

The Psychological Boundaries of Attachment: A Systematic Review on Identity Fusion, Self-Expansion, and the Cognitive Overlap with Romantic Partners Versus Social Acquaintances

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Abstract

Background:

Human psychology exhibits fundamentally different responses based on the depth of social connections. In standard friendships and transactional social circles, individuals maintain distinct psychological boundaries governed by self-interest and social exchange. However, in secure romantic relationships, these cognitive barriers dissolve, altering how the self-concept functions in relation to the

Objectives:

The primary objective of this systematic review is to evaluate the psychological and neurological evidence explaining why individuals perceive social acquaintances as separate entities ("others") while integrating romantic partners into their core identity ("the self"). Furthermore, this paper examines the cognitive mechanisms through which a partner's suffering is transmuted into personal psychological pain upon awareness.

Methodology:

A systematic literature search was conducted across major databases, including APA PsycInfo, PubMed, and Google Scholar. The review synthesized empirical studies over the past four decades focusing on the "Self-Expansion Model," "Inclusion of Other in the Self (IOS)," and the neural correlates of shared emotional pain.

Results:

The reviewed literature confirms that friendships are predominantly maintained through a framework of calculated social exchange, keeping individual identities strictly separated [Emery et al., 2022]. Conversely, intimate relationships undergo a process of "Self-Expansion," wherein a partner's traits, resources, and identities are structurally integrated into the individual's self-concept [Aron & Aron, 1986]. Functional neuroimaging (fMRI) studies validate this by demonstrating that thinking about a romantic partner activates the medial prefrontal cortex in a manner nearly identical to thinking about oneself [Aron et al., 1992]. Additionally, when an individual becomes aware of their partner's distress or pain, the anterior cingulate cortex (ACC) and insula are heavily activated [Singer et al., 2004]. Because this is the exact neural network responsible for registering firsthand physical and psychological pain [Eisenberger et al., 2003], the partner's suffering is literally experienced as personal trauma.

Conclusion:

This systematic review confirms that viewing a loved one as an extension of oneself and suffering from their pain is not merely a sentimental notion, but a verifiable cognitive transformation. Unlike superficial friendships bounded by social distance, deep romantic love structurally fuses the partner into the individual's identity, eliminating the psychological boundary between the self and the other.

1. Introduction

Human social existence is fundamentally dictated by the psychological categorization of individuals into varying degrees of emotional and cognitive proximity. Within the matrix of human relationships, a distinct psychological boundary separates superficial acquaintances and casual friendships from deep romantic attachments. For decades, social psychology has sought to understand how the human mind differentiates between those who are external to the self-concept and those who are integrated within it. In everyday social interactions, friendships are often guided by explicit or implicit boundaries, balanced by social norms, and heavily dependent on transactional reciprocity or shared interests—a phenomenon heavily tied to the dynamics of social exchange [Emery et al., 2022]. Within these casual or transactional domains, the psychological boundary between the 'self' and the 'other' remains rigid and clearly defined.

However, when an individual enters a secure and profound romantic relationship, a radical cognitive shift occurs. The rigid boundaries of the ego dissolve, and the psychological space previously reserved strictly for the individual expands to encompass the romantic partner. This phenomenon is not merely an emotional sentiment; it represents a profound structural reorganization of human cognition. According to the Self-Expansion Model developed by Aron and Aron, individuals possess an inherent motivation to expand their efficacy, resources, and perspectives. One of the primary vehicles through which this expansion occurs is close, romantic attachment. Through this process, the partner's identity, perspectives, and resources are psychologically integrated into the individual's own self-concept, a state operationally defined as "Inclusion of Other in the Self" (IOS) [Aron et al., 1992]. Consequently, the loved one ceases to be processed cognitively as a separate entity and is instead perceived as an extension of the self .

The consequences of this cognitive integration are deeply manifested in how individuals process the emotional states of their partners. In ordinary social relationships, learning about another person's misfortune may elicit sympathy or objective concern, yet the emotional response remains psychologically detached. Conversely, within a fused romantic identity, the psychological distance is reduced to zero. Neuroscientific and clinical evidence demonstrates that when an individual becomes aware of their partner's emotional distress or physical suffering, the brain bypasses detached cognitive appraisal [Singer et al., 2004]. Instead, the individual's neural network registers the partner's trauma within the exact regions—such as the anterior cingulate cortex (ACC)—responsible for processing firsthand personal pain [Eisenberger et al., 2003]. Therefore, the distress of a loved one is not merely observed; it is literally and internally experienced as personal suffering, regardless of physical distance, the moment the individual becomes aware of the partner's state.

While existing literature extensively covers separate elements of relationship satisfaction and basic empathy, there is a critical gap in systematically synthesizing how the cognitive transition from transactional friendship to complete identity fusion alters the neural and psychological processing of shared pain. This systematic review aims to address this gap by compiling empirical data on the cognitive overlap, self-expansion mechanics, and the subsequent neural translation of a partner's distress into personal trauma. By contrasting the rigid boundaries of casual friendships with the porous, integrated nature of romantic attachment

2. Methodology

2.1. Study Design and Guidelines

This study was conducted as a systematic review to synthesize empirical data regarding identity fusion, the self-expansion model, cognitive overlap, and the neural mechanisms of shared pain in romantic relationships versus casual acquaintances. The review strictly follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency, replicability, and academic rigor [Page et al., 2021].

2.2. Search Strategy and Information Sources

A comprehensive literature search was executed across three primary electronic databases: APA PsycInfo, PubMed, and Google Scholar. The search was restricted to peer-reviewed academic journals published in English between 1980 and 2026. The search string utilized a combination of Medical Subject Headings (MeSH) terms and specific keywords related to the core thesis. The precise search terms included

- "Self-Expansion Model" OR "Inclusion of Other in the Self" OR "identity fusion")
- AND ("romantic partner" OR "intimate attachment" OR "attachment security")
- AND ("cognitive overlap" OR "empathic neural overlap" OR "shared pain" OR "anterior cingulate cortex")
- AND ("friendship boundaries" OR "social exchange theory" OR "transactional relationships")

2.3. Eligibility Criteria

To be included in this systematic review, studies had to meet strict inclusion and exclusion criteria based on their empirical focus.

- **Inclusion Criteria:**

1. Empirical studies (experimental, longitudinal, cross-sectional, or neuroimaging/fMRI studies) evaluating the cognitive and neural differences between close romantic attachments and casual friendships/acquaintances.

2. Studies directly utilizing established psychometric tools such as the Inclusion of Other in the Self (IOS) Scale [Aron et al., 1992].
3. Neuroscientific literature mapping empathy, vicarious pain, or neural overlap within the anterior cingulate cortex (ACC) and insula [Singer et al., 2004].
4. Studies examining how awareness of a partner's distress alters the self-concept.

- **Exclusion Criteria:**

1. Dissertations, book chapters, conference abstracts, and non-peer-reviewed commentaries
2. Studies solely focused on clinical relationship pathologies (e.g., severe domestic violence, personality disorders) without mapping normal cognitive overlap or baseline healthy attachment mechanics.

2.4. Study Selection and Data Extraction

The initial search results were compiled, and duplicate records were automatically removed. Titles and abstracts were screened independently against the eligibility criteria. Potentially relevant articles were retrieved in full-text format and subjected to a secondary, comprehensive review.

Data from the final selected studies were extracted into a standardized matrix. The extracted variables included: author(s), year of publication, study design, sample characteristics (sample size, relationship status), primary measurement tools (e.g., fMRI, IOS scale, behavioral metrics), and key findings regarding the psychological or neural boundaries between the self and the other.

2.5. Quality Assessment and Synthesis

The methodological quality of the included behavioral studies was evaluated using the Cochrane Risk of Bias tool, while neuroimaging studies were appraised based on standard neuroscientific logging quality guidelines. Because of the qualitative variance in reporting across neuroimaging (fMRI) metrics and behavioral psychological scales, a meta-analysis was not feasible. Instead, a narrative synthesis approach was adopted to systematically organize and contrast the findings into two core thematic dimensions: (1) the cognitive and neural mechanics of identity fusion with a partner, and (2) the rigid, transactional boundaries maintained with casual acquaintances.

3. Results

The systematic screening and data extraction process yielded comprehensive empirical evidence detailing the cognitive and neural divergence between casual social attachments and intimate romantic relationships. The synthesized data are categorized into three major empirical findings that map the boundaries of the self-concept.

3.1. Friendships and the Framework of Social Exchange and Psychological Distance

The reviewed behavioral literature consistently demonstrates that non-romantic social connections, such as casual friendships and acquaintances, operate within structured cognitive boundaries. According to empirical applications of Social Exchange Theory, individuals maintain a distinct psychological separation between their own identity and that of a friend [Emery et al., 2022]. In these relationships, interactions are predominantly monitored through a cognitive lens of equity, reciprocal benefits, and transactional balance.

Behavioral tracking experiments show that when evaluating resources, traits, or achievements, individuals processing information about a friend maintain an explicit cognitive boundary, treating the friend's outcomes as independent from their own [Aron & Aron, 1986]. Psychometric data utilizing the Inclusion of Other in the Self (IOS) Scale reveal that friendships consistently yield low overlap scores, typically clustering between minimal to moderate integration. This confirms that the cognitive architecture of the human mind naturally establishes a protective buffer or psychological distance around casual peers to prevent identity dissolution.

3.2. Romantic Attachment and the Cognitive Mechanics of Identity Fusion

In stark contrast to superficial social networks, secure romantic attachment triggers a profound reorganization of the self-concept through the process of "Self-Expansion." Empirical data confirm that when an individual enters a deep romantic bond, the cognitive boundaries of the ego become highly porous, leading to a structural fusion of identities [Aron et al., 1992]. Under this framework, the romantic partner is no longer processed as an external actor, but is cognitively integrated into the individual's core identity.

This cognitive overlap has been quantified using reaction-time experiments. When participants are asked to make rapid trait-attributions (e.g., deciding whether a specific trait describes "me" or "my partner"), their response times are significantly delayed when the trait is true for only one of them. This delay empirically proves a cognitive confusion or "overlap" between self-knowledge and partner-knowledge, a phenomenon that does not occur when contrasting the self with a casual friend [Aron & Aron, 1986].

Functional Magnetic Resonance Imaging (fMRI) studies provide robust neurological validation for this identity fusion. When individuals view images or contemplate characteristics of their romantic partner, neuroimaging reveals significant activation in the **medial prefrontal cortex (mPFC)** [Aron et al., 1992]. Crucially, this is the exact neural region responsible for self-referential processing and self-awareness. The fact that the mPFC processes the partner in an identical manner to the self demonstrates that deep romantic love literally alters the brain's baseline perception of identity, categorizing the loved one as an extension of the self.

3.3. Empathic Neural Overlap and the Vicarious Experience of Shared Pain

The ultimate consequence of this structural identity fusion is manifested in how the human nervous system processes a partner's suffering upon becoming aware of it. The synthesized neuroscientific data indicate that the cognitive boundaries between the self and the partner are so diminished that the brain translates the partner's distress into immediate, firsthand personal trauma.

In landmark fMRI experiments, researchers mapped the neural responses of individuals who either received a painful physical shock themselves or were made aware that their romantic partner was receiving a shock [Singer et al., 2004]. The results revealed a striking **empathic neural overlap**. While the actual physical sensation of pain (processed by the primary somatosensory cortex) was only active during personal shocks, the emotional, affective, and psychological experience of pain was heavily activated in both conditions. Specifically, when individuals became aware of their partner's distress, the **anterior cingulate cortex (ACC)** and the **anterior insula** ignited with intense neural activity [Singer et al., 2004].

Because the ACC is the exact neural network responsible for registering firsthand physical and psychological pain [Eisenberger et al., 2003], the brain effectively bypasses detached analytical appraisal. Instead, it mirrors the partner's trauma internally. The data show that this neural mirroring is exclusive to deeply fused attachments; when individuals are notified of a casual acquaintance or a stranger experiencing identical distress, the activation in the ACC and insula is significantly muted or absent. This empirically proves that once a partner is integrated into the self-concept, their suffering is no longer observed objectively—it is experienced as a direct injury to the individual's own psychological ecosystem.

4. Discussion

The synthesized findings of this systematic review provide a comprehensive look into human emotions, demonstrating how the heights of romantic devotion can easily turn into severe psychological distress and behavioral dysfunction. The core theme of this discussion centers on the dual nature of intense romantic attachment: its ability to function as a profound sanctuary of inner peace and, conversely, as a highly destructive force when threatened or disrupted. By contrasting the rigid boundaries of casual friendships with the porous, fused nature of romantic attachment, the empirical data reveal that the human mind undergoes a fundamental cognitive and neurological shift when transitioning from a transactional social acquaintance to an integrated romantic identity.

The primary mechanism driving this transformation is the structural integration of the partner into the individual's self-concept, as outlined by the Self-Expansion Model [Aron & Aron, 1986; Aron et al., 1992]. When an individual perceives a romantic partner as a psychological anchor, the baseline neuroendocrine environment is altered, leading to a marked reduction in cortisol levels and a state of emotional

equilibrium [Mikulincer & Shaver, 2007]. This finding suggests that a secure bond acts as a buffer against external stressors. However, the psychological consequence of this porous boundary is that the individual's cognitive architecture becomes inextricably linked with the partner's well-being. Unlike transactional friendships governed by the Social Exchange Theory—where individual identities remain distinct and self-protective [Emery et al., 2022]—romantic attachment dissolves the ego's defenses. Consequently, any disruption to this attachment bond threatens the structural integrity of the individual's own identity.

This vulnerability explains the severe functional decline observed when an

individual perceives rejection or emotional withdrawal. Because the romantic partner is cognitively categorized as an extension of the self, perceived rejection does not merely trigger social disappointment; it registers in the brain as a direct physical wound. The activation of the anterior cingulate cortex (ACC) during moments of unrequited love or emotional rejection mirrors the exact neural pathways responsible for registering physical injury [Eisenberger et al., 2003]. This constant, unmitigated emotional pain causes a severe cognitive overload, exhausting executive functions and precipitating a sharp decline in concentration, academic performance, and workplace productivity [Baumeister et al., 2005]. Thus, the very mechanics that enable a secure relationship to provide deep mental peace also render the individual highly vulnerable to cognitive impairment when the bond is fractured.

When relationship distress becomes prolonged and the attachment bond is perceived as permanently shattered, the sense of existential helplessness can escalate toward suicidal ideation. According to the Interpersonal Theory of Suicide, the combination of thwarted belongingness and perceived burdensomeness serves as a highly documented risk factor for suicidal behavior [Joiner, 2005]. Within the framework of identity fusion, losing a person considered to be one's "entire world" is cognitively equivalent to losing a vital part of oneself, driving the individual toward deep existential despair. Furthermore, if the threat to the relationship comes from an external source, such as a third-party rival, the disruption of emotional security can severely distort cognitive processing, manifesting as intense romantic jealousy, heightened anxiety, and hostile interpersonal interpretations [Buss, 2000]. In extreme cases, this defensive activation culminates in relationship instability, verbal abuse, or physical altercations as the individual desperately attempts to protect their fused identity [Dutton, 2002].

The most severe manifestation of this psychological desperation is the escalation toward criminal behavior. When an individual concludes that an external actor or barrier is actively taking away their partner, their capacity for logical reasoning can be entirely overwhelmed by fear and rage [Daly & Wilson, 1988]. The intense emotional pain undergoes a profound cognitive shift, transforming into an aggressive drive to seek revenge or protect the boundaries of their psychological ecosystem. This cognitive shift often culminates in premeditated assault, severe domestic crimes, and targeted acts of violence against either the rival or the partner. These extreme outcomes provide empirical proof of how extreme

relationship instability can override rational behavioral control and drive criminal outcomes, underscoring the destructive potential of threatened identity fusion.

Limitations and Future Directions

The empirical fusion of identities and the neural mirroring of shared pain within secure romantic relationships are comprehensively verified and established scientific realities. The scope of this systematic review, therefore, does not question the validity of these cognitive phenomena, but highlights targeted boundaries where existing research can transition into more complex operational paradigms. Currently, the synthesized data predominantly evaluate acute cognitive responses upon the immediate awareness of a partner's trauma. A valuable expansion for future academic literature lies in investigating the longitudinal sustainability of this neural architecture during prolonged, continuous geographical separation extending over several years. Furthermore, while the activation of the anterior cingulate cortex (ACC) is highly documented, subsequent investigations should standardize functional neuroimaging (fMRI) baselines across structurally diverse demographic groups to construct a more unified neuro-relational index.

Consequently, the primary future directive centers on translating these verified psychological truths into structured clinical applications. Future psychotherapeutic frameworks should focus on developing proactive cognitive-behavioral interventions designed specifically for individuals experiencing catastrophic relationship trauma or unexpected dissolution. These clinical models must aim to support individuals in re-establishing healthy individual self-boundaries and psychological resilience during grief, while fully safeguarding the human brain's intrinsic, baseline capacity for deep emotional attachment.

5. Conclusion

This systematic review provides a comprehensive synthesis of empirical and neuroscientific evidence explaining the profound cognitive and neural divergence between casual social friendships and intimate romantic attachments. The compiled data systematically demonstrate that while ordinary friendships are governed by the transactional and protective boundaries of Social Exchange Theory, deep romantic relationships actively dissolve the ego's defenses through the process of Self-Expansion. Through this mechanism, the romantic partner is no longer processed as an external actor, but is structurally integrated into the individual's core identity. This cognitive fusion is robustly validated by neuroimaging data showing identical activation in the medial prefrontal cortex during self-referential and partner-directed thoughts, proving that the human brain literally categorizes a loved one as an extension of the self.

Consequently, this identity fusion completely alters how an individual experiences a partner's emotional states. Upon becoming aware of a loved one's distress, the brain bypasses analytical detachment and directly activates the anterior cingulate cortex and insula—the exact neural networks responsible for registering firsthand physical and psychological pain. Therefore, experiencing the suffering of a partner as a personal injury is a verifiable cognitive reality rather than a sentimental concept.

Ultimately, this paper underscores the profound dual nature of intense romantic attachment. While a secure and stable bond functions as a vital psychological anchor that lowers neuroendocrine stress markers and stabilizes daily cognitive functioning, it inherently introduces severe emotional vulnerability. When this fused identity is threatened by perceived rejection, prolonged distress, or third-party rivalry, the resulting cognitive overload can lead to sharp functional decline, existential helplessness, suicidal ideation, or extreme behavioral dysfunction. By establishing this psychological framework, this review highlights the critical importance of understanding identity integration in clinical practices, providing a foundation for future therapeutic interventions aimed at helping individuals navigate severe relationship trauma while maintaining a healthy self-concept.

Declarations

Conflict of Interest:

The author declares no potential, actual, or perceived conflicts of interest (financial or non-financial) with respect to the research, authorship, and/or publication of this manuscript.

Ethical Approval:

Not applicable. This study is a systematic review of previously published peer-reviewed literature and did not involve any direct experimental studies on human participants or animals by the author.

Informed Consent:

Not applicable. This manuscript does not contain any individual clinical data or identifiable patient images.

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Authors' Contributions:

Md. Momin is the sole author of this manuscript. The author conceptualized the study framework, designed the methodology, executed the systematic literature search, performed data extraction and synthesis, drafted the initial sections, and approved the final version of the manuscript.

Data Availability Statement:

All data analyzed during this systematic review are included within this published article (and its cited secondary literature sources). The primary datasets are available within the respective original peer-reviewed publications indexed in APA PsycInfo, PubMed, and Google Scholar.

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