The Duality of Individual Attachment Characteristics: Trait Attachment and State Attachment

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Abstract

Traditional attachment theory holds that individuals' attachment-related psychological and behavioral patterns possess relative stability; however, in both information processing and individual development, attachment patterns exhibit a dual nature, manifesting both relative stability and situational sensitivity. The attachment patterns that individuals display in specific contexts result from the interaction between relatively stable trait attachment and situational characteristics. The interaction patterns between trait attachment features and attachment priming effects in attachment priming research provide a window into understanding the dual characteristics of attachment and their relationships. The two-stage model of attachment system activation offers a framework for integrating and interpreting these interaction patterns. Future research should optimize the operational examination of priming effects in studies on the relationship between attachment' s dual characteristics, consider the interaction between attachment anxiety and avoidance dimensions, focus on attachment differences within high-anxiety groups to clarify the interaction modes between attachment' s dual features, and concurrently investigate the temporal course of how attachment strategies influence attachment priming effects, as well as explore the mechanisms underlying the interaction between attachment' s dual characteristics.

Full Text

The Duality of Attachment: Trait and State Attachment

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Abstract

Traditional attachment theory posits that individuals' attachment-related psychological and behavioral patterns are relatively stable. However, both information processing and lifespan development research demonstrate that attachment patterns exhibit a fundamental duality—they are simultaneously characterized by relative stability and contextual sensitivity. The attachment patterns individuals display in specific situations result from the interaction between their relatively stable trait attachment characteristics and situational features. Studies examining the interplay between trait attachment and attachment priming effects offer a valuable window into understanding this dual nature and the relationship between trait and state attachment. The two-stage model of attachment system activation provides a comprehensive framework for integrating and explaining these complex interaction patterns. Future research should optimize manipulation checks for priming effects in studies of attachment duality, consider the interactive effects of attachment anxiety and avoidance dimensions, and examine attachment differences within high-anxiety populations to clarify how trait and state attachment interact. Additionally, research should investigate the temporal dynamics through which attachment strategies influence priming effects and explore the underlying mechanisms of trait-state interactions.

Keywords: attachment; attachment priming; trait attachment; state attachment

Attachment theory' s core assumption holds that attachment patterns formed through early life experiences remain relatively stable throughout the lifespan, profoundly influencing interpersonal relationships and personality development (Raby & Dozier, 2019). However, empirical research has challenged this view, with longitudinal studies revealing low correlations between early attachment patterns and those observed in later developmental periods (Fraley & Roisman, 2019). Concurrently, social-cognitive research demonstrates that attachment-related psychology and behavior are susceptible to immediate contextual influences, temporarily manifesting characteristics that diverge from an individual' s dominant long-term attachment pattern (Mikulincer & Shaver, 2016a, 2016b). Thus, individual attachment patterns embody both stability and contextual sensitivity. In other words, attachment-related psychological and behavioral features in context exist in dynamic tension between stability and situationally induced change—like a tree by the roadside that points in its established direction when calm but sways with the wind, returning to its original orientation once the wind subsides.

The social-cognitive paradigm has provided effective tools and new evidence for investigating how contexts shape attachment and how individual attachment characteristics interact with situations. Yet the notion of attachment duality also appears in traditional attachment literature. Following Bowlby (1969/1982) and Ainsworth, Bell, and Stayton (1972), researchers have historically concep-

tualized individual attachment features as traits exhibiting cross-temporal and cross-situational stability. This perspective has focused research on attachment typology, stability, and the developmental impact of early attachment experiences across domains. However, while Bowlby (1969/1982, 1973) emphasized relative stability, he also stressed that attachment systems are context-sensitive —activated or deactivated by situational factors. Methodological limitations prevented systematic investigation of these issues until the past two decades. Drawing on social-cognitive theories and paradigms, researchers have begun examining the cognitive processing mechanisms underlying individual differences in attachment, confirming that attachment-related psychological and behavioral features can temporarily deviate from long-term patterns through situational influences (Fraley, 2007; Gillath, Hart, Noftle, & Stockdale, 2009). Moreover, both stable attachment characteristics and situation-specific features jointly determine individuals' psychological and behavioral responses in attachment-relevant contexts (Mikulincer & Shaver, 2016a).

The tension between stability and change in psychological and behavioral patterns represents a central concern in personality and self research (Conway, Singer, & Tagini, 2004). Understanding how attachment features maintain both stability and contextual sensitivity—and how stable traits interact with situations to shape specific contextual responses—enhances our comprehension of how individuals respond to attachment stimuli and the adaptive significance of attachment behavior in evolution. This paper first discusses the definition of attachment duality and its manifestations in information processing and development, then reviews empirical patterns of interaction between trait attachment and priming effects, and finally integrates these patterns using the two-stage model of attachment system activation to inform future research.

2.1 Defining the Dual Nature of Attachment

Attachment characteristics constitute a constellation or pattern of attachment-related knowledge, emotions, cognitive processing, and behaviors (Fraley & Roisman, 2019). Scholars employ "trait attachment" and "state attachment" to describe relatively stable psychological and behavioral features in attachment contexts versus temporary features that differ from stable patterns due to situational stimulation (Mikulincer & Shaver, 2017). Latent state-trait theory posits that psychological and behavior depend on individual traits, situational features, and their interaction. Since specific contextual features vary with situations, all psychological and behavioral manifestations in particular contexts are, in this sense, state-like (Steyer, Schmitt, & Eid, 1999). Accordingly, attachment features displayed in specific contexts represent state attachment, which is determined by trait attachment, situational characteristics, and their interaction. The following definitions of trait and state attachment are conceptualized within a person-situation framework from an information-processing perspective.

Trait attachment represents the relatively stable and cross-situationally consistent component of attachment characteristics, reflecting individuals' average

attachment features over extended periods. Through prolonged attachment interactions, individuals develop relatively stable attachment representations and schemas, with dominant schemas influencing attachment psychology and behavior in specific contexts. Trait attachment helps individuals avoid disorganization and chaos, maintaining self-identity and continuity, while facilitating explanation and prediction of attachment-related phenomena. Traditional attachment research has followed a typological approach, using attachment categories to describe and organize behavioral features or representations (e.g., Strange Situation, Q-sort, story completion tasks, Adult Attachment Interview, Current Relationship Interview) (Ainsworth et al., 1972; Ainsworth, Salter, & Stayton, 1971; Bretherton, Ridgeway, & Cassidy, 1990; Crowell & Owens, 1996; Hazan & Shaver, 1987; Waters & Deane, 1985). However, dimensional approaches may offer advantages over categorical ones (Fraley, Hundson, Heffernan, & Segal, 2015), with common dimensional measures including the Experiences in Close Relationships Questionnaire and the Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987; Brennan, Clark, & Shaver, 1998). Both approaches share the assumption that stable attachment patterns exist as traits with cross-temporal and cross-situational consistency, capturing attachment features that individuals exhibit across time and contexts—that is, trait attachment.

State attachment represents the psychological and behavioral features emerging from the interaction between trait attachment and specific contextual features. Context includes both exogenous characteristics (e.g., danger cues, attachment figure' s voice or photo) and endogenous features (e.g., memories, mood states). Due to the complexity and variability of situational features, state attachment often manifests as temporary deviations from long-term attachment patterns. State attachment implies that individuals are embedded in their current context, with flexible and modifiable attachment responses that facilitate environmental adaptation. Although Bowlby (1969/1982) proposed that attachment systems are context-sensitive and not static, subsequent researchers treated situational variation merely as a tool for capturing trait attachment—for instance, manipulating situations (separation and reunion) in the Strange Situation to classify infant-mother attachment relationships (Ainsworth, Blehar, Waters, & Wall, 1978). With the cognitive turn in attachment research, investigators have adopted cognitive psychology paradigms, particularly priming, to examine how contextual cues influence attachment-related psychology and behavior (Bryant & Bali, 2018; Gillath & Karantzas, 2018; Mikulincer & Shaver, 2017). In attachment priming research, priming effects represent manifestations or outcomes of state attachment, offering insights into state attachment processes.

Traditional social and personality research often uses "time" as the criterion for distinguishing traits and states—for example, Gillath et al. (2009) used duration of attachment features to differentiate trait and state attachment in their State Adult Attachment Measure (SAAM). The current definitions, however, derive from an information-processing perspective. Trait attachment comprises cross-temporally and cross-situationally stable features formed through long-

term attachment experiences, reflecting average attachment characteristics over time. State attachment represents psychological and behavioral features emerging from the interaction between trait attachment and context, often manifesting as temporary deviations from trait attachment due to situational complexity and change.

2.2 Manifestations of Attachment Duality in Cognitive Processing

Attachment duality is intimately related to top-down and bottom-up processing in information processing. From this perspective, performance in attachment-relevant tasks involves both top-down processing driven by attachment representations and bottom-up processing driven by contextual cues (Mikulincer & Shaver, 2016b), with both determining final psychological and behavioral outcomes. The innate attachment system evaluates current attachment-relevant physical and psychological cues and attachment figure availability, setting attachment goals based on internal working models (Bretherton, 1985). These goals motivate individuals to seek proximity when needed to alleviate distress and protect against threat (Bowlby, 1969/1982, 1973). Ultimately, attachment features result from the joint influence of internal working models and current contextual features (Fraley, 2007; Mikulincer & Shaver, 2016a). While internal working models remain relatively stable, contexts (e.g., presence of danger, proximity of attachment figures) constantly change, causing attachment to exhibit both common features across situations and situation-specific characteristics.

It is crucial to distinguish state attachment from attachment variability in longitudinal research. The former emphasizes temporary changes in attachment features within specific contexts, while the latter concerns changes in trait attachment over extended periods. From a developmental perspective, attachment patterns maintain relative stability over time, yet development, environmental changes, and new attachment relationships can modify existing patterns (Feeney, 2016; Fraley, 2007). This aligns with Piaget' s (1954) concepts of assimilation and accommodation: assimilation maintains relative stability, while accommodation produces change, with their interaction shaping attachment patterns. Although traditional theory emphasizes developmental stability (Fraley & Roisman, 2019), longitudinal research shows an average effect size of approximately 0.15 between childhood rearing environments and adult attachment patterns (Fraley, Roisman, Booth-LaForce, Owen, & Holland, 2013; Chopik, Moors, & Edelstein, 2014). Developmental timing also influences stability, with the socialization-selection asymmetries model suggesting that child attachment patterns show greater variability while adult patterns exhibit greater stability.

In summary, trait attachment is malleable across development, yet within shorter timeframes, individual attachment displays both stable and context-specific features. This duality reflects the evolutionary adaptive significance of attachment—balancing stability and contextual sensitivity to meet environmental demands.

3 Empirical Research on Attachment Duality Using Priming Paradigms

Although Bowlby (1969/1982) proposed that attachment behavior is context-sensitive, traditional measures primarily assessed trait attachment (e.g., Strange Situation, Q-sort, story completion tasks) (Ainsworth et al., 1978; Bretherton et al., 1990; Waters & Deane, 1985), precluding investigation of state attachment and trait-state relationships. The application of priming paradigms now enables simultaneous examination of trait and state attachment within the same task (Birnbaum, Hirschberger, & Goldenberg, 2011; Bryant & Hutanamon, 2018; Hudson & Fraley, 2018; Mikulincer, Hirschberger, Nachmias, & Gillath, 2001; Stupica, Brett, Woodhouse, & Cassidy, 2018). Researchers typically use attachment dimensions (anxiety and avoidance) or attachment types to reflect trait attachment, and priming effects to reflect state attachment or its outcomes. Priming effects are categorized as secure or insecure based on stimulus valence (Gabriel, Kawakami, Bartak, Kang, & Mann, 2010; Granqvist, Mikulincer, Gewirtz, & Shaver, 2012). Importantly, state attachment differs from priming effects in priming paradigms: priming stimuli induce state changes in attachment features, which may subsequently influence non-attachment-related cognition and behavior (e.g., creative problem-solving, group identification, depressive symptoms) (Carnelley, Bejinaru, Otway, Baldwin, & Rowe, 2018; Mikulincer, Shaver, & Rom, 2011; Rosenthal et al., 2012). Only those attachment-related information processing and behavioral changes directly resulting from priming constitute state attachment. Both these direct changes and their downstream effects on non-attachment cognition represent priming effects, which can indirectly reflect state attachment. Thus, interactions between attachment dimensions/types and priming effects provide a window into understanding trait-state relationships.

3.1 Interactions Between Trait Attachment and Secure Priming Effects

Secure attachment priming presents attachment-related stimuli (e.g., names or photos of attachment figures) to activate secure base representations, influencing subsequent psychological and behavioral responses. Secure priming effects show distinct interaction patterns with attachment anxiety. Some research indicates that low-anxiety individuals are more susceptible to secure priming, showing enhanced access to empathic memories (Mikulincer, Gillath, et al., 2001) and more positive emotional experiences (Bryant & Hutanamon, 2018), with no significant effects observed in high-anxiety individuals. Conversely, other studies find opposite patterns: secure priming enhances attachment-related word accessibility (Gokce & Harma, 2018), reduces traumatic memory intrusions (Bryant & Foord, 2016), decreases stress and negative emotion susceptibility (Bryant & Chan, 2017; Schoemann, Gillath, & Sesko, 2012), and increases empathy (Cassidy, Stern, Mikulincer, Martin, & Shaver, 2018) in high-anxiety individuals. At the interpersonal level, high-anxiety individuals show greater relationship main-

tenance tendencies, less dissolution likelihood, higher ratings of social connection strength and relationship multiplicity (Gillath, Karantzas, & Selcuk, 2017), and reduced self-blame breakup strategies (Collins & Gillath, 2012) following secure priming, with no effects found in low-anxiety individuals.

Similar divergent patterns emerge with attachment avoidance. Some studies show that low-avoidance individuals are more responsive to secure priming, demonstrating enhanced empathic memory access (Mikulincer, Gillath, et al., 2001), reduced traumatic memory intrusions (Bryant & Chan, 2017; Bryant & Foord, 2016), increased positive emotionality and reduced stress susceptibility (Bryant & Bali, 2018; Bryant & Chan, 2017; Bryant & Hutanamon, 2018; Schoemann et al., 2012), and greater support-seeking behaviors (Gillath et al., 2006) and online social relationship maintenance (Gillath et al., 2017). However, contrasting findings indicate that high-avoidance individuals are more susceptible to secure priming effects, showing reduced regret-based learning (Schoemann et al., 2012), decreased relationship dissolution tendencies (Gillath et al., 2017), reduced avoidant/withdrawal breakup strategies (Collins & Gillath, 2012), and increased responsiveness to others'needs (Mikulincer, Shaver, Sahdra, & Bar-On, 2013).

Furthermore, secure priming differentially affects anxiety and avoidance dimensions, with repeated secure priming reducing anxiety scores but not avoidance scores (Hudson & Fraley, 2018). Research on attachment types reveals that anxious individuals benefit more from secure priming, showing lower pain intensity ratings (Pan, Zhang, Liu, Ran, & Teng, 2017) and increased comfort-seeking (Evraire, Ludmer, & Dozois, 2014), while secure priming can negatively affect other insecure types (e.g., increasing pain ratings in fearful individuals and decreasing comfort-seeking in avoidant individuals) (Pan et al., 2017; Evraire et al., 2014). Additional factors moderate these interactions; for example, under non-stressful conditions, secure priming increases fearful individuals' preference for abstract materials, but shows no effect under threat (Mikulincer, Hirschberger, et al., 2001).

3.2 Interactions Between Trait Attachment and Insecure Priming Effects

Insecure attachment priming includes threat priming, anxiety priming, and avoidance priming. Threat priming presents attachment-related threats (e.g., separation images, memories) to activate the attachment system (Gabriel et al., 2010; Marks & Vicary, 2016; Rosenthal et al., 2012). Rather than activating specific attachment schemas, threat stimuli activate the system generally (Bretherton, 1985), after which the most chronically accessible attachment representation becomes activated to drive subsequent processing. Anxiety and avoidance priming specifically activate schemas related to attachment anxiety and avoidance, temporarily altering current attachment states (Boag & Carnelley, 2016; Jarvinen & Paulus, 2017; Melen, Pepping, & O' Donovan, 2017).

Threat priming shows varied interaction patterns with both attachment anxiety and avoidance. Regarding anxiety, some studies find threat priming affects low-anxiety individuals (reducing romantic-sexual desire) but not high-anxiety individuals (Birnbaum et al., 2011), while others show the opposite: threat priming reduces distance-related word accessibility (Marks & Vicary, 2016) and positive ratings of abstract materials in high-anxiety individuals (Mikulincer, Hirschberger, et al., 2001), with no effects in low-anxiety individuals. For avoidance, threat priming increases accessibility of attachment figure names in low-avoidance but not high-avoidance individuals (Mikulincer, Gillath, & Shaver, 2002), yet other research finds opposite patterns: under threat, higher avoidance correlates with greater attentional breadth toward partner photos in men (Dewitte & Koster, 2014), and threat priming reduces sexual desire in high-avoidance women while increasing it in high-avoidance men (Birnbaum et al., 2011), with no effects in low-avoidance individuals. Task characteristics also moderate these interactions; for instance, threat priming reduces accessibility of attachment-related words but not neutral words as avoidance increases (Granqvist et al., 2012).

Limited research examines threat priming interactions with attachment types, though one study found that threat priming makes secure individuals more open and aggressive (supporting liberal candidates) while making insecure individuals more conservative (Weise et al., 2008). Task characteristics and cognitive states further moderate these effects: under threat, no differences emerge among secure, avoidant, and anxious individuals in attachment word accessibility, but anxious and secure individuals show higher accessibility for psychological distance words than avoidant individuals. Under low cognitive load, avoidant individuals respond similarly to secure individuals on psychological words, but under high load, both avoidant and anxious individuals respond faster than secure individuals (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000).

Research on anxiety and avoidance priming interactions with trait attachment remains scarce, though anxiety priming interacts with trait attachment, particularly anxiety. Anxiety priming increases food consumption in low-anxiety but not high-anxiety individuals (Wilkinson, Rowe, & Heath, 2013), and reduces desire for intimacy while making self and other representations more negative in sexual fantasies among high-anxiety men (Birnbaum, Simpson, Weisberg, Barnea, & Assulin-Simhon, 2012). Notably, repeated anxiety priming reduces anxiety levels in high-anxiety individuals (Hudson & Fraley, 2018), possibly because the narrative recall paradigm facilitates working through negative relationship beliefs (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008). Anxiety priming may also deactivate avoidant individuals' deactivating strategies, increasing personal distress in empathic contexts (Mikulincer, Gillath, et al., 2001), likely because recalling negative relationship memories constitutes an additional threat that impairs avoidance strategy use (Mikulincer & Florian, 2001).

Despite robust evidence for trait-state interactions, numerous studies demonstrate independent effects, where priming effects operate independently of trait

attachment. At the individual level, physiological responses to threat (heart rate, skin conductance, facial expressions), response inhibition, and frustration-induced emotional reactions show no interactions between secure priming and attachment dimensions (Bryant & Hutanamon, 2018; Karreman, Vingerhoets, & Bekker, 2019; Li et al., 2016; Stupica et al., 2018). Similarly, autobiographical memory coherence, memory specificity, negative memory intrusions, positive emotion accessibility, emotional responses to frustration, and negative emotion management are unaffected by attachment dimensions following secure priming (Bryant & Bali, 2018; Bryant & Foord, 2016; Clear & Zimmer-Gembeck, 2017; Mikulincer, Gillath, et al., 2001; Mikulincer, Hirschberger, et al., 2001). Interpersonal research consistently shows independent effects on romantic jealousy, cyber aggression, prejudice, interpersonal stress, personalization strategies, empathy, help-seeking, and support provision (Bartz, Tchalova, & Fenerci, 2016; Gillath et al., 2006; Liu, Huo, Chen, & Song, 2018; Mikulincer, Gillath, et al., 2001; Mikulincer et al., 2013; Pardess, Mikulincer, Dekel, & Shaver, 2014; Saleem et al., 2015; Selterman & Maier, 2013). For example, secure priming and trait attachment independently affect empathic responses to others' needs: secure priming increases self-reported empathy while anxiety and avoidance decrease it, without interaction (Mikulincer, Gillath, et al., 2001).

Insecure priming studies similarly show independence between trait and state attachment. Threat priming increases accessibility of attachment figure names (e.g., mother, deceased relatives) independently of attachment anxiety and avoidance (Carr & Landau, 2012; Mancini & Bonanno, 2012; Mikulincer et al., 2002). Stress priming increases accessibility of proximity-related concepts (Mikulincer et al., 2000). Research on cognitive openness toward God-related concepts finds no interactions between anxiety priming, avoidance priming, or secure priming and attachment dimensions (Jarvinen & Paulus, 2017). Thus, both secure and insecure priming conditions yield evidence for independent trait-state effects.

4 Explaining Trait-Priming Interaction Patterns: The Two-Stage Model of Attachment System Activation

Empirical research reveals complex and sometimes contradictory interaction patterns between trait attachment and priming effects. Attributing these inconsistencies to error variance is inadequate. Clarifying these patterns within a unified theoretical framework enhances understanding of attachment duality' s nature, function, and interrelationships. Traditional attachment theory comprises two components: (1) a normative aspect concerning universal features of attachment system functioning and development, and (2) an individual differences aspect concerning variations in system operation (Bowlby, 1969/1982). Correspondingly, Mikulincer and Shaver (2016a) proposed the two-stage model of attachment system activation to explain how situational stimuli influence attachment psychology and behavior, providing a framework for integrating these complex interaction patterns.

Mikulincer and Shaver (2016a) posit that threat appraisal automatically

activates the attachment system in two stages. Stage one involves subconscious activation following threat detection, automatically increasing accessibility of attachment-related representations, thoughts, and behavioral tendencies. This stage corresponds to the normative component of attachment theory—the core tenet that threat perception activates the attachment system regardless of trait attachment (Bowlby, 1969/1982). Insecure priming research supports this: threat, anxiety, and avoidance priming increase accessibility of attachment figures and proximity-related representations independently of attachment dimensions (Carr & Landau, 2012; Jarvinen & Paulus, 2017). Since stage one activates attachment and intimacy representations, directly activating these representations should produce similar effects. Indeed, secure priming stimuli increase accessibility of attachment representations (Bryant & Bali, 2018), inhibit negative representations and emotions, and enhance positive emotions (Bryant & Foord, 2016; Clear & Zimmer-Gembeck, 2017). These activated positive representations and emotions dominate current mental states, enabling more positive, flexible, and open threat responses (Bryant & Hutanamon, 2018; Stupica et al., 2018) and interpersonal interactions (Bartz et al., 2016; Liu et al., 2018; Pardess et al., 2014; Saleem et al., 2015; Selterman & Maier, 2013). Both threat-induced activation and direct secure representation activation influence subsequent psychology and behavior. Although the normative component suggests universal activation upon threat perception, individual threat appraisal may be influenced by trait attachment. Thus, Mikulincer and Shaver (2016a) propose that stage one activation is modulated by excitatory and inhibitory circuits associated with hyperactivating and deactivating attachment strategies. Empirical support includes findings that threat priming increases accessibility of attachment figure names in low-avoidance but not high-avoidance individuals (Mikulincer et al., 2002), reduces positive emotion activation in high-anxiety but not low-anxiety individuals (Mikulincer, Hirschberger, et al., 2001), and enhances empathic memory access in low-anxiety and low-avoidance but not high-anxiety and high-avoidance individuals (Mikulincer, Gillath, et al., 2001).

Stage two involves how subconscious activation of attachment representations shapes current psychological states and influences behavioral plans even before conscious awareness, evoking conscious intimacy-seeking thoughts that dominate subsequent activities and often translate into observable proximity-seeking behavior. In this stage, trait attachment based on attachment history plays a more prominent role, with individual differences becoming more apparent. The varied interaction patterns between trait attachment and priming effects likely reflect differences in preferred attachment representations and strategies among individuals with different trait attachment profiles. Secure individuals (low anxiety and avoidance) typically employ secure base strategies, showing positive information processing and interpersonal interactions, whereas high-anxiety and high-avoidance individuals prefer hyperactivating and deactivating strategies, respectively, exhibiting negative processing and interactions (Dykas & Cassidy, 2011).

Attachment anxiety reflects the perceived availability of attachment figures

when needed and fear of rejection and abandonment (Moura-Ramos, Santos, & Canavaro, 2017). High-anxiety individuals typically use hyperactivating strategies, maintaining chronic vigilance for attachment information, intense worry, and compulsive efforts to obtain love and support (Mikulincer & Shaver, 2016b). Regardless of anxiety level, secure priming enhances accessibility of secure base representations and emotions (Bryant & Hutanamon, 2018; Gokce & Harma, 2018; Mikulincer, Gillath, et al., 2001). However, since high-anxiety individuals already maintain high baseline accessibility of attachment representations, low-anxiety individuals may show stronger priming effects. Conversely, the enhanced secure base activation in high-anxiety individuals may produce stronger feelings of attachment security, leading to more positive subsequent cognition and behavior (Bryant & Foord, 2016; Cassidy et al., 2018; Schoemann et al., 2012). Low-anxiety individuals, already relatively secure, show smaller priming effects, making high-anxiety individuals more likely to demonstrate secure priming effects in these contexts. Research reveals two distinct outcomes of secure priming in high-anxiety individuals: (1) positive effects producing more adaptive information processing and interpersonal functioning (Bryant & Chan, 2017; Cassidy et al., 2018; Gillath et al., 2017; Gokce & Harma, 2018), and (2) null effects (Bryant & Hutanamon, 2018; Mikulincer, Gillath, et al., 2001; Mikulincer et al., 2011). These divergent results likely stem from the dual-valence nature of anxious individuals' attachment networks, containing both positive (secure/intimate) and negative (insecure) representations (Mikulincer & Shaver, 2007). If priming activates positive representations, secure priming effects emerge; if it activates negative representations through association with negative experiences, null or negative effects result (Mallinckrodt et al., 2013). Under insecure priming, particularly threat priming, high-anxiety individuals experience heightened insecurity and adopt defensive strategies, leading to more negative cognition and behavior (e.g., more negative emotional experiences) (Mikulincer, Hirschberger et al., 2001). Low-anxiety individuals, being more secure, respond more positively to threat (Rosenthal et al., 2012) and show fewer maladaptive behaviors (Birnbaum et al., 2011). Notably, Hudson and Fraley (2018) found that repeated anxiety priming reduces anxiety in high-anxiety individuals, possibly because the narrative recall paradigm facilitates working through negative relationship beliefs (Bartholomew & Horowitz, 1991; Fredrickson et al., 2008). This suggests that supraliminal insecure priming effects largely depend on subjective stimulus evaluation, consistent with Mikulincer and Shaver' s (2016) framework.

Attachment avoidance reflects efforts to maintain behavioral independence and emotional distance from attachment figures (Moura-Ramos et al., 2017). High-avoidance individuals prefer deactivating strategies, suppressing attachment system activation to avoid potential distress (Dykas & Cassidy, 2011; Mikulincer & Shaver, 2016). When secure priming enhances attachment-related cognition and behavior, low-avoidance individuals show stronger effects, responding to threat with greater openness and positivity and engaging in more adaptive information processing and interpersonal interactions (Bryant & Chan, 2017; Bryant

& Foord, 2016; Gillath et al., 2017; Gillath et al., 2006; Mikulincer, Gillath, et al., 2001; Mikulincer et al., 2011). High-avoidance individuals typically suppress accessibility of attachment-related stimuli when threatened (Dewitte & Koster, 2014; Granqvist et al., 2012), making them less responsive to secure priming. However, when secure priming reduces attachment-related negative behaviors, high-avoidance individuals show stronger effects (Collins & Gillath, 2012; Gillath et al., 2017; Mikulincer et al., 2013), likely because low-avoidance individuals already engage in positive processing with minimal negative behaviors. It is important to note that high-avoidance individuals' perception of "threat" is subjectively determined—even objectively safe stimuli can trigger deactivating strategies if evaluated as threatening (Evraire et al., 2014). These strategies are not universally effective; they fail when cognitive resources are depleted, being effective under low but not high cognitive load (Mikulincer et al., 2000).

In summary, secure priming effects manifest in two ways: enhancing adaptive attachment-related cognition and behavior in secure individuals (low anxiety and avoidance), and reducing negative attachment-related cognition and behavior in insecure individuals (high anxiety and avoidance). For threat priming, attachment security generally enables effective threat coping, while high-anxiety and high-avoidance individuals tend to employ hyperactivating and deactivating strategies, respectively. Both trait attachment and state attachment induced by priming stimuli jointly determine individuals' performance in specific contexts.

5 Limitations and Future Directions

Individuals' attachment-related psychology and behavior in specific contexts result from the interaction and joint determination of trait attachment and context-induced state attachment. Attachment patterns exist in dynamic tension between stability and change. This duality ensures both identity continuity and adaptive environmental responsiveness. The diverse interaction patterns between trait attachment and priming effects provide empirical evidence for understanding attachment duality, while the two-stage model offers a framework for integrating these findings. However, significant disagreements and limitations remain, requiring further investigation.

5.1 Optimizing Manipulation Checks in Attachment Duality Research

A major limitation in current priming research on attachment duality is the absence of manipulation checks in most studies, forcing researchers to infer priming effectiveness post-hoc without direct evidence. This omission stems from concerns that checks may reveal experimental purposes or weaken already subtle priming effects (Birnbaum et al., 2012). Some studies have attempted separate validation samples, such as Birnbaum et al. (2012) who recruited additional participants to rate fear of abandonment after priming, finding higher scores in the anxiety priming condition. Schoemann et al. (2012) coded priming imagery content to ensure compliance but did not directly assess priming effects. Deng

et al. (2016) used post-priming ratings of felt security, warmth, support, and desire to hug to assess secure activation, while Pan et al. (2016) compared state attachment questionnaire scores before and after priming. These methods only apply to supraliminal priming. Future research should optimize supraliminal priming checks and develop methods suitable for subliminal priming.

5.2 Considering Interactions Between Attachment Dimensions in Duality Research

Most attachment duality research uses anxiety and avoidance dimensions as trait attachment indicators, a practice justified by dimensional advantages (Fraley et al., 2015). However, many studies analyze anxiety and avoidance separately without examining their interaction (Gillath et al., 2015; Marks & Vicary, 2015; Mikulincer et al., 2014). Yet three-way interactions among priming, anxiety, and avoidance have emerged: Pan et al. (2016) found that for high-anxiety individuals, secure priming reduced pain picture ratings when avoidance was high but increased ratings when avoidance was low, with no effects in low-anxiety individuals regardless of avoidance. Schoemann et al. (2012) reported three-way interactions where secure priming reduced regret in high-anxiety/low-avoidance individuals, increased error-based learning in high-anxiety/high-avoidance individuals, and decreased it in low-anxiety/high-avoidance individuals, with no effects in other groups. Future priming research using dimensional measures should consider anxiety-avoidance interactions.

5.3 Deepening Understanding of Anxious Attachment and Priming Effects

Current research shows inconsistent patterns between high attachment anxiety and priming effects. Some studies find negative effects of insecure priming in high-anxiety individuals (reduced positive emotion, group identification) (Mikulincer, Hirschberger, et al., 2001; Rosenthal et al., 2012; Mallinckrodt et al., 2013), while others show null effects (Birnbaum et al., 2011) or even anxiety reduction through repeated anxiety priming (Hudson & Fraley, 2018). These inconsistencies likely relate to the dual-valence nature of anxious individuals' attachment networks, containing both positive and negative representations (Mikulincer & Shaver, 2007). Activating different representations produces different outcomes. Future research should examine this dual-valence nature using targeted priming materials to clarify why high anxiety produces divergent priming effects.

5.4 Investigating the Temporal Dynamics of Priming-Trait Interactions

According to the two-stage model, two processes occur between stimulus presentation and response (Mikulincer & Shaver, 2016). Stage one is more automatic, while stage two involves greater trait attachment influence. Avoidant individuals' deactivating strategies and anxious individuals' hyperactivating strategies

have unclear temporal dynamics in information processing. Do these strategies operate during stimulus appraisal or during response generation? Future research should examine this question from a temporal processing perspective. Additionally, whether these strategies require conscious participation warrants investigation. Research shows that subliminal priming effects on creative problem-solving are independent of trait attachment, whereas supraliminal priming enhances performance only in low-anxiety individuals (Mikulincer et al., 2011), suggesting conscious involvement may be necessary for anxious individuals' strategies to operate—a question deserving further attention.

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Note: Figure translations are in progress. See original paper for figures.