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Network Brokerage: An Integrative Review and Future Research Agenda

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Network brokerage research has grown rapidly in recent decades, spanning the boundaries of multiple social science disciplines as well as diverse research areas within management. Accordingly, we take stock of the literature on network brokerage and provide guidance on ways to move this burgeoning research area forward. We provide a comprehensive review of this literature, including crucial dimensions of the concept itself in terms of brokerage structure and behavior, a set of key categories of factors surrounding the brokerage concept (antecedents, outcomes, and moderators), and an overview of brokerage dynamics over time. We use these dimensions and categories to depict network brokerage's theoretical and empirical underpinnings as well as evaluate prior research efforts. In so doing, we offer a means to summarize and synthesize this large, interdisciplinary literature, identify important research gaps, and offer promising directions for future research.

Keywords: *social networks; social exchanges; social capital; brokerage; ties; network*

Supplemental material for this article - including a methodological description of the article-selection process and details of each study in our sample - is available with the manuscript on the JOM *website.*

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A key challenge in management is trying to understand, construct, and make use of the set of relationships among individuals, groups, and/or organizations—social networks. In studying these networks, one of the most important concepts to emerge has been brokerage. Network brokerage ("brokerage" for short) describes an activity of a network actor (broker) occupying a structural position (bridge, structural hole) between two or more otherwise disconnected actors (hereafter referred to as "alters"), and it typically involves an exchange or interaction between the broker and the alters. Brokers are often conceptualized as entrepreneurs leveraging their position in a network structure to achieve their private (Burt, 2005) or the collective's (Clement, Shipilov, & Galunic, 2018) goals.

The core intuition behind the brokerage concept has been credited to Simmel's (1950) classic discussion of third-party influence and Granovetter's (1973) seminal article on weak ties and "forbidden triads," although neither Simmel nor Granovetter used the term "brokerage." Eventually, social scientists converged on the use of the term "brokerage" to describe these ideas (Burt, 1992). The brokerage concept builds on network arguments such as betweenness centrality (Freeman, 1977), benefits of having exclusive exchange partners (Cook & Emerson, 1978), and competitive advantage and structural autonomy created by structural holes in networks (Burt, 1980). Since the idea of brokerage can be a lens to study numerous social phenomena, brokerage research has spanned across multiple social science disciplines as well as diverse research areas *within* management.

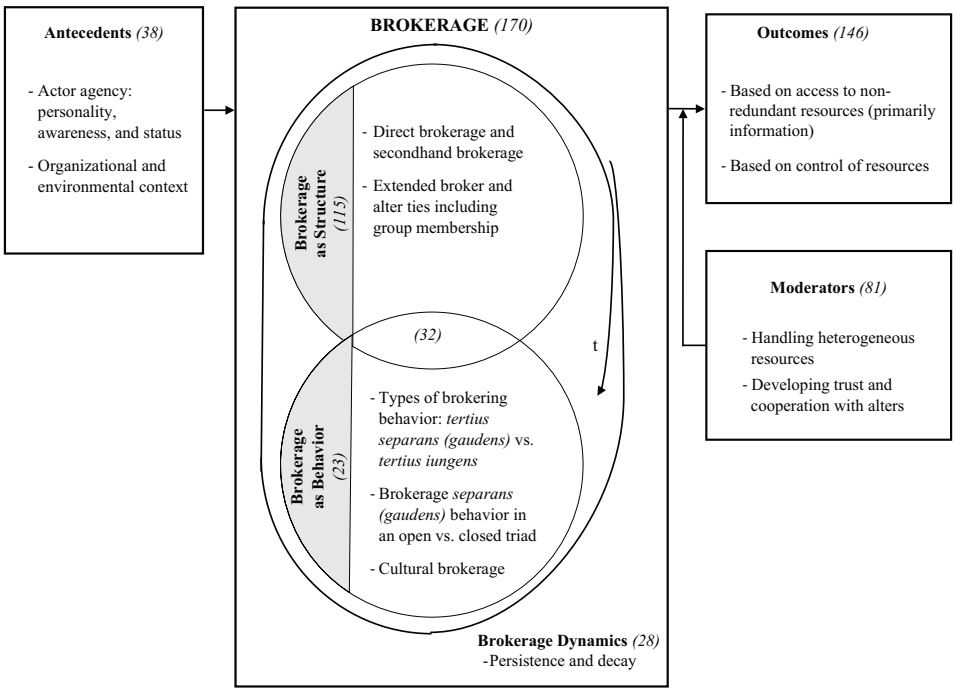
The past decade has seen a dramatic increase in the number of studies investigating brokerage, resulting in a rather splintered, fragmented understanding of the concept. Often departing from its seminal conceptualization, research on brokerage has expanded in multiple directions, leading to mixed or confusing findings and showing that its benefits are contingent on many factors. The need for conceptual clarification is especially urgent, as the field has become inundated with brokerage research without a clear understanding of how the splintered studies relate to or build on each other.

In an effort to address this challenge and make sense of this burgeoning literature, we reviewed 170 studies. While there were a number of previous reviews of social networks that, in part, address brokerage (Burt, 2005; Carpenter, Li, & Jiang, 2012; Tasselli, Kilduff, & Menges, 2015) or specific networks (Phelps, Heidl, & Wadhwa, 2012), a focused review on brokerage has been rather sparse (however, see Stovel and Shaw (2012) for a review of the sociology literature on brokerage and Halevy, Halali, and Zlatev (2019) for a review of third-party influence as applied to brokerage). Our goals are (a) to develop a comprehensive theoretical framework that organizes the brokerage literature, (b) to use our framework to review extant research within and across multiple research areas, and (c) building on this review, to highlight the theoretical and empirical gaps that continue to plague the brokerage literature and suggest several future research directions for advancing the state of brokerage research. In doing so, our primary focus is on conceptual synthesis, not on individual studies or on purely methodological or technical contributions.

Scope and Method of the Review[1]

To manage the scope of our review and ensure coverage of relevant studies in our sample, we searched the ISI Web of Knowledge database for academic publications containing in articles' title, abstract, or keywords the term "broker" or other related terms (such as "structural hole," "boundary spanning," "betweenness," "bridging," "tertius iungens,"

Figure 1
An Integrative Framework for Network Brokerage



Note. The number of articles in each category is in parentheses. The *t* notation in the center refers to changes over time, that is, brokerage dynamics.

"tertius gaudens," "triad," or "referral") combined with "network." We then refined the search to 58 top- and middle-tier journals in management or related fields as well as the top specialty journal in this domain, *Social Networks.* Each of the remaining articles was then analyzed according to six exclusion criteria, eliminating articles that (a) did not specifically and explicitly focus on brokerage; (b) considered networks as a collection of dyads, thereby neglecting the role of third party; (c) considered brokerage as an occupation rather than network intermediary; (d) focused exclusively on methodological and measurement issues; (e) focused on nonhuman social networks or relied on computer simulations; or (f) dealt with networks outside a work or professional context. Ultimately, this process led to a final population of 170 articles.

A Framework for Understanding Network Brokerage

To ease the review of the diverse body of work on brokerage, we developed a framework (see Figure 1). This comprehensive framework categorizes recent brokerage research into five broad areas: (a) antecedents, the factors that lead actors to undertake brokerage; (b) the dimensions of brokerage concepts (structure and behavior); (c) brokerage outcomes; (d) moderators, factors that moderate brokerage performance; and (e) brokerage dynamics over

time. Next, we present our full review of this literature, using this framework. Because our review identifies two primary conceptualizations of brokerage—structure and behavior—we begin with brokerage structure, followed by brokerage behavior, and then considers antecedents, outcomes, and moderators of brokerage as well as brokerage dynamics over time.

Brokerage as Structure

Structural conceptualizations of brokerage have dominated the literature. Brokerage occurs when one actor (the broker) is connected to two other actors (alters) who are not themselves connected. This brokerage structure is variously called a structural hole, an open triad, an open structure, a lack of closure, a lack of network constraint, a brokerage tie, or a bridge.[2] Although Granovetter's (1973) seminal paper focused on tie strength, his theoretical rationale was structural: He argued that network bridges are a direct consequence of weak ties, because strong ties between a focal actor ("ego") and alters are likely to produce closure (where all the parties are connected) through the process of transitivity, or a desire for balance. Open triads (where actor A has a tie to B and to C, but there is no tie between B and C) with strong ties are rare and famously labeled "forbidden" by Granovetter (1973). Burt further refined this idea by arguing that "tie weakness is a correlate, not a cause" (Burt, 1992: 27) and thus shifting the causal emphasis from the weakness of a tie to the structural hole it spans.

Most of the research we reviewed focuses on a broker's direct ties to alters ("direct brokerage"), ignoring the broader network beyond these alters. However, an emerging stream looks at the extent to which a focal broker's alters are also bridging structural holes ("secondhand brokerage"), that is, on whether the alters themselves have open or closed networks. The potential advantage of secondhand brokerage is that alters who broker other relationships acquire additional diverse information that can potentially be passed along to the focal broker (McDermott, Corredoira, & Kruse, 2009). Thus, the theoretical mechanisms explaining potential benefits from secondhand brokerage mirror those for direct brokerage (see Outcomes section); namely, the spillover benefits come from the alter's brokerage benefits of nonredundant resources and control, contingent on the alter's willingness to share with ego, the focal broker. Just as cooperation and trust can enhance the benefits of direct brokerage (Levin, Walter, Appleyard, & Cross, 2016), they may also enhance secondhand brokerage: In a cooperative situation, both brokers may benefit; in a competitive context, both brokers may suffer as each tries to take advantage of the other.

Empirical support for secondhand brokerage has largely tracked this idea that (a) secondhand structure in general does not necessarily confer any benefits, but (b) special configurations of secondhand brokerage that provide both novelty *and* cooperation do provide benefits. To the first point, in two studies and across several samples, Burt (2007, 2015) found no additional secondhand benefits for the focal broker beyond those explained by direct brokerage. However, to the second point, other studies have found performance benefits of secondhand brokerage if the focal actor's alters are brokers who can provide a needed benefit of novelty and cooperation (Clement et al., 2018; Galunic, Ertug, & Gargiulo, 2012). These cases suggest that the benefits of secondhand brokerage are contingent; that is, secondhand brokerage is helpful only under circumstances when it combines information diversity with trust and cooperation. Interestingly, another study actually found performance benefits for

secondhand closure—where one's alters have networks that are closed, not open like with secondhand brokerage—yet these seemingly opposite findings actually followed a similar logic: The benefits for ego were contingent on structural configurations where the alters had both a novelty benefit to offer as well as an incentive to cooperate (Shah, Levin, & Cross, 2018).

A second, related emerging stream formally extends the structural analysis to include the group membership of the broker and alters within the overall configuration of the extended network. For example, Fernandez and Gould (1994) identified five different broker types, with expected brokerage activity, depending on the configurations of group members among the actors in a network: A broker can be a *coordinator*, enhancing interaction between the members of the group the broker belongs to; a *gatekeeper*, absorbing knowledge from another group and passing it to the other members of the broker's group; a *representative*, when the broker diffuses the knowledge of the broker's own group to another group; an *itinerant broker*, if the broker mediates between members of a group the broker does not belong to; or a *liaison*, if the broker mediates between members of different groups (cf. Boari & Riboldazzi, 2014).

While the Fernandez and Gould (1994) typology considers brokers as a member of a single group only, Krackhardt (1999) points out that brokers may have multiple group memberships. He proposes that "Simmelian brokerage" can occur when the broker is a member of two densely connected cliques (everyone, including the broker, is reciprocally tied to everyone else in the clique) and, at the same time, the only link between the cliques. Being a member of a densely connected, closed group can be constraining, and being the only link between two such groups can produce "ties that torture" as the broker faces dual constraints. Unlike the broker in the Fernandez and Gould (1994) typology, who enjoys autonomy and discretion, Simmelian brokers feel highly monitored and constrained.

Brokerage as Behavior

While the opportunities afforded by the structure of network ties are necessary for brokerage to occur, these structural opportunities by themselves do not necessarily trigger brokering behavior (Smith, 2005), as "networks do not act but are context for action" (Burt, 2004: 354). Acting on these brokerage opportunities requires "the intellectual and emotional skills developed in the process of encoding and decoding information to communicate between diverse contacts" (Burt, Kilduff, & Tasselli, 2013: 536). Thus, research is increasingly devoting attention toward brokerage behavior (Boari & Riboldazzi, 2014; Quintane & Carnabuci, 2016), or *brokering*, that is, the actions and network processes related to brokerage. This conceptualization of brokerage examines what brokers actually do (Batjargal, 2010), including the strategic actions of "network architects" (Pollock, Porac, & Wade, 2004: 50). Although our review revealed far fewer studies of brokerage behavior, we see this area as a welcome development that has the potential to uncover and confirm the theoretical mechanisms often assumed to accrue automatically to occupants of brokerage positions in a network.

Our review identified two broad categories of brokerage behavior, focusing on how a broker either maintains the separation between alters in open triads or transforms open into closed triads. We refer to the former category as *tertius separans* (the third who separates) and the latter as *tertius iungens* (the third who joins). Note that tertius separans behavior is

usually referred to as *tertius gaudens* (the third who benefits), but we agree with Burt (in press) that tertius separans is a more appropriate label as brokers can benefit from both joining and separating alters. When brokers behave as tertius separans—also called disjunct (Grosser, Obstfeld, Labianca, & Borgatti, 2019) or arbitraging (Soda, Tortoriello, & Iorio, 2018) as well as tertius gaudens (Obstfeld, 2005)—they keep the alters unconnected. According to Spiro and colleagues (2013), brokers can engage in this tertius separans behavior through two types of brokerage processes: transfer and coordination. In transfer brokerage, the broker controls the "flow" from one side of the network to the other, without attempting to link the alters directly (Obstfeld, Borgatti, & Davis, 2014). For example, a broker can learn how to use a technology from one alter and deliver that knowledge to another alter that does not have it (Hargadon, 2002). In coordination brokerage, a broker mediates between the alters so that the need of any alter-alter contact does not arise. For example, Fernandez and Gould (1994) point to the role of the Federal Reserve Bank in a major city: Transactions among many smaller banks are frequently conducted through the central bank rather than directly, since it serves as a kind of clearinghouse for all the banks in its area.

In contrast, when brokers behave as tertius iungens (the third who joins)—also called catalyst (Stovel, Golub, & Milgrom, 2011) or collaborating (Soda et al., 2018) brokerage—they try to introduce or facilitate ties between previously unconnected alters (Obstfeld, 2005), engaging in matchmaking (Ebbers, 2014). When a broker introduces or facilitates such ties between alters, this iungens behavior can either decrease in importance over time (brief iungens) or stay essential (sustained iungens) (Obstfeld, 2005).

Although the literature has generally suggested that tertius separans and iungens are actor specific and thus intrinsic to each broker, some argue that these two brokerage behaviors can be used by the same broker depending on the task (e.g., Lingo & O'Mahony, 2010). For example, Baker and Obstfeld (1999) argue that tertius separans behavior (keeping alters apart) works better in a competitive market with sparse networks, whereas tertius iungens behavior (bringing alters together) is more effective in a cooperative context with dense networks. Whereas tertius separans allows access to novel information, tertius iungens is helpful for integrating diverse ideas and implementing new ideas (Lingo & O'Mahony, 2010).

Whereas the brokering behaviors just reviewed occur in an open triad, we see different sets of behaviors manifested in a closed triad. When all actors are connected in closed triads, the positional advantages of a broker largely disappear, and one could argue that *any* behavior directed toward others in the closed triad might be considered brokerage, making the concept incomparable to brokerage behaviors in an open triad and more akin to third-party influence than brokerage (Burt, in press). Of course, this does not mean that all ties within closed triads are equally activated, as actors rarely if ever transact everything with everyone. So a tertius iungens approach, for example, might still provide value even if all three parties know each other (e.g., "I mentioned to our coworker Jane that you're doing a sales call next week at Company X, and it turns out she used to work there and still knows a lot of people; you should talk with her."). Thus, even in a closed triad, there may be opportunities for brokerage behavior and third-party influence, that is, situations where one actor has the time, ability, or motivation to learn more about the other two than they know (or care to know) about each other.

Halevy, Halali, and Zlatev (2019) provide a review of brokerage-type behavior in closed triads, focusing on actor interdependence and third-party influence. Applying interdependence theory (e.g., Kelley & Thibaut, 1978), they develop a "changing others' relationships" (COR) framework based on the premise that "brokering activities target others' relationships"

(p. 219). They further offer a longitudinal perspective on pre- and postintervention influence that results in either helpful or harmful brokers. Their study provides insights on third parties creating, reinforcing, changing, and terminating relationships, suggesting other forms of brokerage behavior (e.g., social introductions, gossip, conflict management) in addition to the previously researched tertius behaviors.

Finally, an emerging stream of brokerage behaviors focuses on cultural brokerage. Emphasizing the role of context, Pachucki and Breiger (2010) argue that a broker crosses boundaries not just between social circles (i.e., across structural holes in a network), but also across different cultural communities ("cultural holes"). Actors bridging across a structural hole have access to diverse information, but the information they access may be hard to interpret and absorb (Aral & Van Alstyne, 2011). A cultural broker with the ability to interpret information and translate to others can bridge these cognitive gaps (Carlile, 2004) or "thought worlds" (Dougherty, 1992). For example, van Wijk, Stam, Elfring, Zietsma, and den Hond (2013) found that whereas network brokers establish connections across different parts of a network, cultural brokers connect ideas across discourses so that they will be more readily accepted by others. Cultural brokers either transform and combine diverse cultural knowledge into new solutions (Hargadon & Sutton, 1997) or translate and make more complex knowledge meaningful (Boari & Riboldazzi, 2014).

Antecedents of Brokerage

Our review of brokerage antecedents revealed a focus on actor agency and on environmental/contextual factors beyond the control of actors. From the agency approach, Burt (2012) noted that individuals who occupy a network broker position in one role will tend to occupy a similar position in other roles. What explains this consistency for individuals? One answer is the personality variable of self-monitoring, the "active construction of public selves to achieve social ends" (Gangestad & Snyder, 2000: 546). High self-monitors—who aim to make a good impression and fit in, chameleon-like, in different situations rather than stay consistent across situations—tend to occupy broker positions in the network structure (Sasovova, Mehra, Borgatti, & Schippers, 2010). The effect of self-monitoring on brokerage is amplified in individuals perceived as highly empathic (Kleinbaum, Jordan, & Audia, 2015) and with longer tenure in the organization (Mehra, Kilduff, & Brass, 2001). Other personality variables have been explored (e.g., Kalish & Robins, 2006), but a meta-analysis found that personality had a fairly small impact on being a broker (Fang, Landis, Zhang, Anderson, Shaw, & Kilduff, 2015).

Variation in actors' awareness of network ties is another antecedent of brokerage. People seem to be poor at seeing structural holes, as most people tend to see ties in their network where holes exist (Freeman, 1992). To the extent that people can be trained to recognize structural holes (Janicik & Larrick, 2005) and taught to network more strategically (Burt & Ronchi, 2007), this cognitive ability might be a strong predictor of brokerage behaviors.

Other studies have suggested that status differences can influence whether actors can create and occupy structural holes. High-status brokers attract disconnected alters because the brokers are prominent in the overall network and have selection power over whom to associate with (Sauder, Lynn, & Podolny, 2012). Moreover, feeling powerful increases one's willingness to broker, though it reduces brokerage opportunity recognition at the same time (Landis, Kilduff, Menges, & Kilduff, 2018). However, at the organizational level, Chandler,

Haunschild, Rhee, and Beckman (2013) found a negative link between status and brokerage for firms.

Aside from actor agency, the organizational context also matters for brokerage creation. Thus, actors are more likely to become brokers when exposed to heterogeneous events or organizational affiliations (Stam, 2010) or at firms that encourage employees to move between teams and projects (Hargadon & Sutton, 1997). The organizational contexts like these provide opportunities for those employees to bridge otherwise disconnected groups (Kleinbaum, 2012).

More broadly, as the external environment surrounding individuals and organizations becomes more complex, individuals and organizations have to rely more on brokers to access external knowledge to overcome internal technical and cognitive limitations (Kirkels & Duysters, 2010). In an environment where information is poorly distributed (as when markets or hierarchies are incompletely developed, in emerging fields, or in countries with weak and inefficient formal institutions), opportunities for brokerage emerge (Batjargal, Hitt, Tsui, Arregle, Webb, & Miller, 2013). National culture can be another environmental antecedent. Burt, Hogarth, and Michaud (2000) found that, compared to American managers, French managers associate negative emotions with brokerage and thus have fewer brokerage ties.

Outcomes of Brokerage

Whether the focus is structural or behavioral, the interest in brokerage and its importance rests on the outcomes. In our review of the literature, we noted two conceptual arguments underpinning the benefits of brokerage: access to nonredundant resources (primarily information) and control of resources. Although both are typically included as theoretical mechanisms explaining brokerage outcomes, we argue that they are analytically distinct. On the one hand, building on Granovetter's (1973) notion of the strength of weak ties, we note that actors in brokerage positions are exposed to more novelty, that is, to a greater variety of nonoverlapping knowledge flows and nonredundant information by being tied to disconnected alters. As a result, brokers may recognize entrepreneurial opportunities, creatively synthesize diverse information, and obtain a better, more timely vision of future possibilities (Burt, 2005). On the other hand, building on Simmel's (1950) notion of tertius separans (gaudens), Merton's (1957) ideas of the autonomy generated by conflicting affiliations, and traditional economic ideas of monopoly power and oligopoly, we note that brokers can also control the information (or other resources) flowing between disconnected alters. Brokers can match alters across the two sides of a market (whether it be economic, informational, or other social resources), providing value to market participants (Bidwell & Fernandez-Mateo, 2010) and also capturing some of the value created for others (Marsden, 1982). Or, they can play alters off against each other to achieve optimal outcomes for themselves (e.g., negotiating with two venders). The tertius separans strategy of playing one alter off against another, such as in mutually exclusive exchange partners (Cook & Emerson, 1978), requires that the resources provided by the alters are redundant. While these two mechanisms, access to nonredundant resources and control of resources, are analytically distinct, we also note that the two theoretical mechanisms are not mutually exclusive, and both provide explanations for brokerage advantage and theoretical motivation for almost all the research we reviewed.

Economic returns of nonredundant resources for the broker are well documented (see Burt, 2005, for an extensive review). Our review finds that access to nonredundant information theoretically links brokerage to beneficial economic outcomes for the broker, largely overlooking the risks, or highlights negative economic outcomes for alters. In comparison to nonbrokers, brokers generate more resources (Aral & Van Alstyne, 2011), profit more (Burt, 1983), receive more favorable individual performance evaluations (Burt, 2004), experience greater rates of career advancement (Brass, 1984), and receive greater compensation (Burt, 1997). Additionally, bridging ties may produce career benefits over an extended time period (McEvily, Jaffee, & Tortoriello, 2012). Similarly, organizations with extensive brokerage ties have faster revenue growth (Batjargal et al., 2013), larger market share (Baum, McEvily, & Rowley, 2012), higher profitability (Bae & Gargiulo, 2004), and more value creation and capture (Afuah, 2013); better differentiate themselves from competitors (McEvily & Zaheer, 1999); close more deals (Mizruchi & Stearns, 2001); and more easily obtain the necessary resources for successful performance, especially during early growth (Hite & Hesterly, 2001). In short, brokers of nonredundant resources tend to do well economically with only a few exceptions (e.g., Shipilov & Li, 2008).

While broker outcomes are largely positive, outcomes for alters are more mixed. Some evidence suggests that alters do benefit from brokerage (Borgatti, Mehra, Brass, & Labianca, 2009). For example, when job seekers use intermediaries to whom both the job seekers and the employers are tied, they are more likely to get hired (Granovetter, 1974) at a better job (Bian, 1997) and to be more productive (Castilla, 2005). However, other research suggests that brokers extract economic rents from the brokered alters (Fernandez-Mateo, 2007). Thus, a group's performance may suffer if it has many individuals, or a leader, occupying brokerage positions, as brokers often seek individual benefits to the detriment of group benefits (Bizzi, 2013). Perhaps as a result, when everyone in a network tries to be a broker, no one can maintain a structural advantage in the long run (Buskens & van de Rijt, 2008).

In addition to economic outcomes, access to nonredundant information theoretically links brokerage to beneficial knowledge outcomes. Employees who are brokers within their organization generate more good ideas (Burt, 2004), pursue more exploratory searches in the collaboration network (C. L. Wang, Rodan, Fruin, & Xu, 2014), and demonstrate higher creativity (Li, Li, Guo, Li, & Harris, 2018), as brokers have greater and/or earlier access to nonredundant useful knowledge (Fleming, King, & Juda, 2007), including potentially disruptive innovation (Sapsed, Grantham, & DeFillippi, 2007). Similarly, in the case of patents, inventors who span structural holes in an intraorganizational knowledge network are more likely to be cited by other inventors (Nerkar & Paruchuri, 2005). At the organizational level, broker firms get more information (Lee, 2007), learn about novel information earlier, and produce greater innovative output (Hargadon & Sutton, 1997) than non-brokering firms. Additionally, when dominant broker firms are committed to open dissemination of information, innovation benefits accrue not just to the specific parties directly connected to the broker firms but also to any members in the network (Owen-Smith & Powell, 2004). Similarly, community organizations can broker ties among isolated groups in a community so that the community becomes less polarized and more entrepreneurial (Kwon, Heflin, & Ruef, 2013). However, research has also dealt with some knowledge disadvantages. For example, Ahuja (2000) found that the more a firm spanned structural holes, the fewer the firm's subsequent patents, as brokerage undermines interfirm trust. Fleming, Mingo, and Chen (2007) found that collaborative brokerage resulted in new patents but hampered their diffusion.

In addition to brokerage benefits based on access to nonredundant resources (primarily information), researchers have looked at brokerage benefits based on control of resources. For some, control of resources provides the theoretical link between brokerage and power (Brass, 1984). Because brokers control information flows among a large and diverse set of actors, they are perceived as more influential (Shipilov & Li, 2008) and exert this influence over other actors (Padgett & Ansell, 1993). Thus, carried to the extreme, brokerage can undermine the cooperation and feelings of trust and goodwill (McEvily & Zaheer, 1999). Indeed, the Achilles' heel of a brokerage structure is that it does not inherently encourage—and sometimes even discourages—a willingness to cooperate. In contrast, closure, often seen as the opposite of brokerage, is typically associated with cooperation and trust (Coleman, 1988).

Moderators of Brokerage

As Burt (2010: 195) notes, "Network brokerage is a craft more than a commodity so benefits typically vary widely between people." Our review of the brokerage literature revealed a large set of seemingly unrelated moderators of the brokerage–outcomes relationship. However, when considering the conceptual rationale for each moderator, we discovered two underlying themes. Specifically, brokerage is more successful when (a) heterogeneous resources that result from bridging different social circles are effectively handled and (b) trust develops between the broker and alters.

Researchers have identified a number of moderators at multiple levels that facilitate handling heterogeneous, asymmetric, and complex resources. At the broker level, brokerage becomes more beneficial when a broker has the skills to mobilize political support through negotiations, compromises, and horse trading, as brokering heterogeneous information across differing perspectives, opinions, or values typically involves both social and political skills (Grosser et al., 2018). This has been studied empirically in such diverse settings as HIV/AIDS treatment advocacy (Maguire, Hardy, & Lawrence, 2004), new entrepreneurial firms (Fang, Chi, Chen, & Baron, 2015), and the Nashville, Tennessee, country music industry (Lingo & O'Mahony, 2010).

At the task level, researchers have looked at the effects of knowledge heterogeneity, asymmetry, and complexity on brokerage outcomes. While some studies found that brokerage becomes increasingly important for tasks involving heterogeneous knowledge (Balachandran & Hernandez, 2018), other research finds the opposite results (Ter Wal, Alexy, Block, & Sandner, 2016), as brokers fail to absorb effectively the diverse and heterogeneous knowledge they access. Knowledge asymmetry between the broker and the alters can also be a moderator, as the broker may perform better when the alter holds more *inaccurate* knowledge of the structural hole and thus does not threaten to exit the brokerage tie (Hahl, Kacperczyk, & Davis, 2016). Others have studied the knowledge complexity of a task. From the perspective of a broker, complex knowledge is more challenging, not just to transmit but also to recombine into an existing knowledge base (Fleming, Mingo, et al., 2007).

Brokerage moderators that focus on an organization's ability to handle heterogeneous resources include organizational endowments (Shi, Sun, & Peng, 2012), institutional order (Batjargal et al., 2013), generalist versus specialist strategies (Shipilov, 2006), and absorptive capacity (Shipilov, 2009). Environmental turbulence, such as technological changes, can also play a moderating role. When the external environment changes only to a limited extent, firms

with many structural holes in their alliance network perform better, because these brokers are well positioned to create novel recombinations of knowledge to take advantage of these changes (Koka & Prescott, 2008). However, in the wake of a more radical environmental change, such broker firms are disadvantaged, as their alters may no longer "have the requisite information necessary for quick and effective strategic response" (Koka & Prescott, 2008: 639).

The second moderator theme—trust and cooperation between broker and alters—is evident when considering the moderating effect of the strength of brokerage ties (Vedres, 2017), an effect due not so much to increased interaction frequency or emotional closeness but to trust (Levin et al., 2016). In particular, strong ties are better bridges than weak ties under two conditions. First, when social resources (e.g., trust and cooperation) must be transferred through network bridges, strong bridges are more valuable. Thus, when considering open innovation communities (Fleming & Waguespack, 2007) or job referrals (Bian, 1997), strong ties mitigate an inherent lack of trust associated with brokerage positions. Second, the more the total amount of nonredundant information transmitted over the network, the more valuable strong ties are in providing access to novel information relative to weak ties (McFadyen, Semadeni, & Cannella, 2009).

Although closure is often seen as the opposite of brokerage, the two can be viewed as complementary forms of social capital (Adler & Kwon, 2002). Several streams of network studies support this view. Brokerage ties alone, although conducive to the generation of new ideas, might not be effective in implementation. The literature on "small world" networks, defined as clustered relationships connected via a few bridging ties, also suggests that dense internal ties combined with trusted bridging ties across clusters can be an effective enhancer of the value of brokerage (Fleming, King, et al., 2007). The literature on structural folding—the network feature of a cohesive group whose membership overlaps with that of another cohesive group—echoes a similar point (de Vaan, Stark, & Vedres, 2015). Because actors at the structural fold are insiders to multiple groups, they can create trust between groups by vouching within one group for the members of another and can thus hold groups in place until new kinds of creative combinations can emerge. All these studies suggest that brokerage is most productive where network closure within the group is high and many bridging ties exist beyond the group (Burt, 2005).

This focus on trust and cooperation extends to a broker's social identity, as well. Brokers typically work with a diverse set of actors, so they tend to have flexible social identities (Reagans & Zuckerman, 2008). Although brokers are sometimes sought out (Brass, 2009), they may not want to publicize their identities as "middlemen" because potential alters want to avoid the commissions, either monetary or influence, associated with brokerage ties (Burt, 1992). Brokers' power may also diminish if they are overtly identified with pursuing their own interests (Fernandez-Mateo, 2007). However, if a broker's identity as a broker is known only to the broker, then the broker is "free to engage in different behaviors in different groups, changing her colors as she moves from group to group" (Krackhardt, 1999: 207) and maintaining "cooperation and passivity on behalf of all alters" (Buskens & van de Rijt, 2008: 373). Alternatively, some brokers cultivate an identity as a neutral mediator (Fleming & Waguespack, 2007). Fernandez and Gould (1994) discuss the impartial third's capacity to mediate conflict and restore a group to a more harmonious state. Failure to maintain impartiality, though, can hurt the broker's reputation (Fleming & Waguespack, 2007). Research has yet to explore the possibility that brokers may want to publicize their connections and successful brokering in order to acquire more brokerage opportunities.

At the organizational level, the extent to which the interests among employees are convergent can be an important moderator of brokerage's impact. In organizations where networks are highly fragmented and an "us–them" mentality emerges, actors who bridge conflicting social worlds often face distrust and suspicion about their loyalties from alters on both sides of the divide (Krackhardt, 1999). Under such circumstance, brokerage hurts, rather than benefits, the broker (Barnes, Kalberg, Pan, & Leung, 2016). Rogan (2014) applies this insight to a multiplex triad—"triplets composed of actors playing different roles and interconnected by more than one kind of relationship" (Shipilov & Li, 2012: 472-473)—and finds that when a broker exits, the multiplex triad is more likely to dissolve if the triad's members are competitors and their interests diverge. Davis and Eisenhardt (2011) suggest that for brokerage to be truly collaborative in an interdependent and dynamic environment, such as the high-technology industry, there must be a governance process that is much more fluid and collaborative.

Organizational and national culture have been viewed as influencing trust in brokers, although the research findings are mixed. Goldberg, Srivastava, Manian, Monroe, and Potts, (2016) found that brokers are more likely to be successful in their organization if they culturally fit with their colleagues. They argue that such "assimilated brokers" enjoy the advantages of acceptance and trust within the organization as well as the informational benefits of brokerage. Focusing on national culture, Burt and colleagues found the consistent performance effect of brokerage across countries by replicating the positive brokerage effect among French (Burt et al., 2000) and Chinese (Burt & Burzynska, 2017) managers. On the other hand, D. Wang (2015), Batjargal (2010), and Xiao and Tsui (2007) found that some cultures can be more hostile and xenophobic to brokers than others when compared to countries with collaborative norms (Vasudeva, Zaheer, & Hernandez, 2013). If brokerage is more beneficial in certain national cultures, is a brokerage advantage transferable from one culture to another? Guler and Guillen's (2010) research suggests it is not, supporting the idea that a firm's brokerage advantage is context specific and difficult to transfer.

Brokerage Dynamics

Although the dominant structural approach to brokerage carries an underlying assumption of stability (where recurring interaction leads to structure), researchers have begun to view brokerage from a more dynamic, longitudinal perspective. These studies tend to build and/or test theories that look at the time-varying aspects of brokerage structure and behavior. Absent some exogenous shock, networks can change incrementally as actors join and leave, and in the case of brokerage, disconnections between alters can vanish (or appear). Can the broker advantage be maintained in the face of network change? We found a few brokerage articles that focused on such temporal changes.

The focus on the persistence and decay of brokerage opportunities began with Burt's (2002) 4-year study of bankers' networks showing that brokerage ties decay quickly. His findings are consistent with a mirror image of Krackhardt's (1998: 24) finding that particularly resistant to decay are Simmelian ties, that is, when two actors "are reciprocally and strongly tied to each other and [also] to at least one third party in common." Several reasons could explain the rapid decay of brokerage ties. Stovel et al. (2011) list three possibilities. First, since many bridging ties are weak ties, they are easily disconnected. Second, a broker

may be a conflicted actor experiencing role conflict from at least two different, disconnected actors. Third, the opportunity for a broker to extract excess gains from information asymmetries erodes confidence in the broker. Decay may also occur because the broker and alters tend to come from different social circles and do not share mutual acquaintances who can intervene if the dyadic relationship deteriorates (Feld, 1997). Decay may also be a function of adding many bridging ties and thereby making the network too dense and closed. Gulati, Sytch, and Tatarynowicz (2012) found that as an industry matures, brokerage ties eventually saturate the space between clusters, making clusters more and more interconnected and making brokerage opportunities rarer. Consistent with balance theory (Heider, 1958), such triadic closure is most likely if actors have positive ties with the broker (Sytch & Tatarynowicz, 2014) and are not competing for resources with the broker (Zhelyazkov, 2018).

Despite the notion of rapid decay, research has also shown that the presence of brokerage ties in the past best predicts the formation of current brokerage ties, just as past network closure predicts current closure (Kleinbaum, 2018). This could result from brokers continuing to add nonoverlapping ties to their networks (Sasovova et al., 2010) and/or by cutting redundant ties (Jonczyk, Lee, Galunic, & Bensaou, 2016) or, in the case of closure, by introducing any new ties to their current ties in a closed network. Perhaps as a result, Sasovova et al. (2010) found that some of the structural holes at the earlier period had been closed by the later period (7.5%), some remained open (13%), and a much larger number of new structural holes (i.e., brokerage ties) came into existence.

One source of such persistence in brokerage networks might come from brokering behavior (Obstfeld, 2005). Tertius separans behavior maintains the status quo by keeping alters apart, while tertius iungens behavior closes some structural holes though at the same time generates a social momentum for new ties and thus new structural holes. Another source of persistence in brokerage networks can come from a "time-delayed brokerage" process in which knowledge mobilized through one tie can later become a relevant resource to be brokered via another tie. Such time delays could involve ties going dormant (Levin, Walter, & Murnighan, 2011), especially if the most valuable such ties are reconnected (Walter, Levin, & Murnighan, 2015) or if the memories of those ties are strong (Levin & Walter, 2018). Time-delayed brokerage could also involve active ties where previously transmitted or yet-to-be transmitted knowledge is dormant.

The persistence and decay of brokerage ties matter because the performance effects of brokerage may vary with the age of the ties composing a network. For example, the performance benefits of a broker's ties decrease with their age, as brokerage ties are often short-lived and prone to conflict by opportunism (Stovel et al., 2011). If a long-term tie develops in a brokerage network, the broker's return is diminished as the alters become less dependent on the broker (Bidwell & Fernandez-Mateo, 2010). In contrast, the performance benefits of closure (nonbrokerage) ties increase with their age, as it may take time to build the closure advantages of trust and integration. Thus, Baum et al. (2012) recommend a hybrid network position comprising a mixture of both types of ties—combining trust benefits from old closure ties and brokerage benefits from new brokerage ties—to get the maximum benefits. Consistent with this recommendation, in examining the sequencing of brokerage behavior by individuals, Burt and Merluzzi (2016) found that actors who oscillated over time between a closure strategy within groups and a brokerage strategy between groups got higher returns than those who stayed with one network strategy. They argue that the closure

strategy provides both insider knowledge and trust that subsequently allow the broker to create brokerage ties to new groups. Their results reinforce the importance of examining brokerage dynamics in future research.

Insights for Future Research

Despite the abundance of studies on brokerage, our review revealed important research gaps (RG), which raise promising opportunities for future research. Drawing on the categories of the integrative framework in Figure 1, we examine these opportunities with the aim of identifying future research directions (FRD) as summarized in Table 1.

Opportunities for Future Research on Brokerage Structure

Most of the studies we reviewed used ego network measures of brokerage, such as Burt's (1992) constraint index or effective size (RG1). Although this ego network approach has proven useful, mapping the broader social structure in which personal networks are embedded may enrich our understanding of brokerage. Thus, we see a need for future research to extend the structural analysis to include the whole network within which the open triad occurs (FRD1). The research on secondhand brokerage reinforces the need to consider ties beyond the triad, including both brokerage and nonbrokerage ties. For example, looking beyond direct ties raises the possibility that more than one broker may exist between two disconnected alters. An alternative broker changes the power dynamics, as the two disconnected alters have an alternative path for the flow of resources, making it harder for either broker to play one alter off against the other or extract payment for facilitating the flow of resources or for connecting the two alters.

Extending brokerage analysis to the larger network raises the question of how network centrality—that is, being connected to a large number of actors in a network—plays a role in becoming a broker. For instance, some scholars (e.g., Nerkar & Paruchuri, 2005) find that centrally located brokers (relative to peripherally located brokers) are perceived as important leaders with more access to resources controlled by other actors. By having a large number of contacts in the network, a central broker will likely be more aware of brokerage opportunities than peripheral brokers and become the "broker of choice" for alters. Central brokers may acquire a reputation for the efficient flow of resources and become activity hubs, the "go-to" brokers for getting things done.

Moreover, we see a need to design future studies that explicitly consider whole-network structures, such as small-world and core–periphery structures, as the context within which brokerage occurs. Most of the studies we reviewed implicitly assumed a small-world structure, that is, densely connected clusters with a few bridges connecting different clusters, hence the theoretical emphasis on obtaining nonredundant information. However, a focus on core–periphery structures suggests a shift in theory, focusing on the assumed quality or value of the resources/information possessed by alters. Core–periphery structures result from a few actors—often higher status—connected to each other at the core, with peripheral actors connected to the core but not to each other. This type of network structure makes it easy for the core elite to broker the peripheral actors and the reverse difficult. Thus, the overall structure of the network and actors' position in that structure may affect brokerage behavior and outcomes.

Table 1
Selected Opportunities for Future Research on Network Brokerage

Categories	Research Gaps (RG)	Future Research Directions (FRD)	Examples of Research Questions
Brokerage as structure	RG1: Brokerage examined using the ego network data and measures	FRD1: Expand the scope to study the whole network	• What is the role of network centrality in becoming a broker? • Are centrally located brokers in an advantage position as compared to noncentrally located ones? • What is the difference between small-world and core-periphery structures in shaping brokerage behavior and outcomes?
	RG2: Brokerage mostly investigated at single level of analysis	FRD2: Embrace multilevel research to understand the cross-level influences among individuals, groups, organizations, and communities, and their effects	• Can we assume that brokerage is the same at all levels of analysis? If not, what are the different performance implications of brokerage structure at different levels of analysis (i.e., individual, group, organizational, community)? How do performance effects at different levels relate to each other? • What are the microfoundations of brokerage? How do actions and interactions at the micro level of analysis and individuals' characteristics (e.g., beliefs, values, heuristics, abilities, motivations) influence macrolevel brokerage processes and outcomes?
	RG3: Brokerage examined mostly in terms of network structure (structuralist perspective), overlooking the content of brokerage ties	FRD3: Explore the content of brokerage ties	• How does the content of ties (e.g., task advice, emotional support, buyer/supplier) influence the brokerage structure? • Does multiplexity (e.g., multiple content of ties) play a role? How do a broker's multiple content ties (i.e., multiple ties) affect the alters' perception of the broker's trustworthiness? • How does the emotional content of ties between alters, as well as between the broker and alters, affect their connections and disconnections? For example, what is the role of negative ties in brokerage?
Brokerage as behavior	RG4: Brokerage conceived merely as an instrumental and intended behavior, overlooking variation in awareness and intentionality	FRD4: Explore the role of intentionality and awareness in brokerage	• Can brokerage happen when the broker lacks the intention and/or awareness to broker? When and under what conditions does a broker unintentionally broker? What would brokerage look like in such cases? • How does brokerage unfold when the alters lack intention and/or awareness to be brokered? • How is the intention to broker related to the ability to broker? • Are different types of brokerage possible depending on different degrees of intention and ability to broker? • How do different brokerage purposes (and/or the lack of purpose) influence brokerage and its underlying dimensions?
	RG5: Broker regarded as the predominant focus in brokerage examinations	FRD5: Devote attention to the alters in the triad, alters external to the triad, and brokers that are alters in other triads	• What can the alters do to avoid being exploited by a broker and enhance their benefits? • What other actors besides the broker play a role in shaping brokerage, and how does taking into account such actors change the current perspective adopted to study brokerage? • Does observing a broker in action (i.e., brokerage visibility) influence the perception by alters—outside the open triad—about that broker or other brokers? • When does a broker's new alter become a broker of the tie between the original broker and the new alter's own ties? • What are the mutual benefits that an alter and a broker achieve by brokering?

(continued)

Table 1 (continued)

Categories	Research Gaps (RG)	Future Research Directions (FRD)	Examples of Research Questions
Antecedents	RG6: Brokerage antecedents mostly linked to the broker's position in a network (i.e., mostly related to the structural dimension)	FRD6: Explore the drivers of brokerage behavior	• What are the brokerage antecedents that foster deliberate versus assigned brokerage? How do such antecedents affect brokerage behavior and outcomes? • Why do different actors undertake brokerage? What are the different goals that brokers have when brokering? • Under what circumstances are social media a source of brokerage? • What are the group- and organization-level antecedents of brokerage behavior?
Outcomes	RG7: Brokerage outcomes mostly examined from economic and knowledge perspectives	FRD7: Encompass a wider range of brokerage outcomes, including affective and relational aspects	• How should we conceptualize and measure "success" in brokering? • How do different types of brokerage outcomes affect each other? Are there positive/negative complementary or substitutive effects? • What kind of affective (e.g., loneliness, anger) and relational (e.g., changes in tie strength) outcomes result from brokerage? How do such outcomes affect different actors differently? • What is the affective cost of brokerage for the actors involved (e.g., energy depletion)? How do alters feel after being unintentionally brokered? • Is there a too-much-of-a-good-thing effect that reduces the marginal benefits from brokering and/or triggers negative consequences? • To what extent does any optimal level of brokerage differ among different types of individuals, groups, and/or organizations?
Moderators	RG8: Brokerage moderators mostly affecting the causal link between brokerage and outcomes	FRD8: Consider possible moderators of the causal link between brokerage antecedents and brokerage	• Are there moderators that affect the ease and/or speed of an actor's becoming a broker or engaging in various brokerage behaviors? • What are the moderating factors that enhance or diminish the impact of antecedents on a broker's ability and willingness to develop multiplex ties in the network? • How do technologies influence the causal links between brokerage antecedents and brokerage? For example, how can social media, big data, and analytics facilitate the identification—and amplify the reach—of potential brokering of disconnected alters?
Brokerage dynamics	RG9: Brokerage considered as an event or process that happens only once	FRD9: Analyze the implications of repeated brokerage on the same or new connections	• How do prior actors' brokerage experiences influence new instances of brokerage? What are the implications of adopting brokerage many times across the same ties (one-time vs. repeated-times brokerage)? • Are there any reciprocity mechanisms (e.g., information/resources sharing) that allow the broker to keep good relations with alters over time? • How do temporal and situational factors (e.g., global and national crises, external threats/environmental jolts, stages of economic development, industry/firm/human life cycle stage, declining performance) affect brokerage? • When and how does an actor undertake multiple brokerage initiatives simultaneously versus in sequence? • What changes when a broker transfers information collected from an alter in the past to another alter in a different moment?

Our review revealed that brokerage has been investigated mostly at a single level of analysis (RG2). However, following our prior suggestion to extend the structural approach to consider additional ties of brokers and alters, we see a need for multilevel research to understand the cross-level influences among individuals, groups, organizations, and communities, and their effects (FRD2). For example, Fernandez and Gould's (1994) study of different brokerage roles shows how the higher-level group affiliations of both the broker and the alters influence their brokerage roles. We also note that alters can be linked by brokers at different levels of analysis; that is, individuals can be brokered by organizations (Small, 2006), or groups can be brokered by individuals (Kemeny, Feldman, Ethridge, & Zoller, 2016). Indeed, brokers can be influenced by cross-pressures from the different groups to which they belong (Tasselli & Kilduff, 2018). Building on this, we can explore how a lower-level network (i.e., presence of a brokerage tie between individuals) affects outcomes at a higher level (i.e., group/organization cooperation). Brokerage can have an essential role in connecting the micro and macro levels of analysis, where individual network strategies may coalesce with the emergence of public goods and social integration at the higher level.

In the future, we expect growing interest in the exploration of brokerage microfoundations, unpacking the brokering interactions and reactions of microlevel entities—such as the beliefs, values, norms, and heuristics of brokers and alters—to explain macrolevel phenomena. Research has recently started analyzing the multilevel implications of brokerage, observing that it may be beneficial to a group by bringing in new ideas and solutions (Fleming, Mingo, et al., 2007) but manifest negative consequences for individual brokers or alters within the group (Bizzi, 2013). Ibarra, Kilduff, and Tsai (2005: 367) suggested examining when "the individual pursuit of network advantage detracts from or contributes to the emergence of public [collective] goods." For example, broker firms in geographical clusters are less likely to participate in and contribute to regional institutions that provide collective support services to firms in the region, as they are concerned about leakage of proprietary information via these regional institutions (McEvily & Zaheer, 1999). Though individual and collective advantage can coalesce, little research has explored how this tension is managed (see Lingo & O'Mahony, 2010, for an exception). We can also examine cross-level moderator models for situations in which a construct at one level of analysis influences the strength/direction of the causal links between constructs at another level. Combining measures at different levels, researchers might ask how brokerage at the individual level within the group interacts with the centralization of the group to affect important outcomes, such as individual power. Although possible, such analyses have rarely been undertaken (see Paruchuri, 2010; Sasidharan, Santhanam, Brass, & Sambamurthy, 2012, for exceptions).

While the preceding discussion is focused on cross-level influences, our review indicated that multilevel perspective can benefit brokerage research done at a single level of analysis, too. We found that studies of interpersonal and interorganizational brokerage networks have used the same theoretical motivations and explanations, with an implicit assumption that actors, whether they be individuals, groups, or organizations (or communities), could be theoretically treated the same. For example, both Obstfeld (2005) and Ahuja (2000) study how brokerage influences innovation, but the former at the individual level and the latter at the firm level. The assumption is that access and control of resources have the same brokerage benefits regardless of level of analysis. While the abstract nature of actors and ties in network analysis may allow for such broad application of concepts and measures, the question of whether individual, group, and organizational brokerage are isomorphic across levels remains unaddressed,

and research on brokerage as behavior may provide insights. For example, brokering intent may look very different for firms than for individuals. We see need for future research to look for when, why, and how brokerage does (or does not) manifest consistently across the different levels of analysis. Empirical investigations and validation of the assumption that brokerage is the same across levels have been largely absent (Moliterno & Mahony, 2011).

Our review of research revealed that brokerage has been mostly examined in terms of network structure, largely overlooking the content of brokerage ties (RG3), with such information typically relegated to the Methods sections of the manuscripts (see Borgatti, Brass, & Halgin, 2014, for more on network content and context). However, as Aral and Van Alstyne (2011: 95) suggest, "networks are not simply pipes into different pools of information; they reflect the nature of the relationships, interactions, and information exchanges taking place among those they connect." Thus, we encourage scholars to explore the content of brokerage ties (FRD3). For example, brokerage involving ties that provide task advice differs in important ways from brokerage involving ties providing political support, emotional support, career advice, or price information, to name just a few (e.g., Podolny & Baron, 1997). Moreover, as we have noted, relationships often involve multiple types of connections, and brokers and alters may be connected or disconnected depending on the type of network content studied. For example, network ties might seem closed/dense with few brokerage ties in one context (e.g., professional ties) but seem open/sparse with many structural holes in another context (e.g., friendship ties). So the network can be interpreted as open or closed depending on the content of the ties (Obstfeld et al., 2014). Yet, in our review, even among the studies that take into account the content of ties (e.g., Podolny & Baron, 1997), we found few examples of multiplex (i.e., multiple content) brokerage ties.

Furthermore, brokering disconnected ties of one sort (e.g., friend) may affect connected ties of another sort (e.g., coworker). For example, it may be difficult to broker disconnected alters on one type of tie when they have connections on other types of ties; they would likely close the structural hole. Although the "middleman" position of the broker can foster distrust in some competitive or cultural environments, if brokers have multiple content ties (i.e., multiplex ties) to each alter, alters may perceive a broker as more trustworthy, alleviating any need to hide their brokerage. The broker, in turn, may also be less likely to act opportunistically, to prevent the loss of a multiplex tie (Brass, Butterfield, & Skaggs, 1998).

We also see a need for understanding the emotional content of ties, particularly negative ties, between alters as well as between broker and alters. For example, the nature of a "lack of a tie" between alters can be ambiguous. Among the important research questions, there is a need to explore if alters are unaware of each other, if they are simultaneously connected and disconnected depending on the content, whether their disconnection involves a negative tie or a negative tie that had previously been positive, or if the tie is simply dormant (Levin et al., 2011). The answers to such questions are likely to substantially change the conceptualization of both brokerage behavior and outcomes. The role of negative ties in brokerage is thus still ambiguous, and researching it may unearth new mechanisms that diverge significantly from current knowledge about brokerage structures.

Opportunities for Future Research on Brokerage Behavior

The cognitive aspects or assumptions of brokerage behavior, such as variations in awareness and intentionality, have received little attention (RG4), as most reviewed studies

conceptualize brokerage as an instrumental and intended behavior that actors deliberately undertake when presented with a brokerage opportunity. Yet, intentionality and awareness cannot be taken for granted, and we see a need for exploring their role in brokerage (FRD4). Clearly, we cannot assume behavioral agency/strategy on the part of the broker if the broker is unaware of the brokerage opportunity. Understanding the role of actors' intentions, as well as exploring their absence, offers fruitful opportunities for future research. For instance, researchers could consider combining a broker's lack of intention to broker and alters' lack of awareness. More generally, there is a need to disentangle opportunity, awareness, and intent. Relatedly, existing research has not explicitly considered that brokering behavior may be motivated by different purposes. Moving beyond the tertius iungens or tertius separans (gaudens) behaviors may shed light on the reasons that spur brokers to behave as they do. Research on brokerage motivation could unpack the causes of alternative patterns of brokerage and their underlying dynamics, perhaps using methodologies not typically associated with networks scholarship, such as qualitative research. Thus, we see a need to disentangle how the intention to broker is related to the ability to broker and how the broker's purpose in brokering affects brokerage and its underlying dimensions, as these are crucial yet still unaddressed questions.

Prior research on brokerage as behavior has paid predominant attention to the broker, overlooking the other actors internal and external to the triad (RG5). However, the focus on brokerage behavior needs to move beyond a simple "keep them separated or bring them together" dichotomy employed by a broker and recognize the agency of the alters, the role of actors external to the triad, and situations where a broker is also an alter (FRD5). For example, scholars could investigate if alters seek out brokers for their convenience, for referrals, or when the disconnect involves distrust of the other alter (Brass, 2009). Alters may continue to use a broker who has successfully satisfied their needs in the past or build ties to other alters when they distrust the broker or simply want to "cut out the middleman." Alters may not realize another actor's position as broker, be aware that they themselves are being brokered, or understand the goal or consequences of such brokerage (Fernandez-Mateo, 2007). Future research might thus examine the impact of "brokerage visibility"—as perceived by alters as well as by outside third parties—on various outcomes, including reputation, trust, and the willingness to engage in future exchanges. For example, do actors seek out a broker after seeing the broker, or other brokers, provide positive outcomes to other alters?

Building on the observations collected from our literature review, we see the need to explore the simultaneous roles of an actor as both broker and alter. For example, each time a broker reaches out to a new alter not connected to any of the broker's other ties, this new alter also may act as a broker between the new alter's contacts and the original broker (Brass, 2009). Thus, when the study's scope is extended to measure the extended network structure and/or position within the whole network, every actor in a brokerage relationship could be considered structurally both broker and alter, and structural measures and statistical analyses would treat them similarly. The broker/alter distinction is contingent only on one's frame of reference as to which actor is considered the focal actor. This suggests the need to focus on the behavior of both the broker and the alters.

Perhaps it is the brokering—that is, how each actor behaves in response to a given brokerage opportunity—that distinguishes actors in such cases. As our review shows, brokerage can often be beneficial to both broker and alters. More generally, scholars could analyze the "mutual benefit" that an alter and broker achieve by brokering. Of course, the exception to mutual benefit is when brokerage occurs in the context of mutually exclusive exchange

partners (Cook & Emerson, 1978), such as choosing one vendor over another. As Borgatti and Halgin (2011) note, brokerage involving the choice of one alter, to the exclusion of the other, does not easily fit the typical network flow model implicitly invoked in network research (nor does the excluded alter appear in the data). Their suggestion of an alternative model, labeled the bond model, focuses on power, dependency, and mutual exclusion and emphasizes the importance of considering the broader network context. Similarly, Kilduff and Brass (2010) note the importance of considering differences in cooperative versus competitive contexts. Adopting a brokerage perspective that considers a wider range of actors, beyond the broker, has the potential to advance current understanding of how brokerage behavior unfolds.

Opportunities for Future Research on Brokerage Antecedents

A key finding from our review is that most investigated antecedents focus on the drivers of brokerage structure, analyzing the causes of network configuration and occupation of a brokerage position, with little attention directed to the antecedents of brokerage behavior (RG6). Thus, we see a need to further explore the drivers of brokerage behavior (FRD6). For instance, much of the research on brokerage antecedents originates with the assumption that a broker builds ties to disconnected alters. Janicik and Larrick (2005) and Burt and Ronchi (2007) illustrate this approach, as does research on self-monitoring. However, some brokers are *assigned* their structural position, rather than striving to occupy it. For example, managers in organizations often inherit a brokerage role between subordinates and superiors, with accompanying authority and required brokerage responsibilities. While most network methodologies for capturing brokerage structure do not differentiate between deliberate and assigned brokerage behaviors, we note that this form of assigned brokerage may differ considerably from the typically assumed deliberate brokerage of most existing studies. Although managers may readily accept their brokerage roles, brokerage antecedents that foster deliberate versus assigned brokerage may substantially affect brokerage behavior and outcomes. Moreover, we encourage future scholars to investigate different drivers of brokerage that have been neglected by prior research and have undergone a major transformation in recent years. For instance, online social media platforms, like Facebook, LinkedIn, and Twitter, could shape the antecedents of brokerage either by creating more opportunities to bridge across previously unconnected actors or, conversely, by increasing pressures to eliminate brokerage by bringing everyone together. Furthermore, while there is a good deal of individual-level correlational data from which to infer antecedents of network connections (Brass, 2012), less attention has been directed to the same antecedents on different brokerage dimensions or to previously unexamined antecedents, for example, at the group or organizational level.

Opportunities for Future Research on Brokerage Outcomes

Although almost all the reviewed studies included an outcome, we note that prior research has focused predominantly on economic and knowledge outcomes, with limited research attention devoted to possible affective and relational outcomes (RG7). Thus, we see a need for research on a broader set of outcomes of brokerage to help identify the meaning of a "successful brokerage" (FRD7), potentially redefined as the satisfaction of all actors involved in brokerage. For instance, for a broker, success might be achieving not only economic aims but also having the alters not feeling frustrated or exploited. Examining noneconomic outcomes

that are negative—for example, feeling morally impure (Casciaro, Gino, & Kouchaki, 2014), less satisfied (Bizzi, 2013), or lonely when brokering—might also shed light on why some actors occupying a broker position decide not to take advantage of brokerage opportunities. For alters, avoiding exploitation by a broker, including feeling betrayed by having their secrets divulged, is clearly important.

Another major direction for future research concerns exploring the "optimal level" of brokerage. For instance, we encourage scholars to investigate the economic and noneconomic effects of "too much" brokerage—for either the broker or the alters—to see if there is an optimal level of brokerage for individuals, groups, and/or organizations.

Opportunities for Future Research on Brokerage Moderators

Prior research has adopted a restricted approach by conceptualizing and testing moderating factors affecting only the causal link between brokerage and outcomes, largely ignoring moderators of the causal link between brokerage antecedents and brokerage (RG8). Thus, we see a need to expand the scope of moderators to develop a deeper understanding of the factors that shape the antecedents–brokerage link (FRD8). For instance, future research might explain why actors with the same antecedents, such as certain personality traits, are not necessarily equally likely to be in a broker position or to engage easily and quickly in brokerage behavior. Moreover, future research could explore the moderating factors that enhance or diminish the impact of antecedents on a broker's ability and willingness to engage in matchmaking or to develop multiplex relationships in the network. Recent technologies, such as social media, big data, and analytics, may facilitate the identification, and amplify the reach, of potential brokering of disconnected alters. Thus, we encourage future scholars to understand how such technologies may influence the causal link between brokerage antecedents and brokerage.

Opportunities for Future Research on Brokerage Dynamics

Finally, our review revealed a largely static analytic approach adopted to investigate brokerage (RG9). This conception of brokerage as occurring only once in time and space has led to interesting findings but has left brokerage persistence and recurrence largely unexplored (see Sasovova et al., 2010, for an exception). Thus, we see a need to consider the implications of repeated brokerage on the same or new connections (FRD9). There is a need to explore the influence of an actor's prior brokerage experiences on new instances of brokerage and how adopting brokerage many times across the same ties (one-time vs. repeated-times brokerage) influences brokerage and its outcomes. For instance, we call for future research aimed at detecting the presence of reciprocity mechanisms (e.g., information/resources sharing) that allow the broker to keep good relations with alters over time or at understanding the effect of temporal and situational factors of brokerage (e.g., global and national crises, external threats/environmental jolts, stages of economic development, industry/firm/human life cycle stage, declining performance). Moreover, multiple brokerage initiatives can occur simultaneously and/or in sequence, and we see a need to explore the differences between these two types of occurrences as well as the circumstances and conditions that lead an actor to undertake either of them. In this regard, we also see the need for further investigation of "time-delayed brokerage" by exploring how past information and knowledge mobilized through one tie can later become relevant resources to be brokered via another tie.

Methodological and Empirical Challenges

Of course, embracing a dynamic, longitudinal approach to investigate brokerage implies methodological and empirical challenges. The few studies that sought to grasp brokerage dynamics relied mainly on archival data, such as email logs (Quintane & Carnabuci, 2016), user data scraped from Facebook (Wimmer & Lewis, 2010), or co-membership networks among musical production teams (Uzzi & Spiro, 2005) or TV production teams (Zaheer & Soda, 2009). We encourage scholars to increasingly draw on these and other types of asynchronous digital communications (e.g., online blogs and web forums). For aspects of brokerage ties that involve perceptions or memory, however, such archival measures of (possibly forgotten or unobserved) activities may be less relevant (Levin & Walter, 2018); in such cases, traditional survey-based approaches for collecting longitudinal data may be more appropriate. However, we acknowledge the difficulties of collecting longitudinal primary data adopting such traditional data sources. One promising development is the use of visual network scales (Mehra et al., 2014), which can reduce substantially the burden on survey respondents. In addition, we call for alternative approaches to supplement the existing data and methods that are widely diffused in prior research. Using novel data sources, like wearable sensors (Ingram & Morris, 2016), may be particularly useful for understanding brokerage dynamics among multiple actors (brokers, alters, and others), especially in networking events, such as exhibitions or trade association meetings. In addition, we see the potential of conducting longitudinal brokerage studies by using data on crowdsourcing, a particular form of brokerage involving dispersed individuals who collaborate in finding the solution to a given problem by contributing knowledge and expertise that are not present within the organizational boundaries (e.g., Roth, 2015).

Future research may also usefully employ qualitative approaches for in-depth event histories, action-formation mechanisms, and further understanding of why and how processes and dynamics related to brokerage unfold. For example, multiple-case studies are useful for comparing different brokerage processes and building theory on the causal links that explain the emerging outcome variation. Ethnographic approaches and process studies can be employed for understanding the emergence, transformation, and adaptation of brokerage over time. Discourse studies are suitable to analyze the narrative development that shapes the actions, meaning, and interactions of brokerage actors (e.g., analyses of speech or written communication patterns). Such qualitative approaches would also be useful in mixed-method research designs, either to complement and contextualize the insights gathered from quantitative studies (e.g., Uzzi, 1997) or to develop hypotheses for subsequent quantitative testing (e.g., Vissa, 2012). In addition, experimental methods—whether in the field, lab, or online—may also be useful in understanding the microdynamics of brokerage tie formation, behavior, maintenance, and dissolution, including allowing researchers to isolate the causal mechanisms involved.

Finally, simulations (e.g., agent-based models) examine the emergent outcomes of the dynamics of simultaneously interacting rule-based micro agents (i.e., broker and alters) to account for a particular observed brokerage outcome, such as the broker's control and access to resources. As such, simulations are particularly useful for understanding the bottom-up emergence of brokerage, modeling aggregation as it unfolds over time. Experimental approaches may be especially useful for understanding top-down (treatment) effects. For instance, such approaches can be particularly promising for exploring the affective and

cognitive foundations of brokerage behavior. Counterfactual approaches and related modeling techniques (e.g., Bayesian narratives, causal graphs, and counterfactual testing and evaluation; cf. Morgan & Winship, 2015) can be used to advance current understanding of causation in brokerage dynamics and to clarify how brokerage outcomes are achieved. Counterfactual approaches can be applied in both qualitative and quantitative analyses. In addition, causal modeling can help to reconceptualize the influences between actors, resources, and outcomes in a temporal perspective. For example, causal modeling may help to disentangle whether the use of specific resources will enable the pursuit of a specific brokerage behavior or, on the other hand, whether the decision to execute a particular brokerage behavior will determine a specific way of using a resource. Moreover, qualitative comparative analysis can prove particularly powerful for the counterfactual analysis of causal complexity (Greckhamer, Fumari, Fiss, & Aguilera, 2018), as it involves different combinations of causal conditions capable of generating the same outcome. Accordingly, it may be useful to identify and compare different configurations of brokerage structure and behavior and to understand how changes in such configurations would result in similar brokerage outcomes. There are other methods, as well (e.g., time-series analytics, topic modeling, tensor decomposition), that might also be helpful to researchers focusing on brokerage dynamics. In sum, pursuing future research to advance the brokerage literature has the potential to expand both the types of data we use as well as the methods we adopt.

Conclusion

To help advance the field's understanding of network brokerage, we first reviewed studies of brokerage and then developed an integrative framework. By integrating the insights from our literature review, we provide a focused set of suggestions for future research. We suggest that brokerage research has advanced considerably since the pioneering work of Burt (1992) and others, and our hope is that our efforts to integrate the knowledge generated by dispersed streams of literature is beneficial in advancing understanding of the brokerage concept and related phenomena. Indeed, there remain many opportunities for management and other social science researchers to engage more fully with network brokerage, from a theoretical, empirical, and practical standpoint.

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Notes

1. In the online supplement, Figure S1 and the Methodological Supplement provide a detailed description of the article selection process. We also provide details of each study in Table S1 in the online supplement.

2. We note that some network studies refer to "bridges" (or boundary spanning) not in the classic network brokerage sense of a broker being linked to otherwise disconnected alters but rather as ties that bridge across a

formal organizational boundary (Tortoriello & Krackhardt, 2010), across areas of expertise (Reagans & McEvily, 2003), or across demographic groups (Reagans & Zuckerman, 2001).

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