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Preoccupied and Dismissing Attachment Representations Are Differentially Associated With Anxiety in Adolescence and Adulthood: A Meta-Analysis

Or Dagan[1], Christopher R. Facompré[1], Marissa D. Nivison[2], Glenn I. Roisman[2], and Kristin Bernard[1]
[1]Department of Psychology, Stony Brook University, and [2]Institute of Child Development, University of Minnesota

Abstract
The claim that insecure attachment predisposes individuals to anxiety was put forth by attachment theorists more than 45 years ago, yet evidence of this association has produced mixed results. By conducting a series of meta-analyses (k = 53, N = 4,970), we found that individuals with secure and insecure attachment representations did not differ in their reported anxiety symptoms. However, individuals with preoccupied (d = 0.35) but not dismissing attachment representations (d = −0.02) endorsed significantly more anxiety symptoms than secure individuals. Individuals with preoccupied attachment representations also endorsed greater anxiety symptoms than people with dismissing attachment representations (d = 0.31), and this difference was stronger when assessed in high-risk samples than low-risk samples. Unresolved individuals were more anxious than nonunresolved individuals (d = 0.29), but exploratory analysis suggested that secondary preoccupied attachment subtype drove this effect. Results highlight the relevance of attachment representations for prevention and intervention efforts targeting anxiety.

Keywords
attachment, anxiety, meta-analysis

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Since the emergence of the discipline of clinical psychology at the end of the 19th century, anxiety has been thought of as central to most, if not all, psychopathological disorders (Crocq, 2015, 2017). It is thus of little surprise that anxiety symptoms have not only been a core diagnostic feature of internalizing disorders (Eaton et al., 2013) and highly correlated with externalizing disorders (Bubier & Drabick, 2009; Cosgrove et al., 2011) but also that anxiety disorders have been one of the most prevalent diagnosed mental illnesses across the life span; approximately 1 in 15 people are diagnosed with anxiety disorder every year globally (Steel et al., 2014)—the highest of all mental disorders. Depending on the anxiety disorder and the population assessed, lifetime prevalence of anxiety falls anywhere between 3.8% and 25% (Remes, Brayne, Van Der Linde, & Lafortune, 2016). Moreover, some studies have suggested that subthreshold anxiety disorders may be 3 times as prevalent as anxiety disorders that fully meet the criteria (Angst, Merikangas, & Preisig, 1997; Balázs et al., 2013). Anxiety is one of the leading causes of poor health and mortality across all mental disorders (Simpson, Neria, Lewis-Fernandez, & Schneier, 2010; Walker, McGee, & Druss, 2015); second to depression, anxiety causes the most years lost because of ill health, disability, or early death (Kessler, Petukhova, Sampson, Zaslavsky, & Wittchen, 2012; Whiteford et al., 2013). It has thus become increasingly clear that the etiology and maintenance of anxiety are of great clinical importance.

Corresponding Author:
Or Dagan, Department of Psychology, Stony Brook University, Stony Brook, NY 11794
E-mail: or.dagan@stonybrook.edu

Individuals who experience anxiety often have chronic thoughts characterized by overestimation of threats and harm (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007; Garnefski & Kraaij, 2018). These chronic thoughts tend to manifest in interpersonal contexts; as such, interpersonal mechanisms play a role in the emergence of anxiety symptoms (Diamond & Aspinwall, 2003; Nolte, Uiney, Fonagy, Mayes, & Luyten, 2011), which emphasizes the relational nature of anxiety symptoms. The interpersonal aspect of anxiety may be understood in one of two ways. First, anxiety may arise from interpersonal interactions that are perceived as threatening, which contributes to anxiety disorders such as social anxiety (e.g., when one fears being criticized by others; Alden & Taylor, 2010) and separation anxiety disorder (e.g., when people fear that attachment figures may be harmed when separated from them; Bögels, Knappe, & Clark, 2013). Second, anxiety may arise from the sense that support from others may be difficult to solicit or unavailable altogether when under threat (Cassidy, 1995; Mikulincer & Shaver, 2012; Thompson, 2001).

Attachment theory proposes a comprehensive approach to understanding the formation of representations of interpersonal experiences with one's caregivers under distress (Atkinson & Goldberg, 2003; Bowlby, 1951; Mikulincer & Shaver, 2012). Given that chronic distress may cause anxiety (McEwen et al., 2015; Patriquin & Mathew, 2017), attachment theory offers a critical framework for better understanding the etiology of anxiety symptoms.

From Early Distress About Unavailability of Caregivers to Anxiety Symptoms

From an attachment theory perspective, anxiety across the life span is understood to be rooted in early anxiety regarding the availability of attachment figures (Bowlby, 1973; Sroufe, 1996). Put another way, when caregivers are unavailable or insensitive, children may experience worry or anxiety about their inability to solicit support during times of distress. In such rearing environments, children may adopt "second-best" attachment strategies aimed to attenuate anxiety (Main, 1981, 1990). Some children may maximize their chances of soliciting support from the caregiver by both profusely protesting the caregiver's previous absence and attempting to prevent the caregiver from leaving again (also referred to as hyperactivating attachment strategies; R. R. Kobak, 1993). Other children may minimize the distress that accompanies their perceived inability to solicit support from the caregiver by shifting attention away from the source of threat (also referred to as deactivating attachment strategies; R. R. Kobak, 1993).

Although hyperactivating and deactivating strategies may be adaptive in an environment in which support is unlikely to be available, chronically relying on such strategies may, in interaction with other intrapersonal and interpersonal factors, lead to appraising threats as overwhelming (Britton, Lissek, Grillon, Norcross, & Pine, 2011; Mineka & Zinbarg, 2006) and thus to anxiety symptoms later in life (Carlson & Sroufe, 1995; Cassidy, 1995; Esbjørn, Bender, Reinholdt-Dunne, Munck, & Ollendick, 2012; Kerns & Brumariu, 2014). Specifically, it has been proposed that the inability of insecurely attached individuals to effectively *regulate emotions* at times of distress may lead to anxiety symptoms (Esbjørn et al., 2012; Kerns & Brumariu, 2014; Nolte et al., 2011; Sroufe, Duggal, Weinfield, & Carlson, 2000; Thompson, 2001).

Emotion regulation refers to the ability to "influence which emotions we have, when we have them, and how we experience and express them" (Gross, 1998, p. 275) and is thought to develop early in life via repeated infant/child-caregiver interactions at times of distress (Sroufe et al., 2000). Given that anxiety often entails difficulties managing emotional arousal and the intense experience of negative emotions (Gross, 2015) and that attachment behaviors are at their core geared toward regulating negative emotions (e.g., seeking comfort; Thompson, 2001), developing insecure attachment early in life may lead to chronic inability to mitigate distress and arousal. Prolonged distress and arousal, in turn, may expose insecurely attached individuals to anxiety symptoms. Indeed, some studies have suggested that insecure infants have been shown to more frequently develop anxiety later in childhood and adolescence compared with their secure peers (Bar-Haim, Dan, Eshel, & Sagi-Schwartz, 2007; Bosquet & Egeland, 2006; Brumariu & Kerns, 2013; Colonnesi et al., 2011; Manassis, 2001; Stuart Parrigon & Kerns, 2016; Warren, Huston, Egeland, & Sroufe, 1997), although meta-analytic evidence suggests this association is weak in magnitude (e.g., $d = 0.15$; Groh et al., 2012).

Attachment Representations

Repeated early experiences that children have with caregivers at times of need give rise to mental representations of attachment (Bowlby, 1973; Bretherton & Munholland, 2008). These attachment representations have been thought to entail a model of emotions and expectations with respect to oneself and others that shapes adult interpersonal behavior at times of distress (Bretherton, 1985, 1991, 1992; Sroufe, Egeland, Carlson, & Collins, 2005; Sroufe & Waters, 1977). The most widely used objective assessment of attachment representations

in adolescence and adulthood is the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985).

The AAI is a semistructured interview about one's early experiences with primary caregivers that includes questions that pertain to both the quality of such experiences as well as their influence on who the speaker is at present. The AAI measures attachment patterns by assessing the quality or "coherence" of the speaker's discourse (Hesse, 2016). In this context, attentional flexibility or inflexibility—a hallmark of anxiety or lack thereof (Mogg & Bradley, 2016; Pacheco-Unguetti, Acosta, Callejas, & Lupiáñez, 2010)—can be observed in adults' discourse during the AAI. Securely attached individuals can fluidly shift their focus between their memories of attachment-related experiences and respond to AAI questions in a collaborative manner (e.g., consistent or truthful), such as to evaluate the influences of these past experiences on the speaker's present personality (Hesse, 2016). This capacity for attentional flexibility is thought to reflect a relative *absence* of attentional biases that is often observed in anxious individuals (Cisler & Koster, 2010; Ferreri, Lapp, & Peretti, 2011). However, individuals classified as insecurely attached on the AAI tend to exhibit attentional inflexibility. For example, such individuals tend to exhibit discourse that is irrelevant to the topic at hand (e.g., not directly answering the question) or not matching the expected quality of information provided (e.g., excessively succinct or angrily elaborative). Accordingly, instead of collaborating with the interviewer on the present interview task, insecurely attached individuals are thought to rigidly direct their cognitive effort to regulating their emotions in face of attachment-related anxiety, associated with memories about past and present distressful experiences with their primary caregivers (Main, 2000).

Insecure-dismissing (hereafter, dismissing) individuals tend to use deactivating strategies when presented with the AAI questions; they turn away from past negative experiences by either idealizing their caregivers without substantiating their idealization with concrete examples (and sometimes insist on lack of recall) or exhibiting brief derogation of their caregivers (Hesse, 2016) followed by reluctance to elaborate further. In contrast, insecure-preoccupied (hereafter, preoccupied) individuals tend to use hyperactivating strategies when asked about the past experiences with their parents. Exhibiting high-frequency or intense anger, confusion, or fearfulness during the AAI is common in preoccupied individuals, who are overinvolved with negative past and present experiences (Hesse, 2016).

Finally, a disorganized classification—referred to as unresolved—may be assigned on the basis of an individual's responses during AAI. Unresolved attachment in adulthood manifests as disorientation when under distress; for unresolved adults, disorientation is exhibited as lapses in monitoring of reasoning or discourse during discussion of past loss or abuse (Hesse & Main, 2006). An unresolved classification is assigned in addition to one of the primary organized classifications (i.e., secure, dismissing, and preoccupied), although it should be noted that large-sample factor analyses of the AAI have reliably reported that indicators of unresolved attachment and indicators of preoccupied attachment load on a common construct (e.g., Haltigan, Roisman, & Haydon, 2014; Roisman & Cicchetti, 2017).

Attachment Representations and Anxiety: A Brief Review of Findings

Despite the rich theoretical underpinning and nearly four decades of research on adult attachment and psychopathology, only a few studies have reported on the link between attachment representations and anxiety symptoms. Brumariu, Obsuth, and Lyons-Ruth (2013) explored the association between attachment representations and anxiety among older adolescents with anxiety disorders. The authors reported that insecure and unresolved attachment patterns were more represented in a group of individuals with anxiety disorders than a group with no psychopathological diagnoses. Another study assessed adults diagnosed with anxiety disorders to examine potential mechanisms by which insecurely attached individuals selectively process threatening information (Van Emmichoven, Van IJzendoorn, De Ruiter, & Brosschot, 2003). Results suggested that securely attached patients with anxiety disorders showed larger emotional Stroop task interference for threatening words and better recall for threatening words than their insecure counterparts. The authors suggested that securely attached patients were more focused on and open to processing threatening words and less defensive than insecurely attached patients. Accordingly, the authors concluded that insecure attachment in general, but not subtypes of insecurity (i.e., preoccupied and dismissing), is associated with anxiety-related attention and memory-defensive processes.

Other studies have reported that individuals classified with preoccupied (but not dismissing) and unresolved attachment representations were overrepresented in adults with anxiety disorders (e.g., Fonagy et al., 1996; Manassis, Bradley, Goldberg, Hood, & Swinson, 1994; Rosenstein & Horowitz, 1996; Stovall-McClough & Cloitre, 2006). A few studies that assessed the link between AAI classifications and anxiety symptoms in nonclinical populations (e.g., Adam, Gunnar, & Tanaka,

2004; R. R. Kobak & Sceery, 1988; Pianta, Egeland, & Adam, 1996) have reported similar results.

Note that one meta-analysis reported the distribution of AAI classifications in samples of individuals diagnosed with internalizing disorders (Bakermans-Kranenburg & Van IJzendoorn, 2009), which tend to include anxiety symptoms (e.g., Krueger & Markon, 2006). In studies comparing nonclinical and internalizing disorder samples, preoccupied attachment was overrepresented in all participants with internalizing disorders, and unresolved attachment was overrepresented in individuals diagnosed with borderline personality disorder or with a history of severe suicidal ideation. However, this meta-analytic study was limited in its ability to test specific associations between attachment representations and anxiety symptoms given that it only included one study with an anxiety-disordered sample. Moreover, associations between attachment representations and anxiety symptoms in nonclinical populations were not examined.

Taken together, research suggests that adolescents and adults classified with unresolved and insecure attachment representations are more prone to anxiety symptoms and anxiety disorders than securely attached individuals. However, significant gaps in this literature remain. First, as noted by Fortuna and Roisman (2008), most of the studies that reported on the link between attachment representations and psychopathology, including anxiety, did so by studying clinical samples. Given that many individuals experience significant levels of distress that fall short of categorical diagnosis but require mental health care (Helmchen & Linden, 2000; Kotov et al., 2017), examining the link between adult attachment patterns and anxiety symptoms within nonclinical samples is critical. By leveraging unpublished data from the large number of studies that measured attachment along with broad based measures of psychopathology (e.g., Symptom Checklist 90; Derogatis & Cleary, 1977) in nonclinical samples, the association between attachment classifications and anxiety symptoms in such samples can be estimated alongside the published results regarding clinical samples. Second, increasing evidence has identified psychopathology as dimensional rather than categorical (e.g., Haslam, Holland, & Kuppens, 2012; Widiger & Samuel, 2005; Wright et al., 2013). Thus, there is a need to summarize and quantify findings regarding the link between attachment representations and dimensionally assessed anxiety symptoms. Third, it is still unclear whether risk for developing anxiety symptoms differs between individuals classified as dismissing versus preoccupied attachment subtypes (Groh et al., 2012). As argued before (Kerns & Brumariu, 2014; Stovall-McClough & Dozier, 2016), understanding whether the different insecure subtypes carry differential risk for developing anxiety may inform attachment-based prevention and intervention efforts.

The Current Study

In this meta-analysis, we aimed to quantify the magnitude of the association between attachment representations and anxiety symptoms in both clinical and nonclinical samples. Following previous meta-analyses (Colonessi et al., 2011; Dagan, Facompré, & Bernard, 2018; Madigan, Atkinson, Laurin, & Benoit, 2013), we compared anxiety symptoms between the following attachment groups: (a) insecure and secure individuals, (b) dismissing and secure individuals, (c) preoccupied and secure individuals, (d) preoccupied and dismissing individuals, and (e) unresolved and organized individuals. We also compared anxiety symptoms between (f) unresolved/dismissing and unresolved/preoccupied individuals to assess whether differences between insecure attachment patterns emerged above and beyond unresolved status.

Given that dismissing and preoccupied attachment representations are thought to reflect ineffective and inflexible strategies for regulating distress (Main, 2000; Shaver & Mikulincer, 2007), we hypothesized that insecure individuals would show higher rates of anxiety than secure individuals. We also predicted that preoccupied individuals would report more anxiety than dismissing individuals given that this pattern emerged in related meta-analytic work with depression (Dagan, Facompré, & Bernard, 2018). Lastly, we hypothesized that individuals with unresolved attachment patterns would exhibit more anxiety symptoms than individuals with organized attachment patterns.

We examined several sample characteristics as potential moderators. Given established associations with anxiety symptoms, we examined whether the association between attachment and anxiety symptoms was moderated by demographic variables, including age, biological sex, parental status, ethnicity, socioeconomic status (SES), education, and author-identified risk status (Carter, Mitchell, & Sbrocco, 2012; McLean, Asnaani, Litz, & Hofmann, 2011; Orcutt, Garcia, & Pickett, 2016). Moreover, we considered two methodological factors as potential moderators. The first was the AAI coding system from which attachment representations were drawn. That is, we compared the traditional Main classification coding system (George et al., 1985) with Kobak's Q-set coding system (R. R. Kobak, 1993; R. R. Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993). The second potential methodological moderator we considered was the time interval between AAI and anxiety symptoms assessment, given that anxiety symptoms may change over time.

Method

Literature search

Peer-reviewed articles and dissertations examining the association between attachment representations and anxiety disorders and symptoms were retrieved for inclusion in this meta-analysis. The electronic databases PsycINFO, PubMed, and ProQuest were first searched in November 2018 (and again in March 2019) using some combination of the following keywords: attach* or "attachment behavior" or "adult attachment interview" or "AAI" or representation* or "mentalization" or "preoccupied" or "dismissing" AND anx* or psychopath* or "mental disorder" or "stress" or "symptom" or "distress" or "Achenbach Child Behavior Checklist" or "Symptom Checklist-90" or "Mental Health Inventory" or "Structured Clinical Interviews" or "Beck Anxiety Inventory" or "Brief Symptom Inventory" or "State-Trait Anxiety Inventory" or "State Trait Anxiety Inventory" or "Hospital Anxiety and Depression Scale." Clinical case studies, pilot studies, and systematic reviews were excluded. No date or geographical restrictions were applied; however, studies were limited to those published in the English language. We also reviewed the reference sections of relevant research articles and book chapters to identify studies that may not have been retrieved through our electronic search.

References of 3,071 studies were imported into the online systematic review manager, Covidence, for screening, and 17 additional studies were identified through other sources. After removing duplicate reports, 1,244 studies were evaluated for study relevance on the basis of the title and abstract. When study relevance could not be gleaned, the full-text article was screened. Four hundred sixty-four full-text articles were reviewed, and 426 failed to meet the inclusion criteria. In some cases, multiple articles presented data on the same set (or subset) of participants. When duplicate samples were identified, we selected and cited the study with the largest sample and excluded the others to avoid redundancy. If more than one article reported the same sample size, we cited the more recent one. This process resulted in a final set of 37 studies (53 samples) that met inclusion criteria for at least one meta-analytic comparison (see Fig. 1).

It is noteworthy that several studies recruited and combined multiple independent subgroups to maximize statistical power. For the purpose of meta-analysis, potentially meaningful sample differences can become obscured when combined. We therefore requested that (when possible) authors send the raw data for each sample so that effect-size estimates could be computed and entered into the meta-analysis separately.

We also identified several studies that reported codable effects from one or more dependent samples (e.g., anxiety and attachment measures were administered to romantic couples). Dependent samples can produce biased sample estimates when simultaneously supplied to meta-analysis given that meta-analytic methods assume independence. Some researchers recommend that meta-analysts simply choose one sample for inclusion (Lipsey & Wilson, 2001). However, in the interest of maximizing statistical power, we elected to include all available dependent samples but to test for their relative influence on the meta-analytic results post hoc. This was done by randomly deleting one dependent sample at a time and examining changes to the mean effect. Across meta-analytic comparisons, effect sizes were computed for 53 samples (for a description of samples, see Table 1).

Criteria for study inclusion

Studies were considered eligible if they measured attachment representation via the AAI in association with anxiety symptoms. Because strict adherence to the AAI protocol is critical for interviews to be scored properly and reliably, studies using a modified version of the AAI were excluded. We did, however, identify a handful of cases in which the final question of the AAI ("What would you hope your child might have learned from his/her experiences of being parented by you?") was modified for use with adolescent participants. We decided to include these data given that this slight adaption is unlikely to significantly affect one's attachment classification. Studies were also limited to those that assessed trait-anxiety (as opposed to state-anxiety). Trait-anxiety is thought to reflect stable individual differences that increase one's propensity to respond psychologically or physiologically to threatening situations, thus making it a more suitable outcome of interest.

In line with other meta-analyses on anxiety-related disorders (e.g., Bandelow et al., 2015; Otowa et al., 2016), we excluded studies ($k = 4$) that compared participants with clinically diagnosed mental health comorbidity with participants without any mental health disorders. This decision was made to exclude known confounders that may influence the link between attachment representations and anxiety symptoms (e.g., major depressive disorder in participants with anxiety-related disorders). Note that the vast majority of the studies assessed in this meta-analysis did not assess for mental health comorbid conditions; thus, it is likely that participants included in this meta-analysis had varying degrees of comorbid symptoms.

In terms of effect-size data, studies were included if they reported (a) mean differences in anxiety symptoms

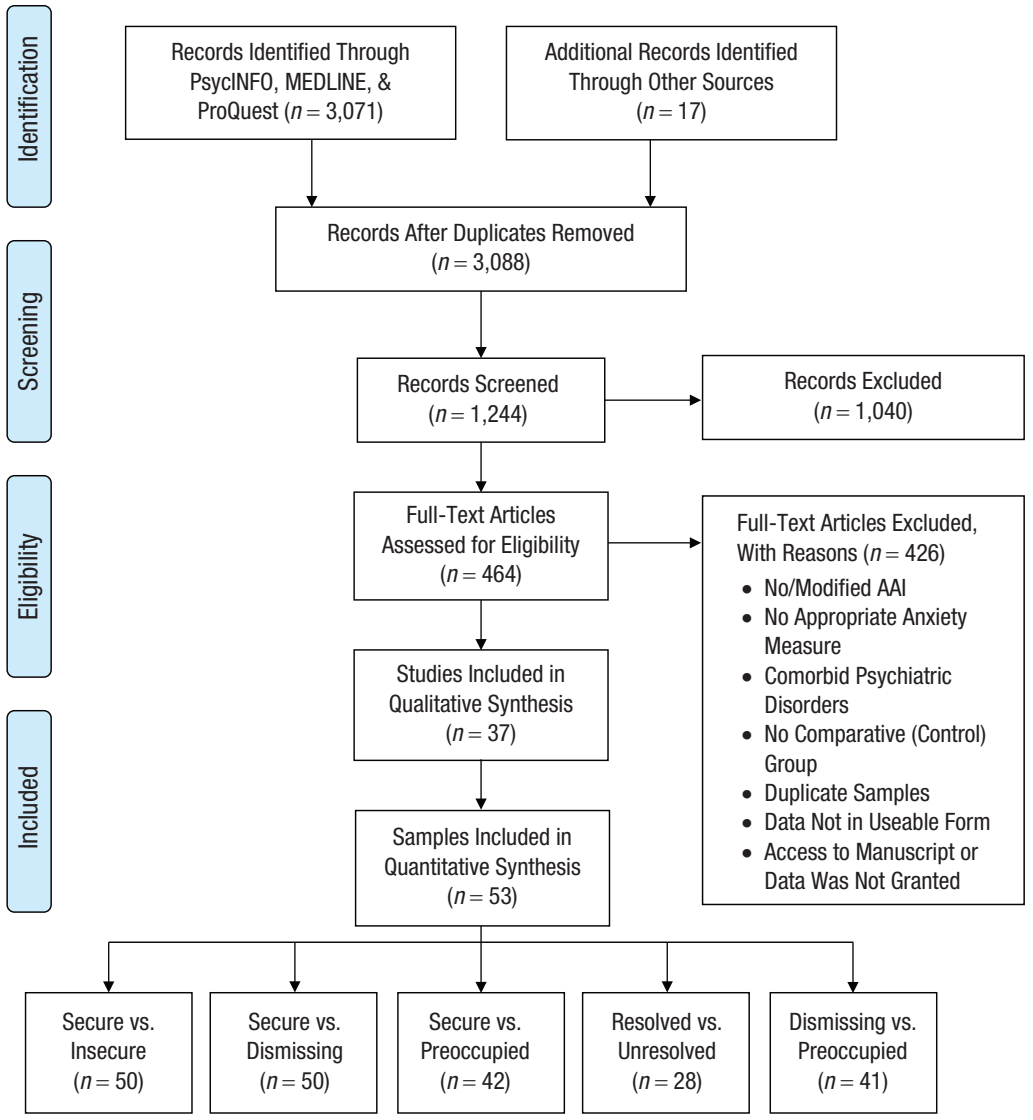

Fig. 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart for study selection.

between attachment classification groups, (b) frequency counts of clinically anxious versus nonanxious individuals across attachment classifications, or (c) the correlation between attachment classification (continuously measured via the AAI Q-Sort) and anxiety symptoms. For studies investigating an intervention of any kind, only preintervention baseline assessments or control-group data were coded. When studies reported effects on the same sample at multiple time points, the time point with the largest sample size was selected.

We faced two notable challenges when coding effect sizes from research reports. First, in many cases, authors reported on global symptom sum scores instead of anxiety subscale scores (e.g., the Symptom Checklist–90/–Revised was administered, but no anxiety subscale scores were reported). Second, for individuals with unresolved attachment, secondary classifications (e.g., unresolved/preoccupied vs. preoccupied; unresolved/dismissing vs. dismissing) were rarely reported. As a result, authors were asked to provide raw data so that effect sizes for all possible comparisons could be computed. In total, 61 authors were contacted. Of these, 37 could not be reached via the e-mail provided or returned data in a unusable form.

Coding of moderator variables

Several study/sample descriptors and methodological variables were coded as potential moderators. Study descriptors included (a) publication year, (b) country in which data were collected, and (c) whether the research report was a peer-reviewed article or dissertation.

Table 1. Description of Samples

Study	Country	Mean age	% Female	SES	Education	Anxiety measure	AAI code	Largest total *N*	Qualitative description
Ablow et al., 2013	U.S.	31.9	100	M/H	College	BSI	Main	67	Primiparous women in their third trimester of pregnancy
Adam et al., 2004	U.S.	34.0	100	M/H	College	IPAT	Main	100	Mothers of 2-year old children
Atkinson et al., 2009	Canada	31.2	100	M/H	College	SCL-90-R	Main	128	Mothers of young children recruited during the third trimester of pregnancy
Bakermans-Kranenburg et al., 2011	U.S.	38.3	53.0	M/H	College	BSI	Main	239	Adopted adults separated from their biological parents at birth and participating in the Iowa Adoption Study
Bakermans-Kranenburg et al., 2011	U.S.	38.4	53.0	M/H	College	BSI	Main	146	Nonbiological siblings of adopted adults separated from their biological parents at birth and participating in the Iowa Adoption Study
Balenzano et al., 2018	Italy	—	—	—	—	SCL-90-R	Main	21	Adopted young adults
Bernstein, 2016[a]	U.S.	27.0	100	L	College	TSC-40	Main	24	At-risk mothers participating in an ongoing longitudinal study in the Pacific Northwest
Blumberg, 1997[a]	U.S.	20.0	100	M/H	College	SCL-90	Main	50	College women of sophomore status or higher recruited through a university subject pool in the Midwest
Borelli et al., 2013	U.S.	20.0	48.2	—	College	BSI	Main	46	College undergraduates attending a university in the Northeast
Borelli et al., 2013	U.S.	19.2	0	M/H	College	BSI	Main	50	College undergraduate males attending a western U.S. university
Borelli et al., 2019	Italy	14.6	51	—	HS	PGWBI	Main	77	A community sample of high school students without any *DSM–IV* Axis I disorders
Busch et al., 2008	U.S.	—	100	M/H	—	BSI	Main	81	Mothers reporting at least one significant lifetime loss as part of a longitudinal study
Cary, 2000[a]	U.S.	42.0	100	M/H	College	BSI	Main	53	Divorced women of at least 2 years living in the western U.S.
Dagan et al., 2018	U.S.	21.2	86.5	M/H	College	BSI	Main	35	Undergraduate students attending an urban college in the Northeast
Dagan et al., 2018	U.S.	20.1	72.0	M/H	College	BSI	Main	49	Undergraduate students attending a suburban university in the Northeast
Dawson et al., 2014	U.S.	14.3	52.0	M/H	HS	BAI	Q-Sort	161	Socioeconomically and ethnically diverse adolescents participating in a longitudinal study of social development
Ehrlich et al., 2011	U.S.	16.5	62.4	M/H	HS	CBCL	Main	180	Adolescents recruited from local high schools in a large metropolitan area
Finger, 2006[a]	U.S.	26.82	100	M/H	College	MCMI-III	Main	63	Mothers of young children recruited from community clinics
Fortuna et al., 2011	U.S.	21.7	50.0	M/H	College	ASR	Q-Sort	60	Oldest sibling from a sample of biologically related siblings recruited from the Midwest

(continued)

Table 1. *(continued)*

Study	Country	Mean age	% Female	SES	Education	Anxiety measure	AAI code	Largest total *N*	Qualitative description
Fortuna et al., 2011	U.S.	19.2	50.0	M/H	College	ASR	Q-Sort	60	Youngest sibling from a sample of biologically related siblings recruited from the Midwest
Gralinski-Bakker et al., 2004	U.S.	25.8	50.0	M/H	College	SCL-90-R	Main	65	Living members of a longitudinal sample who had been initially recruited as high school students in 1978
Haydon et al., 2014	U.S.	17.8	51.7	M/H	HS	YSR	Main	807	Participants recruited as part of the Study of Early Child Care and Youth Development
Holland & Roisman, 2010	U.S.	20.71	0	M/H	College	ASR	Q-Sort	114	Exclusively dating males recruited from a small midwestern town
Holland & Roisman, 2010	U.S.	20.14	100	M/H	College	ASR	Q-Sort	114	Exclusively dating females recruited from a small midwest town
Hughes et al., 2004	U.K.	—	100	—	—	STAI	Main	60	Primigravid mothers serving as control subjects and assessed during the third trimester of pregnancy
Jones-Mason et al., 2016	U.S.	19.8	81.2	M/H	College	BAI	Main	119	College students attending a public university in the western U.S.
R. R. Kobak & Sceery, 1988	U.S.	18.2	50.9	M/H	College	HSCL-90	Q-Sort	53	Primarily middle-class first-year college students
R. Kobak et al., 2009	U.S.	15.0	51.0	L	HS	YSR	Q-Sort	198	Economically disadvantaged adolescents
Koren-Karie & Getzler-Yosef, 2019	Israel	42.9	100	M/H	College	BSI	Main	30	Comparison group mothers with no reported history of child abuse
Kuipers et al., 2016	The Netherlands	21.4	95.0	—	College	SCL-90	Main	20	Healthy control subjects recruited from a local university
Pace et al., 2015	Italy	51.5	100	M/H	College	SCL-90-R	Main	30	Adoptive mothers of late-adolescents from international adoption agencies
Pianta et al., 1996	U.S.	22.0	100	L	HS	MMPI-2	Main	110	High-risk first-time mothers recruited during their second trimester of pregnancy to serve as control subjects for a preventive intervention program
Piermattei et al., 2017	Italy	46.0	0	M/H	HS	SCL-90-R	Main	20	Adoptive fathers of late-adopted children
Piermattei et al., 2017	Italy	44.8	100	M/H	College	SCL-90-R	Main	18	Adoptive mothers of late-adopted children
Raby et al., 2017	U.S.	39.6	95.5	M/H	College	BSI	Main	130	Internationally adoptive parents
Raby et al., 2017	U.S.	26.3	98.5	L	HS	PDSQ	Main	189	Parents of young children living in poverty and involved with Child Protective Services
Raby et al., 2017	U.S.	42.4	94.2	M/H	College	BSI	Main	149	Foster parents of toddlers
Roisman et al., 2002	U.S.	26.0	49.7	L	College	YASR	Main	163	A subsample of the children of mothers who had participated in the Minnesota Longitudinal Study of Risk and Adaptation
Roisman et al., 2004	U.S.	21.5	53.3	M/H	College	YASR	Q-Sort	60	Young undergraduate and graduate students from a midwestern university

(continued)

Table 1. *(continued)*

Study	Country	Mean age	% Female	SES	Education	Anxiety measure	AAI code	Largest total *N*	Qualitative description
Roisman et al., 2008	U.S.	33.97	0	M/H	College	ASR	Q-Sort	30	Gay men within a committed relationship for at least a year (Group 1)
Roisman et al., 2008	U.S.	32.77	0	M/H	College	ASR	Q-Sort	30	Gay men within a committed relationship for at least a year (Group 2)
Roisman et al., 2008	U.S.	35.07	100	M/H	College	ASR	Q-Sort	30	Gay women within a committed relationship for at least a year (Group 1)
Roisman et al., 2008	U.S.	34.4	100	M/H	College	ASR	Q-Sort	30	Gay women within a committed relationship for at least a year (Group 2)
Roisman et al., 2008	U.S.	22.72	0	M/H	College	ASR/YASR	Q-Sort	50	Young, first-time-engaged men
Roisman et al., 2008	U.S.	22.24	100	M/H	College	ASR/YASR	Q-Sort	50	Young, first-time-engaged women
Roisman et al., 2008	U.S.	57.98	0	M/H	College	ASR/YASR	Q-Sort	40	Men who were married for at least 15 years
Roisman et al., 2008	U.S.	55.78	100	M/H	College	ASR/YASR	Q-Sort	40	Women who were married for at least 15 years
Roisman et al., 2006	U.S.	18.93	47.7	M/H	College	YASR	Main	132	Heterogenous group of undergraduate students
Scharf et al., 2011	Israel	17.5	100	M/H	HS	MHI	Main	110	Late-adolescent female seniors in high school soon to begin compulsory military service
Scharf et al., 2012	Israel	17.5	0	M/H	HS	MHI	Main	85	Late-adolescent male students with senior-high-school status participating in a longitudinal study
Scheidt et al., 2012	Germany	35.2	100	—	College	HADS	Q-Sort	31	Women recruited from a university hospital in Germany who had lost a child to miscarriage or perinatal death
Tarabulsy et al., 2012	Canada	28.4	65	M/H	College	SCL-90-R	Main	99	At-risk college students receiving academic advising services who were followed up a decade later
van Emmichoven et al., 2003	The Netherlands	36.7	67.9	—	—	ADIS-R	Main	84	Primarily female healthy control subjects recruited from the general population

Note: AAI = Adult Attachment Interview; ADIS-R = Anxiety Disorders Interview Schedule–Revised; ASR = Adult Self-Report (anxiety subscale); BAI = Beck Anxiety Inventory II; BSI = Brief Symptom Inventory (anxiety subscale); CBCL = Child Behavior Checklist/6-18 (anxiety subscale); *DSM–IV* = fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders*; HADS = Hospital Anxiety and Depression Scale (anxiety subscale); HS = high school; HSCL-90 = Hopkins Symptom Checklist–90; IPAT = Personality and Ability Testing (anxiety subscale); L = low; M/H = mid/high; MCMI-III = Millon Clinical Multiaxial Inventory III; MHI = Mental Health Inventory (anxiety subscale); MMPI-2 Minnesota Multiphasic Personality Inventory–2; PDSQ = Psychiatric Diagnostic Screening Questionnaire (anxiety subscale); PGWBI = Psychological General Well-Being Index (anxiety subscale); SCL-90/SCL-90-R = Symptom Checklist-90/Symptom Checklist-90-Revised (anxiety subscale); SES = socioeconomic status; TSC-40 = Trauma Symptom Checklist–40 (anxiety subscale); YASR = Young Adult Self Report/18-30 (anxiety subscale); YSR = Youth Self-Report/11-18 (anxiety subscale); Q-sort = AAI Q-sort (R. R. Kobak et al., 1993); Main = AAI classification system (Main & Goldwyn, 1998); U.K. = United Kingdom.

[a]These articles are dissertations.

Sample descriptors included (d) participants' mean age in years; (e) mean age dichotomized as "adult" (age ≥ 18 years) or "adolescent" (age < 18 years); (f) biological sex, coded as percentage of the sample that was female; (g) the percentage of the sample that were parents; (h) parent status dichotomously coded as "parent" (percentage parent ≥ 60%) or "nonparent" (percentage parent < 60%); (i) the percentage of the sample that was White; and (j) race dichotomously coded as "majority White" (> 60%) or "majority non-White" (≤ 60%).

We also coded several risk factors thought to contribute to anxiety symptoms or attachment classification. These included (a) SES, dichotomized as primarily low or primarily middle/high; (b) mean years of education; (c) mean level of education dichotomized as "some college or more" (> 50% of the sample) or "high school or less"; and (d) overall risk status on the basis of whether authors made explicit mention of risk factors.

Finally, we coded several methodological variables. These included (a) the type of AAI coding used (Main classification system or Attachment Q-Sort) and (b) the time interval between AAI and anxiety assessments coded as "concurrent" (≤ 1 month apart) or "nonconcurrent" (> 1 month apart). Notably, when data could be computed from multiple methods of attachment and anxiety, preference was given to the Main classification system and self-report measures, respectively.

Given the number of comparisons tested, the relatively low proportion of individuals classified as insecure subtypes, and the strong reliance on author-provided data, in most cases, moderator variables were coded on the basis of study-level descriptors. Thus, for some comparisons, coded moderator values are a close approximation and not exact descriptions of individuals included in a given meta-analysis (e.g., mean age for the full sample entered for comparisons with fewer data points, e.g., preoccupied vs. dismissing).

Coding was performed by O. Dagan and C. R. Facompré. After establishing initial reliability on a small subset of studies, both authors coded all studies independently. Studies used to establish initial reliability were returned to the end of the coding list to avoid remembering details of the study or consensus ratings. Interrater reliability for continuous moderator variables and those used to compute the effect-size statistic was conducted using the intraclass correlation coefficient (ICC; average measures, absolute agreement). Categorical moderator variable reliability was conducted using Cohen's κ. When a single study provided more than one effect size, redundant study and research design descriptors undergoing moderation testing were first deleted to reduce the likelihood of inflating the reliability statistic (e.g., year of publication). Reliability among continuously coded moderator and effect-size variables were high (ICC M = .97, range = .93–1.0 and ICC M = .99, range = .82–1.0, respectively). Reliability among categorically coded moderators was also high (κ M = .87, range = .74–1.0). All disagreements were resolved through consensus.

Data-analysis strategy and coding of effect sizes

Effect sizes were calculated using the *metafor* package (Version 2.1-0; Viechtbauer, 2010) for the R software environment (Version 3.5.3; R Core Team, 2019; Viechtbauer, 2010). Raw means and standard deviations of anxiety by attachment classification were computed as a standardized mean difference (Cohen's d). As is common in meta-analysis, studies also reported data in several other statistical forms. One study, for example, reported 2 × 2 frequency counts of anxious and nonanxious participants by their assigned attachment classification. Others applied a dimensional rating of attachment security and anxiety (e.g., AAI Q-Sort). In all cases, data were coded in their raw form (frequency counts, correlation coefficients) and transformed into the standardized mean difference before analysis so that they could be combined with studies reporting on the mean difference.

Data for meta-analysis were fit to a random-effects model using the restricted maximum-likelihood estimator (Borenstein, Hedges, Higgins, & Rothstein, 2011; Viechtbauer, 2005, 2010). Data were organized such that positive effect sizes represent increased anxiety symptoms with attachment insecurity. Because some meta-analytic comparisons either compared two types of insecure attachment directly (e.g., preoccupied vs. dismissing) or compared participants with unresolved versus nonunresolved attachment status (e.g., organized vs. unresolved, unresolved/dismissing vs. dismissing, unresolved/preoccupied vs. preoccupied), additional considerations were made with respect to effect-size direction. When applicable, positive effect sizes were set to indicate higher rates of anxiety among individuals with (a) unresolved status than individuals with organized status, (b) preoccupied attachment than individuals with dismissing attachment, and (c) unresolved/preoccupied attachment than individuals with unresolved/dismissing attachment.

Heterogeneity in the mean effect observed among moderator variables were explored using the Q-statistic. Following evaluation of heterogeneity, continuous and categorical moderators were conducted under a mixed-effects model with metaregression (when applicable). Note that moderator data were missing to various degrees—a ubiquitous challenge in meta-analysis. Analysis of moderator variables with fewer than four data points

at a given level were not conducted to avoid unstable moderation effects, which is consistent with previous studies in the field (e.g., Bakermans-Kranenburg, Van IJzendoorn, & Juffer, 2003). Following procedures described in Viechtbauer and Cheung (2010), we conducted and evaluated influential and outlying case diagnostics one at a time to estimate their relative impact on the meta-analytic results.

Publication bias

Publication bias for each meta-analytic comparison was evaluated using Duval and Tweedie's (2000a, 2000b) trim-and-fill procedure. The trim-and-fill procedure estimates funnel plot asymmetry and fills potentially "missing" data points on either side of the effect-size distribution. The *x*-axis of the graph represents the effect-size magnitude, whereas the *y*-axis reflects the precision of the effect. Studies missing toward the bottom-left side of the funnel plot are thought to indicate publication bias (i.e., the "file-drawer problem") given that small nonsignificant effects tend not to be published. In addition, to the graphical output, the trim-and-fill procedure provides a statistically adjusted mean effect size that can be compared with the mean effect from the observed data. Note that meta-analytic comparisons with fewer than 10 samples did not undergo publication bias analyses.

Results

Secure versus insecure attachment

The primary outcome in this meta-analysis was the standardized mean-difference (*d*) in anxiety symptoms between individuals with secure and insecure attachment representations. Participants comprising the secure group included those classified as secure regardless of whether they carried a primary unresolved classification. In total, 50 samples and 4,682 participants contributed to this meta-analysis; effect sizes ranged from −1.30 to 1.24 (see Fig. S1 in the Supplemental Material available online). The overall random effects estimate was $d = 0.07$ (95% CI = [−0.02, 0.15]). Results suggested that, on average, individuals classified as secure and insecure do not significantly differ in their anxiety symptoms. In addition to the confidence interval, which provides an estimate of statistical precision around the mean effect, Higgins's 95% prediction interval (PI) estimates the range of true effects that might be expected among similar studies in the future. The PI holds important clinical utility given that it provides a nuanced understanding of the variability of effects across different settings (for further discussion, see IntHout, Ioannidis, Rovers, & Goeman, 2016). In the current meta-analysis, Higgins's 95% PI ranged from −0.26 to 0.39, which suggests that the effects for some populations under certain conditions could fall on either side of 0. The removal of potential outliers or influential cases did not significantly affect the meta-analytic result.

The proportion of variance observed among effect sizes was moderate ($I^2 = 29.17\%$, $\tau^2 = .02$), which indicates heterogeneity among true effects, $Q(49) = 80.72$, $p = .003$. Thus, study- and sample-level moderators were explored (see Table 2). Before analysis, continuous moderators were first centered around the mean to allow for interpretation of the intercept. Among the variables tested, only publication year significantly accounted for heterogeneity among true effects. On average, effect sizes became significantly smaller over time ($\beta_1 = -0.02$, $p = .01$). The test for residual heterogeneity was significant, however, which suggests that moderators not included in the model might account for additional unexplained variance in the mean effect ($Q_E = 72.61$, $df = 48$, $p = .01$).

Secure versus dismissing attachment

We tested the standardized mean-difference (*d*) in anxiety symptoms between individuals classified as secure and dismissing. Participants comprising the secure group included those described above. The dismissing group included individuals classified as dismissing regardless of whether they carried a primary unresolved classification. Overall, effect sizes from 50 samples and 4,376 participants were extracted, ranging from −1.32 to 0.94 (Fig. 2a). The overall random effects estimate was $d = -0.02$ (95% CI = [−0.10, 0.05]; 95% PI = [−0.27, 0.22]). Results suggested that individuals classified as securely attached did not significantly differ in anxiety symptoms from those classified as dismissing. Several studies were identified as potential outliers or influential cases, and the removal of these studies did not significantly affect the meta-analytic result.

The proportion of variability observed among effect sizes was low ($I^2 = 19.69\%$, $\tau^2 = .01$), but heterogeneity was detected among true effects ($Q = 68.09$, $df = 49$, $p = .04$). Thus, study- and sample-level moderators were explored (see Table 2).

We found that SES and race significantly explained heterogeneity among true effects. First, low- and mid/high-SES samples produced mean effects of $d = -0.23$ ($p = .01$) and $d = 0.00$ ($p = .98$), respectively. When the samples were directly compared, the omnibus test of the SES factor yielded a significant result ($Q_M = 5.89$, $df = 1$, $p = .02$), and the test for residual heterogeneity was nonsignificant ($Q_E = 73.44$, $df = 36$, $p < .001$). In addition, a small but significant increase in the effect size was found for every 1-unit increase in race, coded as percentage White ($\beta_1 = 0.003$, $p = .03$). Moreover, a

Table 2. Categorical and Continuous Moderators for the Associations Between Attachment and Anxiety Symptoms

		Secure versus Insecure				Secure versus Dismissing				Secure versus Preoccupied				Preoccupied versus Dismissing				Resolved versus Unresolved			
Moderators		*k*	β	*Q* (*df*)	*p*	*k*	β	*Q* (*df*)	*p*	*k*	β	*Q* (*df*)	*p*	*k*	β	*q* (*df*)	*p*	*k*	β	*Q* (*df*)	*p*
Publication type				0.36 (1)	.55			—	—			—	—			—	—			—	—
Peer review	β_0	46	0.06																		
Dissertation	β_1	4	0.11																		
Country				0.00 (1)	> .99			0.44 (1)	.51			0.15 (1)	.70			2.30 (1)	.13			0.56 (1)	.46
Other	β_0	13	0.07			12	0.03			8	0.27			7	0.03			6	0.41		
United States	β_1	37	−0.0002			38	−0.07			35	0.09			34	0.33			21	−0.14		
Socioeconomic status				0.72 (1)	.40			5.89 (1)	.02			0.60 (1)	.44			5.07 (1)	.02			0.65 (1)	.42
Low	β_0	4	−0.03			5	−0.23			5	0.48			5	0.76			4	0.33		
Mid/high	β_1	39	0.09			39	0.23			34	−0.18			33	−0.51			19	−0.12		
Education				1.47 (1)	.23			0.10 (1)	.75			0.14 (1)	.70			0.09 (1)	.76			0.33 (1)	.56
Some college or more	β_0	38	0.09			37	−0.05			31	0.37			31	0.34			20	0.31		
High school or less	β_1	9	−0.10			10	0.03			9	−0.07			8	−0.06			4	−0.08		
Race				3.38 (1)	.07			4.24	.04			0.64 (1)	.42			4.32 (1)	.04			0.19 (1)	.67
< 60% White	β_0	9	−0.05			10	−0.14			10	0.44			9	0.63			7	0.25		
> 60% White	β_1	36	0.15			37	0.16			30	−0.14			29	−0.41			19	0.07		
Risk status				0.15 (1)	.70			1.39 (1)	.24			1.38 (1)	.24			7.41 (1)	.007			0.66 (1)	.42
Nonrisk	β_0	43	0.07			43	−0.002			36	0.31			35	0.22			22	0.26		
Risk	β_1	7	−0.04			7	−0.12			7	0.25			6	0.51			5	0.12		
Parent versus nonparent				0.14 (1)	.71			1.62	.20			0.97 (1)	.33			2.08 (1)	.15			0.02 (1)	.89
Majority nonparents	β_0	13	0.05			13	−0.02			13	0.19			13	0.15			5	0.32		
Majority parents	β_1	15	−0.04			15	−0.15			11	0.18			11	0.35			12	0.03		
Adolescent vs. adult				0.14 (1)	.71			1.05 (1)	.31			0.35 (1)	.55			0.72 (1)	.40			—	—
< 18	β_0	6	0.03			7	0.04			7	0.25			6	0.15						
≥ 18	β_1	44	0.04			43	−0.09			36	0.12			35	0.19						
Concurrent assessment				0.28 (1)	.60			1.14 (1)	.29			2.07 (1)	.15			4.81 (1)	.03			—	—
Concurrent	β_0	17	0.03			17	−0.14			15	0.44			14	0.62						
Nonconcurrent	β_1	7	−0.05			7	0.12			7	−0.32			7	−0.58						
Adult Attachment Interview coding system				0.33 (1)	.57			1.26 (1)	.26			0.10 (1)	.76			2.47 (1)	.12			—	—
Main	β_0	34	0.05			43	−0.06			27	0.37			26	0.41						
Q-sort	β_1	16	0.05			7	0.10			16	−0.05			15	−0.25						
Publication year	β_1	50	−0.02	7.71 (1)	.01	50	−0.01	2.88 (1)	.09	43	−0.02	2.72 (1)	.10	41	−0.01	0.31 (1)	.58	27	0.01	1.53 (1)	.22
Mean age	β_1	48	0.004	1.12 (1)	.29	49	−0.002	0.15 (1)	.70	42	0.01	0.53 (1)	.47	41	0.005	0.32 (1)	.57	25	0.01	1.50 (1)	.22
Mean education	β_1	15	0.04	1.89 (1)	.17	14	−0.01	0.29 (1)	.59	13	0.03	0.26 (1)	.61	12	0.09	1.40 (1)	.24	9	0.04	0.67 (1)	.41
Percentage female	β_1	49	0.002	1.66 (1)	.20	49	0.00	0.09 (1)	.76	42	0.002	0.68 (1)	.41	41	0.001	0.25 (1)	.62	27	0.004	2.06 (1)	.15
Percentage parent	β_1	28	−0.0002	0.04 (1)	.84	27	−0.002	2.15 (1)	.14	24	0.003	2.50 (1)	.11	24	0.005	3.51 (1)	.06	17	0.00	0.01 (1)	.94
Percentage White	β_1	38	0.003	3.38 (1)	.07	39	0.003	4.92 (1)	.03	35	−0.002	0.59 (1)	.44	34	−0.01	3.51 (1)	.06	23	−0.001	0.35 (1)	.55

significant difference in race was observed when coded categorically. The average effect size for samples featuring majority non-White samples was $d = -0.14$ ($p = .04$), whereas the mean effect for samples featuring majority White samples was $d = 0.2$ ($p = .57$). When the samples were directly compared, the omnibus test of the dichotomous race factor yielded a significant result ($Q_M = 4.24$, $df = 1$, $p = .04$). Finally, in both continuously and categorically coded race analyses, the test for residual heterogeneity was nonsignificant ($Q_E = 27.07$, $df = 37$, $p = .88$ and $Q_E = 55.23$, $df = 45$, $p = .14$, respectively).

Secure versus preoccupied attachment

Next, we tested the standardized mean-difference (d) in anxiety symptoms between individuals with secure and preoccupied attachment representations. The preoccupied group included participants with and without

a

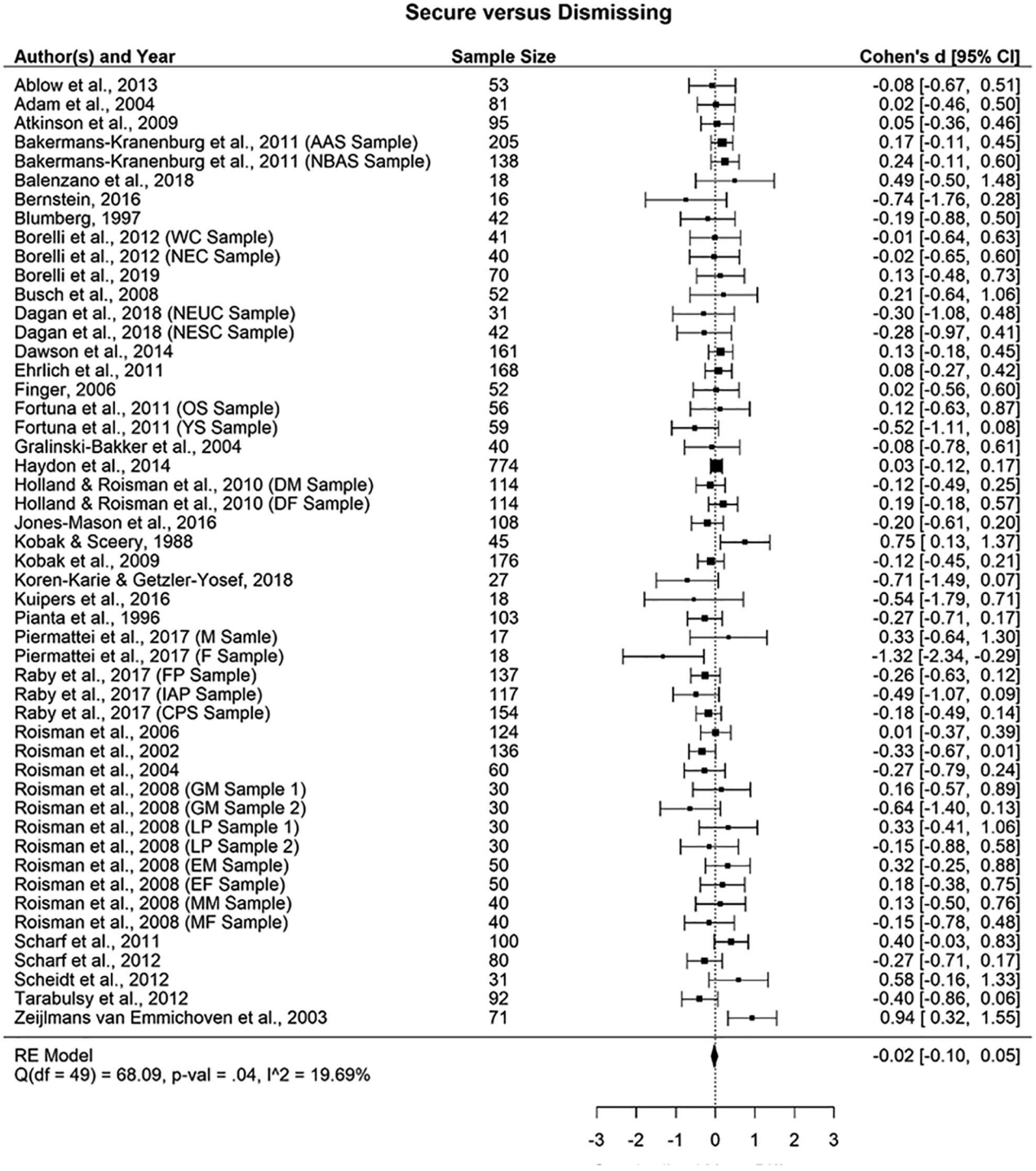

Fig. 2. *(continued on next page)*

b

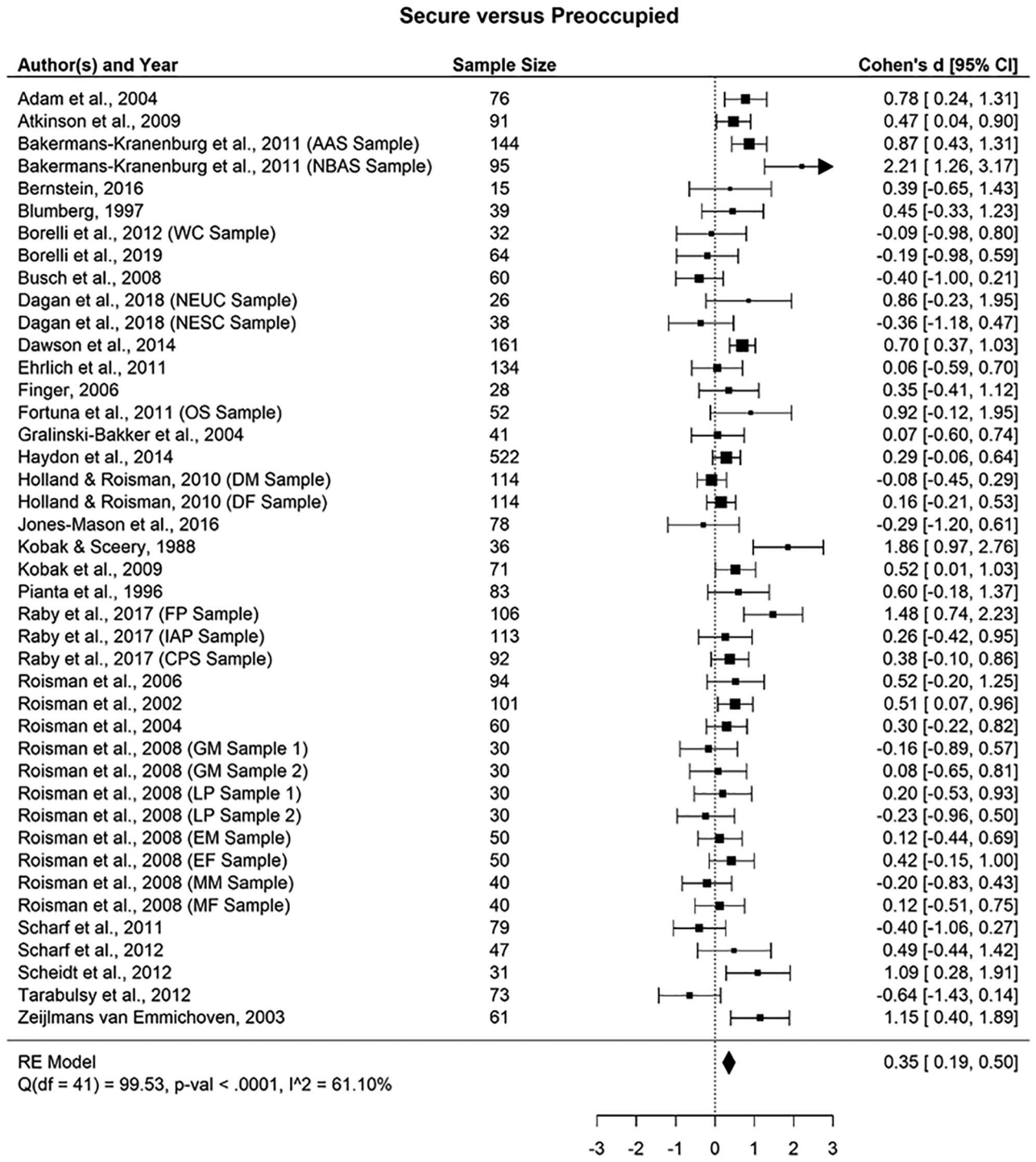

Fig. 2. Effect-size estimates for the secure versus dismissing (a) and secure versus preoccupied (b) comparisons computed as the standardized mean-difference (Cohen's *d*). AAS = adopted adult siblings, NBAS = nonbiologically related adult siblings, WC = western college students, NEUC = northeastern urban college students, NESC = northeastern suburban college students, OS = oldest sibling, DM = dating males, DF = dating females, FP = foster parents, IAP = internationally adoptive parents, CPS = child protective services, GM = gay male partner, LP = lesbian partner, EM = engaged males, EF = engaged females, MM = married males, MF = married females.

a primary unresolved classification. Altogether, this meta-analysis included 42 samples and 3,271 participants; effect sizes ranged from −0.64 to 2.21 (Fig. 2b). The overall random effects estimate was $d = 0.35$ (95% CI = [0.19, 0.50]; 95% PI = [−0.44, 1.14]), which suggests that individuals classified as preoccupied reported significantly higher anxiety symptoms than those classified as secure. The removal of these studies identified as potential outliers did not significantly affect the meta-analytic result.

The proportion of variability observed among effect sizes was moderate to high ($I^2 = 61.10\%$, $\tau^2 = .15$), indicating heterogeneity among true effects, $Q(41) = 99.53$, $p < .0001$. However, we found no significant moderator effects (see Table 2).

Preoccupied versus dismissing attachment

We also investigated the standardized mean-difference (d) in anxiety symptoms between individuals with preoccupied and dismissing attachment representations. Preoccupied and dismissing groups were created following the same procedures described above. In total, 41 samples and 2,184 participants contributed to this meta-analysis, with effect sizes ranging from −0.89 to 2.01 (see Fig. S2 in the Supplemental Material). The overall random effects estimate was $d = 0.31$ (95% CI = [0.15, 0.47]; 95% PI = [−0.47, 1.08), which suggests that individuals classified as preoccupied reported significantly higher anxiety symptoms than individuals classified as dismissing. Although some studies were identified as potential outliers or influential cases, removing them did not significantly affect the magnitude of the obtained effect size.

The proportion of variability observed among effect sizes was moderate ($I^2 = 56.55\%$, $\tau^2 = .14$), indicating heterogeneity among true effects, $Q(40) = 88.99$, $p < .001$, which was explained by several moderators (see Table 2). First, the average effect for samples featuring majority non-White participants and majority White participants was significant ($d = 0.63$, $p < .001$ and $d = 0.23$, $p = .01$, respectively). Groups differed from one another, such that the mean effect for majority White samples was .41 lower than majority White samples ($Q_M = 4.32$, $df = 1$, $p = .04$). Note that the test for residual heterogeneity was significant ($Q_E = 74.61$, $df = 36$, $p < .001$), which suggests that moderators not included in the model could account for additional unexplained variance in the mean effect.

Second, we found that the average effect for nonrisk and high-risk samples was also significant ($d = 0.22$, $p = .01$ and $d = 0.73$, $p < .001$, respectively). When the two samples were directly compared, the omnibus test of the risk factor was significant ($Q_M = 7.41$, $df = 1$, $p = .01$); high-risk samples showed a larger effect size than nonrisk samples. Note that moderators not included in the model might have accounted for additional unexplained variance in the mean effect ($Q_E = 71.62$, $df = 39$, $p = .001$).

Third, average effect sizes for low-SES and mid/high-SES samples were significant ($d = 0.76$, $p < .001$ and $d = 0.25$, $p = .004$, respectively). When the two samples were directly compared, the omnibus test of the SES factor yielded a significant result ($Q_M = 5.07$, $df = 1$, $p = .02$); low-SES samples had larger effect sizes than mid/high-SES samples. Note that the test for residual heterogeneity was also significant ($Q_E = 73.44$, $df = 36$, $p < .001$).

Finally, although studies for which the AAI and anxiety measures were administered concurrently showed a significant effect size ($d = 0.62$, $p < .001$), the mean effect size of samples for which core assessments were administered nonconcurrently (> 1 month apart) was not significantly different from 0 ($d = 0.04$, $p = .84$). When the measures were directly compared, the omnibus test of the assessment factor yielded a significant result ($Q_M = 4.81$, $df = 1$, $p = .03$). The test for residual heterogeneity was also significant ($Q_E = 38.00$, $df = 19$, $p = .01$).

Organized versus unresolved attachment

The primary outcome in this meta-analysis was the standardized mean-difference (d) in anxiety symptoms between organized (i.e., resolved) and unresolved individuals. Participants comprising the unresolved group included all individuals carrying a primary unresolved classification regardless of their secondary (secure/insecure) classification. Thus, individuals classified as unresolved/secure were included in the unresolved group. In total, 28 samples and 3,316 participants contributed to this meta-analysis; effect sizes ranged from −0.33 to 2.60 (see Fig. S3 in the Supplemental Material). The overall random effects estimate was $d = 0.29$ (95% CI = [0.16, 0.42]; 95% PI = [−0.11, 0.69]). Results suggested that on average, individuals classified as unresolved reported significantly higher anxiety symptoms than organized individuals. The removal of potential outliers or influential cases did not significantly affect the meta-analytic result.

The proportion of variability observed among effect sizes was moderate ($I^2 = 31.38\%$, $T^2 = .03$), indicating heterogeneity among true effects, $Q(27) = 46.29$, $p = .01$. No significant moderator effects were found (see Table 2).

Further exploratory meta-analyses

To explore the extent to which insecure-attachment subtypes drive differences in anxiety symptoms among unresolved-attachment classifications, we conducted a series of post hoc comparisons. These included (a) unresolved/dismissing versus dismissing, (b) unresolved/preoccupied versus preoccupied, and (c) unresolved/preoccupied versus unresolved/dismissing. Given the relatively low number of samples included in these narrower meta-analytic comparisons, these results should be interpreted with caution. Because of a limited variability in coded moderator variables, we took a conservative approach and did not explore moderation.

Unresolved/dismissing versus dismissing. The standardized mean-difference (*d*) in anxiety symptoms between dismissing participants with and without a primary unresolved classification was obtained. Five samples and 554 participants contributed to this meta-analysis; effect sizes ranged from −0.32 to 0.25. The overall random effects estimate was $d = 0.06$ (95% CI = [−0.21, 0.33]; 95% PI = [−0.38, 0.50]). The results suggested that individuals who were classified as unresolved/dismissing reported similar levels of anxiety as dismissing individuals. The proportion of heterogeneity among effect sizes was nonsignificant ($Q = 1.99$, $df = 4$, $p = .74$).

Unresolved/preoccupied versus preoccupied. Anxiety symptoms between preoccupied participants with and without a primary unresolved classification were compared. In total, five samples and 140 participants contributed to this meta-analysis; effect sizes ranged from −0.12 to 0.52. The overall random effects estimate was $d = 0.13$ (95% CI = [−0.24, 0.49]; 95% PI = [−0.46, 0.72]). Results suggested that individuals classified as unresolved/preoccupied and individuals classified as preoccupied did not significantly differ in their anxiety symptoms. The test of heterogeneity was nonsignificant ($Q = 1.31$, $df = 4$, $p = .86$).

Unresolved/preoccupied versus unresolved/dismissing. In this meta-analysis, the standardized mean-difference in anxiety symptoms between unresolved/preoccupied and unresolved/dismissing participants was computed from six samples and 142 participants. Effect sizes ranged from 0.32 to 0.73, producing an overall mean effect of $d = 0.55$ (95% CI = [0.20, 0.89]; 95% PI = [0.06, 1.03]). Results suggested that unresolved/preoccupied individuals reported significantly higher anxiety symptoms than individuals classified as unresolved/dismissing. The test of heterogeneity was nonsignificant ($Q = 0.69$, $df = 5$, $p = .98$).

Publication bias

Among the five primary meta-analytic comparisons tested for publication bias, the trim-and-fill procedure identified funnel plot asymmetry for two of them. Two potentially missing studies on the right side of Figure 3 (positive effect sizes) were identified for the secure-versus-dismissing comparison, whereas five potentially missing studies on the left side of Figure 3 (negative effect sizes) were identified for the organized versus unresolved comparison. The adjusted mean effect sizes for both comparisons were $d = -0.01$, $p = .73$ (observed sample $d = -0.02$, $p = .53$) and $d = 0.21$, $p = .009$ (observed sample $d = 0.29$, $p < .001$), respectively. Thus, publication bias did not appear to significantly affect the meta-analytic results.

Discussion

We aimed to quantify the association between adolescent and adult attachment representations coded from the AAI and anxiety symptoms. Individuals classified as insecure in their attachment representation were no more likely to experience anxiety symptoms than secure individuals. When insecure subclassifications were tested independently, however, preoccupied, but not dismissing individuals, reported significantly more anxiety than secure individuals. Preoccupied individuals were also significantly more anxiety prone than individuals who were classified as dismissing. We also found that unresolved individuals were more likely to report anxiety than individuals with an organized attachment classification. Finally, exploratory analyses revealed that unresolved/preoccupied individuals exhibited significantly more anxiety symptoms than unresolved individuals with a secondary classification of dismissing.

This pattern of results is largely consistent with recent meta-analytic work on the association between attachment representations and depression (Dagan, Facompré, & Bernard, 2018). With the exception of the overall secure/insecure meta-analysis (which produced a significant positive effect of $d = .21$, indicating higher rates of depression among insecure individuals), parallel anxiety and depression analyses produced mean effects of similar significance and magnitude. When reviewed in tandem, these studies provide a greater understanding of the particular kinds of attachment representations that predispose individuals to internalizing symptoms.

Secure versus insecure attachment

Contrary to our prediction, securely and insecurely attached individuals did not significantly differ in their

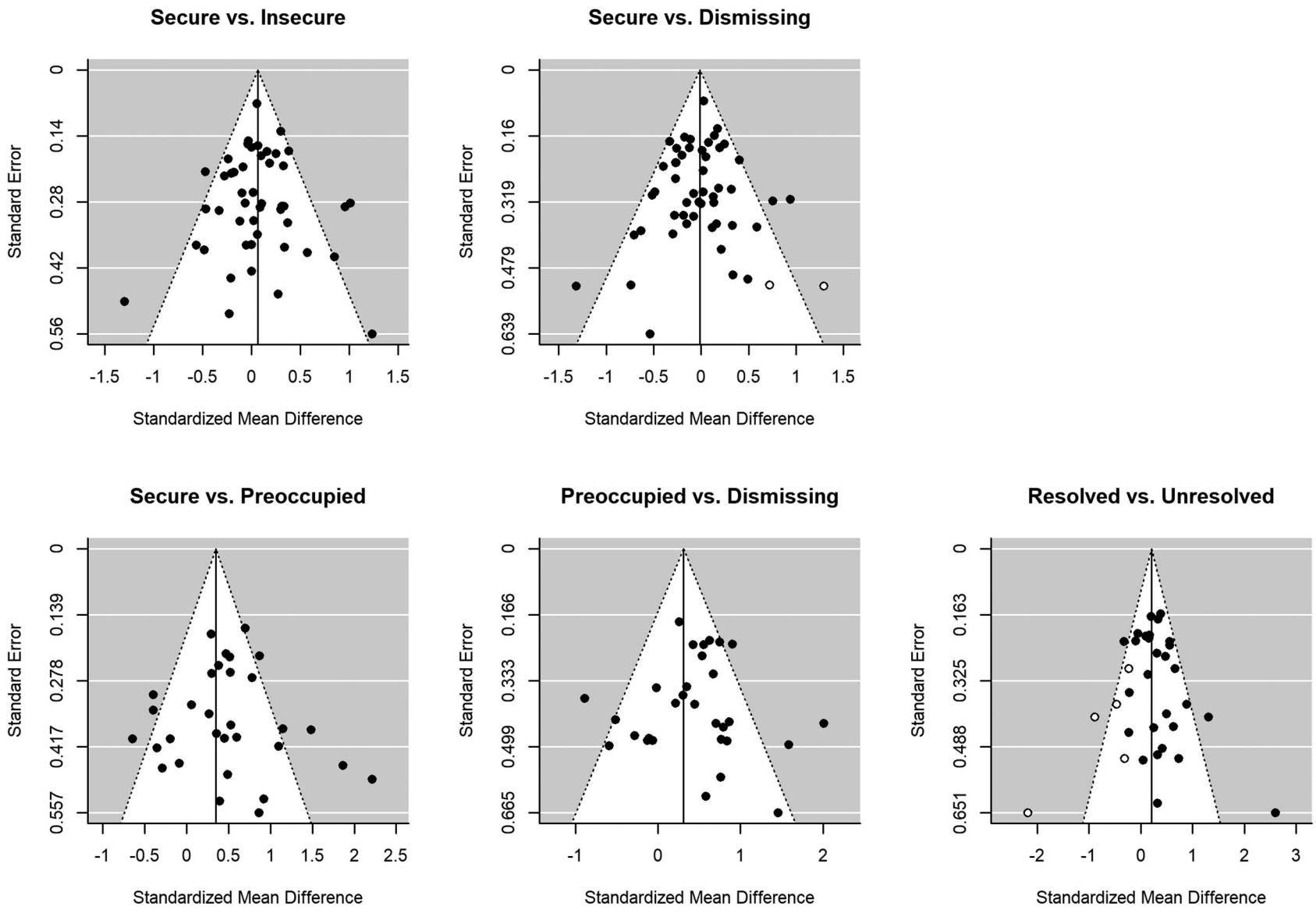

Fig. 3. Funnel plots represent effect-size point estimates by their standard error. Filled black circles represent observed effect-size estimates included in the meta-analyses; open white circles represent potentially missing studies imputed to correct for funnel plot asymmetry. Note that imputed studies in the bottom left corner of the graph may indicate publication bias (but see statistical output for adjusted mean effect).

anxiety symptoms. However, comparing the two insecure attachment subtypes to the secure attachment group revealed that preoccupied individuals, but not dismissing individuals, reported experiencing more anxiety symptoms than their secure counterparts. The current results suggest that insecure-attachment subtypes are associated with different levels of risk for experiencing internalizing symptoms.

Securely attached individuals draw from past experiences with sensitive and responsive caregivers and are more confident in their ability to solicit support from close others than insecurely attached individuals (Seiffge-Krenke & Beyers, 2005). It follows, then, that securely attached individuals may be less likely to experience prolonged distress about their safety in response to threatening stimuli than is often experienced by anxious individuals (Cassidy, 1995).

Compared with secure individuals, dismissing individuals are thought to experience elevated anxiety but to underreport these symptoms as a strategy to avoid them (Fortuna & Roisman, 2008; R. R. Kobak & Sceery, 1988; Pianta et al., 1996). Thus, dismissing individuals may only *appear* similar to securely attached individuals in the extent to which they report anxiety symptoms. Alternatively, dismissing individuals may actually experience low levels of distress given that they are well accustomed to avoiding processing emotional stimuli altogether. Thus, it may also be that the observed similarity in anxiety symptoms experienced by dismissing and secure individuals may actually exist because of similar tendencies to perceive threats as less overwhelming than others.

We found several moderators of the association between insecure-attachment subtypes and anxiety symptoms. Specifically, samples with a smaller percentage of White participants and predominantly low-SES participants had, on average, significantly larger effect sizes than samples with larger percentages of White participants and predominantly mid/high-SES participants. Given that they expect that signaling their needs for support will result in the resolution of the distress, secure individuals are flexible and open to reporting distress when experienced (R. Kobak, Zajac, Herres, & Krauthamer Ewing, 2015). The broader literature provides evidence that individuals who identify as ethnic minorities and individuals with low SES may experience more anxiety in general than their counterparts (Zvolensky, Garey, & Bakhshaie, 2017); thus, securely attached individuals within these groups (i.e., minority, low SES) may be more inclined to report anxiety symptoms compared with dismissing individuals, who tend to suppress expression of distress (Dagan, Facompré, & Bernard, 2018; Roisman, 2006). When distress is low, as is potentially the case in mid/high-SES and majority White samples, less anxiety is likely to be experienced by secure individuals, whereas dismissing individuals may still suppress its display even when experienced. Thus, secure and dismissing individuals in low-risk samples may not differ significantly in their reported anxiety symptoms.

Of note, we found that the association between attachment classifications and anxiety symptoms decreased in magnitude over time such that more recently published studies have smaller effect sizes than older studies. This phenomenon, also referred to as the "decline effect" (Ioannidis, 2005; Schooler, 2011), has been noted in other meta-analyses in the broader social sciences field (e.g., Molendijk et al., 2012) and the attachment field (Verhage et al., 2016). However, these results should be interpreted cautiously. For studies that reported on overlapping samples, we chose to use those that reported on larger samples or were published more recently over those that reported on smaller samples and were published earlier. Thus, the year coded for moderation analyses may not have consistently represented the year in which data were collected.

Dismissing versus preoccupied attachment

Preoccupied individuals endorsed significantly more anxiety symptoms when directly compared with dismissing individuals. Previous research has suggested that preoccupied and dismissing individuals may show differences in information-processing biases toward threat. For example, some have observed heightened physiological arousal among dismissing participants in response to AAI questions that provoke negative memories of caregivers (Dozier & Kobak, 1992; Roisman, 2007; Roisman, Tsai, & Chiang, 2004). This psychophysiological reactivity pattern may imply an initial, enhanced vigilance to and processing of the anxiety-provoking stimuli (Hoehn-Saric & McLeod, 2000; Hyde, Ryan, & Waters, 2019). In addition, dismissing individuals often generate vague, idealizing statements to describe past experiences with primary caregivers. Their lack of recall for details around specific event memories may reflect an avoidance strategy that serves to minimize distress and suppress anxiety associated with threatening stimuli (Cassidy & Kobak, 1988; Dozier & Kobak, 1992; Hesse, 2016).

In contrast, preoccupied individuals readily engage with difficult attachment memories, often to excess. Indeed, they often appear irritable and preoccupied with a variety of perceived injustices perpetrated by primary caregivers (Hesse, 2016). This pattern of conversational discourse in the AAI is thought to reflect attentional fixation on negative attachment-related memories (Main, Kaplan, & Cassidy, 1985). Similar to generally anxious adults who are engaged in prolonged

attention to the source of threat (e.g., Fox, Russo, & Dutton, 2002; Yiend & Mathews, 2001), preoccupied individuals may attempt to alleviate anxiety via regaining a sense of control of threatening stimuli, thus making it more predictable and less distressing (Grupe & Nitschke, 2013; Mineka & Hendersen, 1985). Paradoxically, this strategy tends to prolong anxiety symptoms because of sustained conscious awareness of threat (Mogg & Bradley, 2016). Thus, preoccupied individuals may be more vulnerable than dismissing adolescents and adults to experiencing prolonged and more severe anxiety symptoms.

Similar to the variables that moderated the link between secure versus dismissing attachment and anxiety, we found several factors that moderated the association between insecure-attachment subtypes and anxiety symptoms. Specifically, majority-non-White, predominantly low-SES, and author-identified high-risk samples evidenced significantly larger effect sizes than majority-White, mid/high-SES, and low-risk samples. These findings may suggest that other chronic stressors—such as being a minority or low-SES group member (Zvolensky et al., 2017)—exacerbate the effect of preoccupied (versus dismissing) attachment on anxiety symptoms. Cumulatively, risk factors pose additional stressors that high-risk preoccupied individuals may face compared with their low-risk counterparts and thus increase their experience of anxiety. Dismissing individuals' deactivating strategy, however, may be equally effective in avoiding anxiety even when operating in a high-risk environment, contributing to the larger observed difference in anxiety symptoms among the insecure-attachment subtype groups in studies of high-risk samples.

We also found that the time between assessments of attachment representations and anxiety symptoms moderated the link between insecure-attachment subtypes and anxiety symptoms. Specifically, the average effect size of studies for which the time between AAI administration and anxiety assessment was greater than 1 month was near 0 (d = 0.04), whereas the effect size for studies with attachment and anxiety assessments administered concurrently (< 1 month apart) was moderate to large (d = 0.62). Given the high variability in the length of time between assessments among studies categorized as "nonconcurrent" in this moderator analyses (between 1 month and 10 years), it may be the case that anxiety symptoms or attachment classifications changed from one assessment time point to the next, leading to null results within this category.

Organized versus unresolved attachment

Our findings indicated that individuals classified as unresolved tended to report more anxiety symptoms than individuals classified as any of the organized attachment patterns (i.e., individuals who are not classified with a primary unresolved status). Heightened anxiety symptoms in individuals who were classified as unresolved with respect to loss or abuse is consistent with trauma research, which indicates that individuals who were exposed to childhood trauma tend to experience more anxiety symptoms (Marusak, Martin, Etkin, & Thomason, 2015; Shalev, Liberzon, & Marmar, 2017).

Our exploratory analyses revealed that unresolved/preoccupied individuals endorsed significantly more anxiety symptoms than unresolved/dismissing individuals. This result suggests that unresolved status as coded via the AAI may not significantly affect anxiety symptoms over and above insecure-attachment patterns. These results are in line with evidence suggesting that preoccupied and unresolved-attachment representations load on a common factor (Haltigan et al., 2014; Roisman & Cicchetti, 2017). It may thus be the case that the two attachment classifications are too strongly correlated to produce differential correlates because they may not be psychologically distinct phenomena.

Clinical Implications

The current findings suggest that attachment patterns are important in understanding the interpersonal aspects of anxiety symptoms. Given that attachment patterns may be conceptualized as a lens through which one processes interpersonal information and likely influence affect regulatory capacities during times of distress (Bowlby, 1988; Daniel, 2006), targeting attachment representations through clinical intervention may prove useful in alleviating symptoms of anxiety. By increasing clinicians' sensitivity to the centrality of attachment representations to psychopathological symptoms, including anxiety, treatment effectiveness may be enhanced (Slade, 1999).

Attachment representations are thought to reflect past repeated interactions with attachment figures (Haydon, Collins, Salvatore, Simpson, & Roisman, 2012; Roisman et al., 2017; Steele et al., 2014). As attachment-relevant experiences become consolidated, relational schemas begin to shape beliefs about whether bids for support are likely to be recognized and needs effectively met (Bretherton & Munholland, 2008; Waters & Roisman, 2019). Accordingly, cognitive restructuring of client expectations regarding soliciting support when anxious may be an effective strategy for reducing anxiety symptoms among preoccupied and unresolved individuals. Moreover, an attachment-based clinical approach entails using the therapeutic alliance formed between clients and therapists as a safe interpersonal context from which clients can explore their ability to effectively communicate their distress with and be effectively soothed by the therapist. Becoming aware of this and

targeting less-than-optimal relational patterns through repeated interactions with the therapist may prove clinically useful when attempting to solicit effective support from others when experiencing anxiety (Holmes & Slade, 2018).

In addition to addressing the relational schemas in individual psychotherapy, prevention efforts can target attachment representations before adolescence. To this end, attachment-based interventions in infancy and childhood have shown promising results in reducing disorganized- and insecure-attachment patterns (for a review of studies, see Bakermans-Kranenburg et al., 2003; Facompré, Bernard, & Waters, 2018). Although studies of attachment-based interventions have yet to provide longitudinal evidence for effectively preventing or decreasing anxiety symptoms, increases in attachment security may aid in such efforts.

Limitations and Future Research

Several limitations should be considered when interpreting our results. First, one cannot infer causality when interpreting the links between attachment patterns and anxiety symptoms delineated here. Experimental clinical trials that modify attachment-related constructs may offer evidence of causal associations between attachment patterns and anxiety symptoms.

Second, given that most studies in the current meta-analysis recruited nonclinical samples, the overall effect sizes reported here may not reflect the magnitude of the association between attachment representations and clinically diagnosed anxiety disorders. Instead, one may conceive attachment representations as aspects of early developed adaptation, or maladaptation, to one's interpersonal environment (e.g., primary caregivers), which may increase or decrease vulnerability to experiencing anxiety symptoms later in life. Furthermore, research is needed to examine contextual and individual moderators that were not possible to test in the current investigation and that may interact with attachment representations to better predict anxiety in adolescent and adulthood. For example, exposure to child maltreatment and other adverse experiences (Felitti et al., 1998; Scott, Smith, & Ellis, 2010), susceptibility to environmental conditions in general (Ellis, Boyce, Belsky, Bakermans-Kranenburg, & Van IJzendoorn, 2011), and personality traits (Brandes & Bienvenu, 2006) may be of interest in this regard. Relatedly, examining the mechanisms through which attachment patterns may affect anxiety symptoms, such as emotion regulation capacities (Esbjørn et al., 2012; Mikulincer, Shaver, & Pereg, 2003), is of great importance as well.

Third, this study included only studies that used the AAI for assessing attachment. In doing so, we excluded studies that examined attachment styles in the context of romantic relationships via self-report measures such as the Experiences in Close Relationships (Brennan, Clark, & Shaver, 1998) and the Relationship Scales Questionnaire (Griffin & Bartholomew, 1994). Although the AAI and self-report measures are directed at assessing different attachment figures (primary caregivers vs. romantic partners, respectively) and were shown to be only weakly associated (Roisman et al., 2007), an outstanding question is to what degree do studies using these two instruments converge when assessing links between attachment and anxiety symptoms. In addition, one may ask to what degree attachment self-report measures predict anxiety symptoms above and beyond classifications on the AAI. Future research that focuses on the link between postchildhood attachment and anxiety symptoms using both AAI and self-report measures would clearly help to answer such questions.

Fourth, given that we focused on postchildhood attachment representations, we are limited in our ability to draw conclusions about developmental trajectories in anxiety symptoms stemming from attachment representations early in life. In fact, the results reported here demonstrating that individuals with hyperactivating-attachment strategies (i.e., preoccupied) report higher anxiety symptoms than individuals with deactivating-attachment strategies (i.e., dismissing) stand in contrast to similar meta-analyses conducted with children. Two large-scale meta-analyses (Groh et al., 2012; Madigan et al., 2013) reported associations between insecure attachment patterns in infancy and early childhood and anxiety in childhood that are opposite in direction to what we found here. That is, children classified as insecure-avoidant (parallel to adult insecure-dismissing attachment) but not children classified as insecure-resistant (parallel to adult preoccupied) had more anxiety symptoms during childhood than their secure counterparts. This paradox, which was noted in research regarding depression symptoms (Dagan & Bernard, 2019; Dagan, Facompré, & Bernard, 2018), suggests that the nature of the association between attachment patterns and internalizing symptoms may shift across developmental periods. Future research should attempt to explain the paradoxical findings using a prospective, multimethod study focusing on such links across the life span.

Conclusion

This meta-analysis is the first to examine the link between adult attachment representation as measured in the AAI and anxiety symptoms across a diverse range of clinical and nonclinical populations. The findings suggest that insecure-attachment patterns may be differentially linked to anxiety symptoms. In particular, preoccupied individuals showed elevated rates of anxiety

when compared with both secure and dismissing individuals. We also present strong evidence that unresolved-attachment representations increase risk for anxiety symptoms, but this effect may be primarily driven by preoccupied-attachment representation. We encourage increased clinical attention to the interpersonal aspect of anxiety. Specifically, careful attention should be paid to the support soliciting strategies that underlie preoccupied and unresolved individuals' experience of anxiety. These strategies may shape ineffective support soliciting behaviors, which in themselves may function as risk factors to maintaining or exacerbating anxiety symptoms. Lastly, we encourage future research to thoroughly examine the mechanisms through which attachment patterns confer risk for or offer protection from the development and maintenance of anxiety symptoms.

Transparency

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Author Contributions

O. Dagan, C. R. Facompré, and K. Bernard designed the study. O. Dagan and C. R. Facompré conducted the systematic literature search under the supervision of K. Bernard. O. Dagan, C. R. Facompré, and M. D. Nivison acquired data from authors under the supervision of K. Bernard and G. I. Roisman. O. Dagan and C. R. Facompré coded data. C. R. Facompré conducted the statistical analyses. O. Dagan, C. R. Facompré, and K. Bernard wrote the first draft of the manuscript, and all authors contributed to the final manuscript. All of the authors approved the final version for submission.

Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

ORCID iD

Or Dagan https://orcid.org/0000-0002-4674-5425

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Supplemental Material

Additional supporting information can be found at http://journals.sagepub.com/doi/suppl/10.1177/2167702620917455

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