Attachment and social networks
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The current review covers two lines of research linking attachment and social networks. One focuses on attachment networks (the people who fulfill one’s attachment needs), examining composition and age-related differences pertaining to these networks. The other line integrates attachment with social network analysis to investigate how individual differences in adult attachment are associated with the management and characteristics (e.g., density, multiplexity, and centrality) of people’s social networks. We show that most people’s attachment networks are small and hierarchical, with one figure being the primary attachment figure (often a mother or romantic partner, depending on age). Furthermore, attachment style predicts network characteristics and management, such that insecurity is associated with less closeness, multiplexity, centrality, and poorer management (less maintenance, more dissolution).

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Research into adult attachment and people’s network of acquaintances consists of two areas. The first line of work focuses on a specific type of social network — the network comprising of the people who fulfill one’s attachment needs for love, comfort, and security — termed an attachment network [1]. Over the last two decades, a number of studies have advanced our understanding of the composition and age-related differences pertaining to attachment networks [2–5]. The second line of research has emerged over recent years and integrates adult attachment with social network analysis to investigate how individual differences in adult attachment (i.e. attachment styles) are associated with the characteristics of people’s social networks (such as network density, multiplexity, centrality, and network management) in general. In this paper, we briefly review both lines of research and propose a novel model that integrates attachment network and social network research with individual differences in adult attachment.

Adult attachment
According to Bowlby [6], people’s behavior is guided by various behavioral systems. For example, a person’s tendency to seek close proximity to a primary caregiver when threatened or distressed is driven by the attachment behavioral system. Behavioral systems organize and direct behaviors to attain set goals. The set goal of the attachment system is to achieve security — a state of psychological and physical safety necessary for optimal human functioning. Thus, the attachment system promotes survival in children by mobilizing them to seek proximity to a dependable other who can provide support, comfort, and protection (termed an attachment figure). Once established, this relationship with the attachment figure serves three main functions: proximity maintenance, which refers to the person seeking and remaining in close contact with the attachment figure; safe haven, turning to attachment figures for comfort and safety in times of need; and secure base, using attachment figures as a base from which to engage in exploration and other non-attachment behaviors.

Repeated interactions with attachment figures result in the development of a person’s attachment style — a chronically accessible way of thinking, feeling and acting in close relationships [7^]. Attachment style has been found to be associated with multiple relational variables including the way people perceive and manage their social relationships with close others [8,9]. It is therefore also possible that attachment style may be associated with the way that people configure and manage their attachment networks and general acquaintances networks as a part of their social networks. In the sections that follow, we provide an overview of the associations between attachment and these two types of networks.

Attachment networks in adulthood
Many of the studies on attachment networks [2–5] have tested Bowlby’s [6] idea of monotropy — a tendency to prefer one attachment figure to meet attachment needs over others. In much of this work, which was conducted over a decade ago, researchers have used either the Attachment Network Questionnaire (ANQ) [5] or the WHOTO [3] to generate the list of close others who fulfill people’s different attachment functions. The ANQ also identifies a hierarchy of attachment figures from the most preferred or relied upon, to the least. Thus, a person who reportedly fulfills more attachment functions is
ranked higher in the hierarchy. The individual who fulfills the most functions is deemed the primary attachment figure.

Research into the rank-ordering of members within the attachment networks of adults suggests that relationship status is an important moderator variable. In studies spanning the adult lifespan, people in romantic relationships were found to rate their partner as their primary attachment figure [2,5,10,11]. This is followed by mothers and/or a best friend with siblings and fathers relegated to lower positions within the attachment hierarchy. Among un-partnered people, mothers and best friends are more likely to be primary attachment figures. Similar results have been found across non-Western cultures [12]. More recent research suggests that attachment networks of individuals may be less hierarchical than described above. Despite a number of studies identifying that most people (over 90%) have a primary attachment figure, Freeman and Simons [13] suggest that approximately a third of adults (mainly individuals with an insecure attachment style) report a non-hierarchical attachment network structure (such that no specific attachment figure is preferred in meeting attachment functions).

Some of these same studies have also focused on identifying which members of a person’s attachment network are more likely to fulfill each attachment function and whether these roles are transferred from one attachment figure to another as a result of life events and stages [2,3]. In general, primary attachment figures are often sought for all attachment functions [5]. However, when examining each attachment function individually, best friends and romantic partners are most commonly nominated to meet proximity maintenance and safe haven functions, whereas parents and partners are often nominated to meet the function of secure base—a finding consistent across samples of both healthy adults and those experiencing a chronic illness [3,4,14].

Experiments examining attachment networks during different ages, life stages, and events suggest that primary caregivers (usually parents) fulfill most functions early in life and peers (best friends) increasingly fulfill them during adolescence. In adulthood, the functions are fulfilled by romantic partners, who often assume the role of the primary attachment figure during this period. Among older adults, adult children are often nominated to fulfill attachment functions [2]. In the case of single adults, best friends or family members are called upon to fulfill these functions [15].

Studies regarding the size of attachment networks show that the majority of individuals have attachment networks consisting of approximately five attachment figures [5]. This number is similar to findings by Antonucci and colleagues who state that most young and middle-aged adults report around four network members to be their most inner circle and the closest to them [16]. Related, Dunbar and colleagues [17,18] propose a layered model of the social network in which the innermost layer includes 3–5 people who can be most relied upon, and in attachment terms, are likely to be attachment figures. However, research by Rowe and Carnelley [19] into the associations between attachment style and the size of attachment networks has revealed that securely attached individuals include significantly more figures (N = 7.76) within their attachment networks than insecurely attached individuals (N = 1.75). Furthermore, these authors found that securely attached individuals also mapped attachment network members as closer to the self-compared to insecurely individuals. These findings are interesting as they suggest that attachment insecurity may disrupt the normative building of one’s attachment network as well as the feelings of closeness that one may experience with attachment network members.

The findings regarding attachment networks suggest that these networks generally comprise anywhere between five to seven attachment figures, and that there exists some evidence to support Bowlby’s idea of monotropy. Furthermore, across the lifespan, the fulfillment of attachment functions seems to transfer from parents to romantic partners and peers, and then to adult children.³

**Adult attachment and social networks**
Over 40 years had passed since Henderson [20] suggested using attachment theory as a way to understand the psychological function of people’s broad social networks. Despite this, relatively little empirical work has followed-up Henderson’s initial idea [21]. Recently, researchers have applied attachment theory (by way of individual differences in adult attachment) to study various social network characteristics [22**,23**,24,25]. These network characteristics have comprised a person’s own (i.e. the ego in network terms) perceptions of: (1) the closeness between each network member (network density), (2) their popularity among network members (network centrality), and (3) the extent that network members fulfill various roles and functions for the ego (network multiplexity). These functions include (beyond attachment functions) turning to others for affiliation, emotional, instrumental or informational support, and seeking enjoyment and pleasure [26]. In addition, some of these studies have investigated the associations between attachment style and the management of one’s social network. In the subsections below, we outline this emerging literature.

**Attachment style and network characteristics.** Across a series of three studies, Gillath and colleagues [22**] examined the association between attachment style and the friendship networks of young adults with an emphasis on network density and multiplexity. Data was collected from two samples—one focusing

³ Assuming one has a romantic partner and children [14].
specifically on online friends and the other focusing on face-to-face friends. Attachment anxiety was found to be associated with perceived network density, such that the higher one's anxiety the lower the perceived density. Attachment avoidance was not associated with network density in any consistent way; however, it was associated with multiplexity. The higher one's attachment avoidance, the lower the multiplexity.

Lee and Gillath [23**] collected data once a week across 10 weeks on college students' closeness to their social network members. They found that attachment avoidance negatively predicted closeness to social network members. This closeness to network members showed individual variation in its stability (operationalized as the average standard deviation of closeness to network members across 10 weeks), and attachment security (low scores on avoidance and anxiety) positively predicted the stability of closeness. The researchers also assessed multiplexity, and found that attachment avoidance negatively predicted multiplexity in the social network. Webster and colleagues [25] surveyed college students and their classroom-based social networks. They found that avoidant attachment was negatively associated with network centrality (the number of times the ego was nominated as a friend by his or her peers). In other words, attachment avoidance predicted lower popularity among classmates.

The negative associations between attachment avoidance and closeness, multiplexity, and centrality fit with avoidant people’s tendency to distance themselves from others and their lack of confidence and thus desire to depend on others to meet their needs [19,27]. The lower closeness and popularity (assessed via centrality) reflects avoidant individuals' general discomfort with intimacy. The low multiplexity indicates that avoidant individuals may restrict each network member to fulfill just one or a limited number of functions, and in doing so, reduce dependence on each specific member, making each member more disposable [22**]. The negative association between attachment anxiety and network density may be due to network members feeling smothered by, and pulling away from, anxiously attached people [28]. Another explanation is that anxious people’s high need for reassurance leads them to underestimate closeness in their network [29].

**Attachment style and network management.** Gillath and colleagues [22**,23**,24] also investigated the associations between attachment style and network management by assessing the extent to which people initiate, maintain, and dissolve their social ties. They found that attachment avoidance was negatively associated with the maintenance of social ties and positively associated with the dissolution of social ties. This pattern of results is consistent with avoidant individuals’ overall tendencies to avoid intimacy and closeness [7*]. The findings for attachment anxiety, however, were less consistent. Gillath et al. [22**] report attachment anxiety to be positively associated with tie initiation and dissolution, whereas Gillath et al. [24] report attachment anxiety to be negatively associated with tie maintenance when moderated by attachment avoidance, such that individuals low on attachment anxiety and avoidance (i.e. securely attached) reported a greater tendency to maintain ties.

**Implications and conclusion**

In this paper, we reviewed research into adult attachment and two types of networks — attachment networks and broader social networks. As outlined in this paper, research into these two types of networks reflects parallel lines of work. We close this review by proposing an integrative model that brings together these two streams of research. As illustrated in Figure 1, we consider the attachment network to reflect a specific subset of the relational ties that reside within one’s broader network — what Antonacci and colleagues [30] refer to as the network of ‘very close’ acquaintances or what Dunbar and colleagues [18] term the ‘support clique’. From this perspective, it may be somewhat limiting to study attachment networks devoid of the context of a person’s larger social networks and the properties that define a network’s characteristics. We make this point for three reasons. First, considering one’s broader social network provides researchers the opportunity to map out whether and how network members (who are not attachment figures) may fulfill attachment functions (directly or indirectly), become new members of one’s attachment network, and the role that the broader network plays in the reconfiguration of people’s very close others over time. Second, if the attachment network represents a subset of the broader social network, then the network characteristics that apply to social networks should apply to the way individuals characterize their attachment network. From this perspective, investigating the network characteristics (i.e., density, centrality, and multiplexity) of the attachment network may yield new and important insights into the nature and properties of this highly specific and important network. Third, taking the same perspective also suggests that the findings related to attachment style and coping strategies may also apply to members of the broader social network.

In our model, we suggest that the characteristics of people’s broad networks are likely to be influenced by a person’s attachment style, with attachment security enhancing the sense of closeness (density) and extent to which network members are called upon to meet attachment and non-attachment functions (multiplexity). In contrast, attachment insecurity is likely to weaken network density and multiplexity. Moreover, emerging research suggests that the associations between attachment style and network characteristics may not only be direct in nature, but indirect, through people’s
A conceptual depiction of the associations between attachment style, network management skills and network characteristics. Within this figure, the attachment network is conceptualized as a nested subcomponent of the broader social network. From this perspective, the network characteristics that apply to social networks should apply to the way individuals characterize their attachment networks. Likewise, network management skills not only apply to the broader social network, but also to the attachment network.

management of their social ties. Thus, Figure 1 suggests a complex and dynamic interplay between attachment style, network management skills, and the characteristics of people’s social networks in general and in their attachment networks specifically.

Aside from a notable few studies [31,32], much of the close relationships research into social networks has been conducted devoid of a social network analysis framework [33]. Likewise, many social networks scholars conduct studies on relationships devoid of theories of relationships. Our proposed model provides a conceptualization that can aid in generating future research that bridges the gap between these two complementary and related lines of research. Our model suggests that future research should aim to first, attain information on people’s broader social network in addition to the attachment network, second, use social network analysis when studying the attachment network, and third, integrate findings regarding attachment style, network management skills, and network characteristics to depict a comprehensive picture of attachment and social functioning.

Conflict of interest statement
Nothing declared.

References and recommended reading
Papers of particular interest, published within the period of review, have been highlighted as:

- of special interest
- of outstanding interest


This paper reports on the only study to date that looked at attachment style and network characteristics longitudinally. Three indexes of closeness (mean level, trajectory, and fluctuations) are employed to investigate how attachment style predicts closeness in one’s social network over time. This paper exemplifies the use of multiple indexes to test hypotheses and highlights the importance of assessing change in networks and their characteristics.


