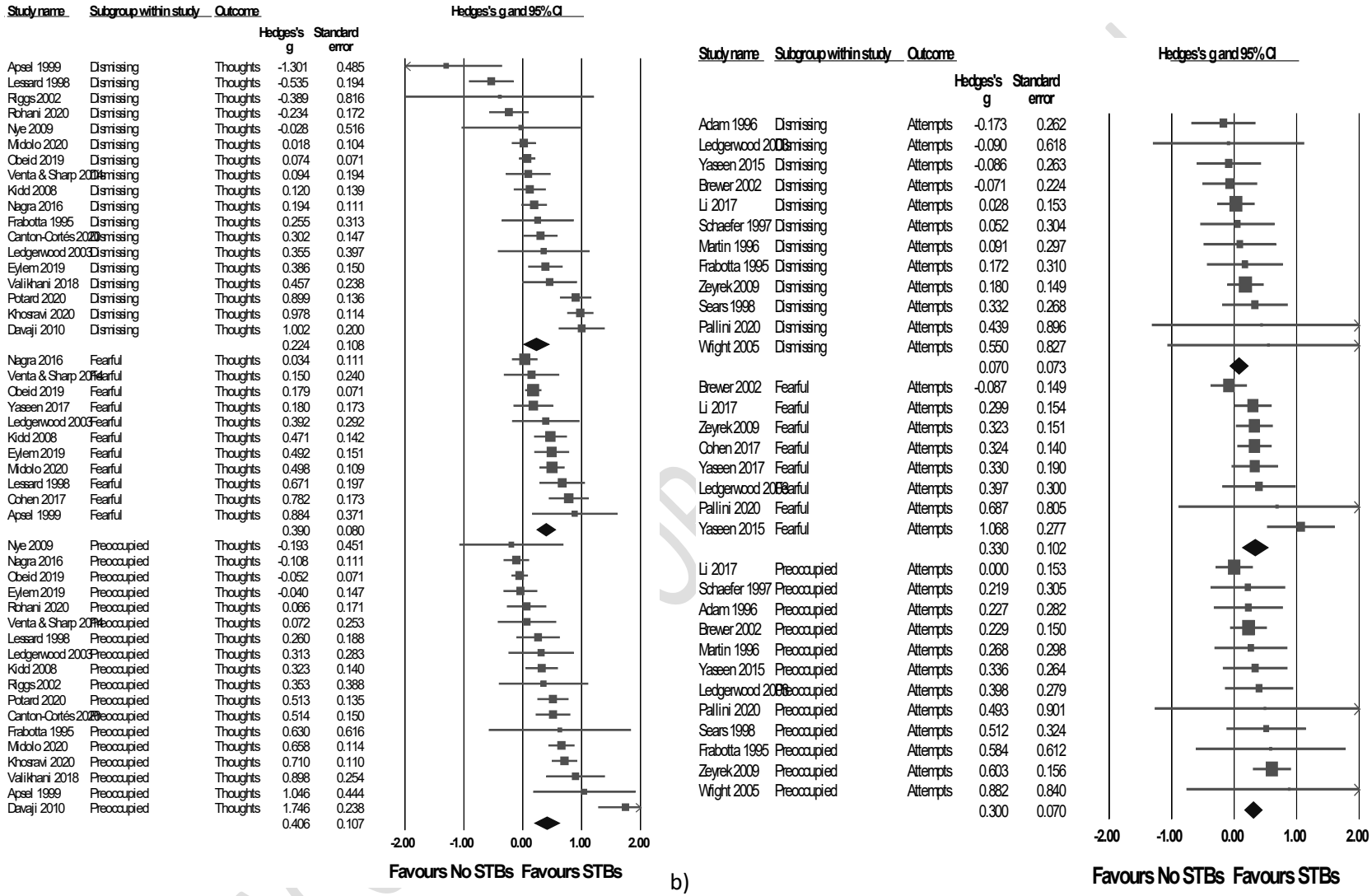

Figure 3. Cross-sectional associations between categorical insecure attachment styles and STBs. Panel A represents the associations between insecure attachment styles and suicidal *thoughts*. Panel B represents the associations between insecure attachment styles and suicide *attempts*. The dark diamonds represent the overall estimate per attachment style.

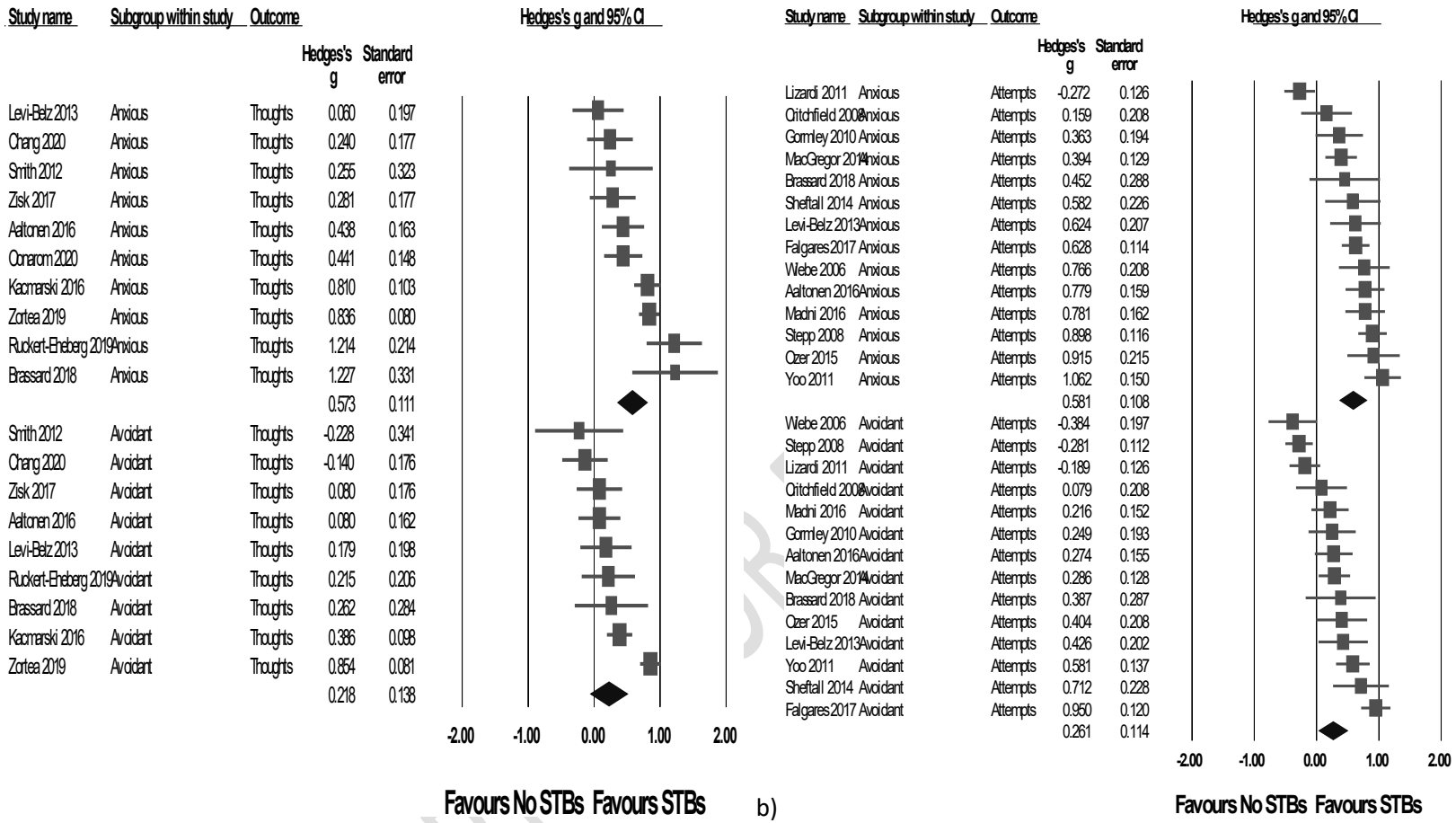

Figure 4. Cross-sectional associations between dimensional insecure attachment styles and STBs. Panel A represents the associations between insecure attachment styles and suicidal *thoughts*. Panel B represents the associations between insecure attachment styles and suicide *attempts*. The dark diamonds represent the overall estimate per attachment style.

Figure 1. Multitrajectories of externalizing and internalizing childhood problems from age 6-12