

Whether, How, and Why Networks Influence Men’s and Women’s Career Success: Review and Research Agenda

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Substantial research has documented challenges women experience building and benefiting from networks to achieve career success. Yet fundamental questions remain regarding which aspects of men’s and women’s networks differ and how differences impact their careers. To spur future research to address these questions, we present an integrative framework to clarify how and why gender and networks—in concert—may explain career inequality. We delineate two distinct, complementary explanations: (1) unequal network characteristics (UNC) asserts that men and women have different network characteristics, which account for differences in career success; (2) unequal network returns (UNR) asserts that even when men and women have the same network characteristics, they yield different degrees of career success. Further, we explain

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why UNC and UNR emerge by identifying mechanisms related to professional contexts, actors, and contacts. Using this framework, we review evidence of UNC and UNR for specific network characteristics. We found that men's and women's networks are similar in structure (i.e., size, openness, closeness, contacts' average and structural status) but differ in composition (i.e., proportion of men, same-gender, and kin contacts). Many differences mattered for career success. We identified evidence of UNC only (same-gender contacts), UNR only (actors' and contacts' network openness, contacts' relative status), neither UNC nor UNR (size), and both UNC and UNR (proportion of men contacts). Based on these initial findings, we offer guidance to organizations aiming to address inequality resulting from gender differences in network creation and utilization, and we present a research agenda for scholars to advance these efforts.

Keywords: *gender; networks; career success; career inequality*

Gender gaps remain in the professional success and economic opportunity afforded to men and women worldwide (Nova, 2019). Among the many explanations for gender differences in career success (e.g., advancement, income, satisfaction) is a long-standing and persistent concern that women do not build or benefit from professional networks in the same way as men (cf. Ely, Ibarra, & Kolb, 2011; Lyness & Thompson, 2000). In response to substantial research documenting personal accounts of networks acting as barriers to women's career advancement, Ibarra (1993) called for empirical studies to identify which aspects of men's and women's networks differ and whether such differences relate to career success. Over 25 years later, answers to the fundamental questions of *whether*, *how*, and *why* networks contribute to gender-related career inequality remain obscured for three reasons.

First, a "network" is a multifaceted concept that researchers assess in various ways, each conveying access to different career-benefiting resources (see Table 1). Yet researchers rarely articulate the role of specific network characteristics in men's and women's career success. Moving from investigating "networks" in general toward a systematic study of network characteristics is necessary to understand which specific aspects of men's and women's networks function differently in driving career success.

Second, implicit in this literature are two overarching explanations for how gender may influence networks to explain men's and women's career success. Rooted in the interpersonal processes of network creation and network utilization, respectively, the *unequal network characteristics* (UNC) explanation asserts that men and women have different network characteristics, which account for differences in career success; while the *unequal network returns* (UNR) explanation asserts that even when men and women have the same network characteristics, they yield different degrees of career success. Importantly, when these two explanations occur together, they may result in men and women receiving similar returns *because* they have different levels of a network characteristic (i.e., functional differences), or one gender may experience compounding (dis)advantage. Thus, our integrative review evaluates whether gender differences in network creation and utilization contribute to career inequality through UNC, UNR, both, or neither explanation for specific network characteristics.

Third, researchers have drawn on many theoretical rationales to explain differences in men's and women's networks or career success returns from their networks. However, in the absence of an organizing conceptual framework, the literature has suffered from inconsistent theorizing regarding *how* and *why* gender and networks influence career inequality. We aim

Table 1
Network Characteristics, Definitions, and Theoretical Links to Career Success

Characteristic	Definition	Theoretical Link to Career Success
<i>Same-gender contacts</i>	The extent to which an actor's contacts are the same gender as the actor	Offer increased access to work- or career-benefiting resources, due to a tendency to exchange resources with similar others
<i>Men contacts</i>	The extent to which an actor's contacts are men	Offer increased access to work- or career-benefiting resources, particularly in contexts where men occupy higher status positions
<i>Contact status</i>		"Offer increased access to work- or career-benefiting resources and may serve as a signal to others of one's competence/status, encouraging others to be more willing partners"
<i>Structural</i>	The extent to which contacts have many connections	
<i>Relative</i>	The extent to which contacts are of higher or lower status	
<i>Average</i>	The average level of a status characteristic across contacts (e.g., rank, education, occupational status, influence)	
<i>Open network</i>	The extent to which an actor serves as an intermediary (or broker) between two or more disconnected people or groups	"Open networks" offer increased access to and control over nonredundant (novel) information (i.e., brokerage position) "Closed networks" offer greater access to support, clear expectations for behavior, and a shared sense of identity
<i>Size</i>	The number of an actor's relationships with distinct network contacts	Increases the likelihood of having a network contact who can offer access to resources
<i>Closeness centrality</i>	The extent to which an actor can easily reach all contacts within a network	Increases the likelihood that one can mobilize a broader set of contacts to gain work- or career-benefiting resources
<i>Tie strength</i>	The depth of relationships across all of an actor's contacts (e.g., frequency, relationship longevity, emotional intensity, reciprocation)	Weak ties offer increased access to a wider variety of work- or career-benefiting resources; strong ties offer increased access to strategic, hard-to-access resources (e.g., influence)
<i>Kin contacts</i>	The extent that an actor's contacts are family members	Limit opportunities to connect with professional contacts, due to the time devoted to kin ties; motivated to provide resources but may offer redundant resources due to interconnectedness or resources irrelevant to work or career
<i>Diversity</i>	The extent that an actor's contacts have a variety or range of personal characteristics (e.g., relationship type, expertise)	Offer access to a wider variety of work or career-benefiting resources

Note: Network characteristics refer to the structural or compositional characteristics of a network (listed in the order they appear in the paper).

to provide greater conceptual clarity by presenting an integrative framework that synthesizes the various theoretical rationales and delineates which are relevant to UNC or UNR explanations for *how* networks factor in men's and women's career success. Further, we deepen existing explanations by pinpointing the gendered professional contexts, actor, and contact mechanisms involved in network creation and network utilization to explain *why* UNC and UNR occur.

Drawing from our integrative framework, we articulate the theoretical cases for *specific network characteristics* being unequal between and/or resulting in unequal returns for men and women. Then, we evaluate the empirical evidence for each characteristic to clarify whether career inequality can be attributed to UNC, UNR, neither, or both explanations. Finally, by clarifying the actor and contact mechanisms underlying UNC and UNR, our framework lays a foundation for future research to evaluate the contributions of gendered professional contexts, actors, and contacts to men's and women's career inequality. Such research is necessary to provide evidence-based interventions for policymakers, organizational leaders, and workers seeking to address network-related factors contributing to gender inequality in career success.

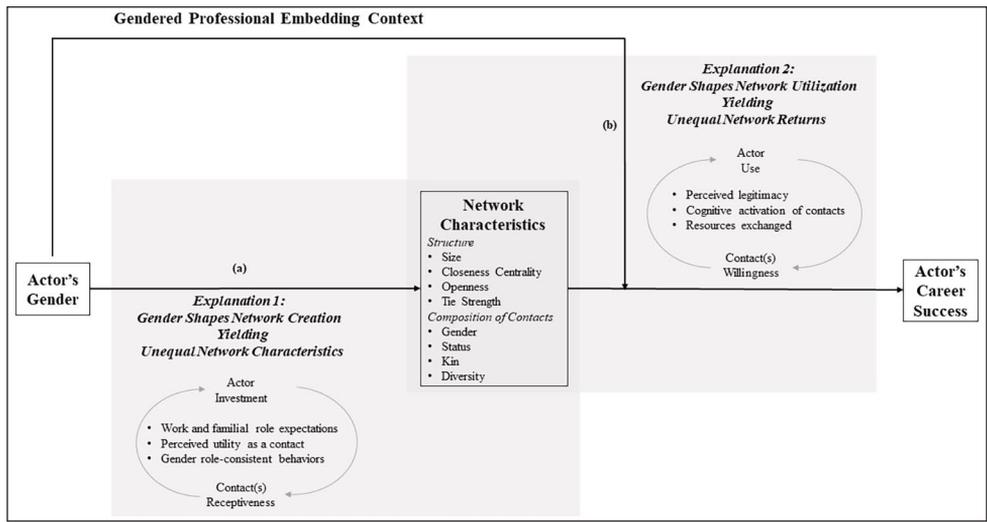
Grounding Assumptions

Networks—the set of relationships that exist among a group of people—offer access to resources that are useful for job performance (e.g., information, developmental feedback) and resources that lead directly to career success (e.g., sponsorship, highly visible work assignments; Sparrowe, Liden, Wayne, & Kraimer, 2001; Zou & Ingram, 2013). Gender, as a pervasive characteristic of human society, shapes societal norms—the social contexts in which people create and utilize their relationships—as well as the intrapersonal (psychological) and interpersonal (social) processes that constitute relationship development (i.e., network creation) and use (i.e., network utilization). Thus, to the extent that gender impacts network creation and utilization, networks may contribute to differential career advantages for men and women.

Social Role Theory (Eagly, 1987; Eagly & Wood, 1991) posits that the sexual division of labor at home (i.e., men as breadwinners, women as homemakers) and in the workplace (i.e., women concentrated in lower wage occupations and lower hierarchical levels) have contributed to norms or expectations for people based on their socially identifiable gender. Complementing this theorizing, aspects of Status Characteristics Theory (Berger, Cohen, & Zelditch, 1972; Berger & Fişek, 2006) recognize a gender status hierarchy within society wherein women possess less power, status, and resources than men because existing social systems value roles traditionally filled by men (e.g., breadwinner; Ridgeway, 1991). These theories point to a set of *gender role expectations* that characterize men as more concerned with professional pursuits, having higher power, status, and competence, and as more agentic (i.e., assertive, striving for personal gain), and characterize women as more concerned with familial responsibilities, having lower power, status, and competence, and as more communal (i.e., exhibiting concern for and desire to get along with others; Eagly & Steffen, 1984; Ridgeway, 1991).

Both men and women tend to internalize and adhere to societal gender role expectations, which influence their beliefs about how they and others should act as members of a gender category. People who behave in gender-normative ways tend to be rewarded, whereas those who behave in counternormative ways are penalized (Heilman, 2001). Gender role expectations tend to disadvantage women in professional contexts, where objective career success often requires agentic behaviors. Indeed, people expect greater competence from men than from women in most work settings, and they tend to reward men and women consistent with these expectations. As a result, men are perceived to be more deserving of work-related rewards than women and receive greater rewards than women of equivalent skill (Ridgeway,

Figure 1
Integrative Framework for Examining the Mechanisms Underlying Unequal Network Characteristics (UNC) and Unequal Network Returns (UNR) Explanations for Career Inequality



Note: Occurring within a broader professional context, actor and contact mechanisms during network creation and utilization explain why (a) *UNC* and (b) *UNR* may occur, respectively. Actor and contact mechanisms may influence one another. For instance, contacts' receptiveness to actors' relationship development attempts may impact actors' future investment decisions. Moreover, contacts may initiate relationship development and/or provide unsolicited resources to actors.

1997). In contrast, women who act in agentic ways, which are consistent with employment role expectations but not gender role expectations, are punished (Rudman & Phelan, 2008). Thus, gender—as a societal system of cultural beliefs—shapes occupational contexts, people's beliefs about themselves and others, and their interactions with each other (Ridgeway & Smith-Lovin, 1999).

Conceptual Framework for Understanding Network-Based Gender Differences in Career Success

Integrating network and gender theorizing, we present an organizing conceptual framework that clarifies *how* and *why* networks influence men's and women's career success (see Figure 1). Gendered professional contexts offer different opportunities for network creation and utilization for men and women, and they produce and reinforce the gender role expectations people hold for themselves and others. These expectations influence how actors and network contacts think and feel about themselves and others and, therefore, shape interpersonal interactions. Gendered context, actor, and contact mechanisms underlie two primary explanations for network-based gender inequality in career success: differential network creation (*UNC*) and differential network utilization (*UNR*).

Gendered Professional Contexts Shape Network Creation and Utilization

Network scholars have long recognized that professional contexts create and constrain opportunities for interpersonal interactions between actors and their (potential) network contacts. For example, aspects of the organization's design—such as team and departmental memberships, workflow patterns, and shared social foci (e.g., committees, task forces, social events or clubs)—increase opportunities for interaction between people with task interdependencies, similar interests, and shared social/professional identities and goals (Ahuja, Soda, & Zaheer, 2012; Kleinbaum, 2018). Similarly, *gendered professional contexts*—stemming from the disproportionate representation of men and women across industries, occupations, organizations, and levels of organizational hierarchies—influence network creation and utilization processes by (i) providing different opportunities for men and women actors to develop relationships with contacts and (ii) creating social pressures to adhere to and enforce gender role expectations for both men and women.

First, to the extent that professional contexts are gender-imbalanced, men and women have different opportunities to connect with others of the same and opposite gender (cf. Ibarra, 1993). Given that gender distributions are often skewed across organizational levels (e.g., U.S. Bureau of Labor Statistics, 2020), men and women also have different opportunities to connect with network contacts at upper hierarchical levels. Such divergent opportunities for network creation for men and women actors contribute to UNC.

Second, the disproportionate representation of men and women within a professional context (e.g., upper echelons) tends to reinforce gendered norms for interpersonal interactions, influencing both network creation and utilization. In these environments, gender role expectations are more salient and exaggerated, men and women are more likely to conform to expectations, and members of the numerical minority are more visible and become “representatives” of their ascribed gender category. As the gender proportion becomes more balanced, network contacts are exposed to more actors who behave in ways that are inconsistent with gender role expectations, which may enhance their understanding of variability within a gender and similarity between gender categories as well as reduce reliance on gender role expectations (Ely, 1995; Kanter, 1977). Thus, in gender-skewed environments, actor and network contacts' adherence to gender role expectations is heightened, contributing to both differential network creation and utilization for men and women actors.

Explanation 1: Gender Shapes Network Creation Leading to UNC

During network creation, actors and potential contacts initiate and respond to attempts to develop relationships with each other (Kleinbaum, Jordan, & Audia, 2015), which results in network characteristics that provide access to work- and career-benefiting resources. Actors and contacts hold gender role expectations that influence their beliefs about men and women actors' (1) work and familial role expectations, (2) utility as a network contact, and (3) appropriateness of engaging in gender-role-consistent behaviors. These beliefs impact *actor investment* in relationship development and (potential) *contact receptiveness* to actors' relationship development attempts, both of which may contribute to men and women actors developing different network compositions or structures, or *UNC*.

Work and familial role expectations. Men actors may be more successful at developing professional network relationships because doing so is consistent with gender role expectations

that they prioritize the professional domain over the personal domain, whereas the reverse is expected for women. For instance, men often experience more pressure to work long hours and engage in after-hours networking activities. In contrast, women often experience more pressure to limit their hours at work or return home after work to attend to home and familial obligations (Wellington, Kropf, & Gerkovich, 2003). Thus, gender role-related expectations may limit the opportunities women have to invest in professional relationship development compared to men. Further, potential contacts may expect that men are more committed to prioritizing (and should prioritize) their work and careers and that women are more committed to prioritizing (and should prioritize) home and familial responsibilities (Killewald, 2013). As such, potential contacts may be more receptive to forming professional relationships with men actors, compared to women actors.

Perceived utility as a contact. Men actors may also be more successful at developing network relationships than women actors because men tend to view themselves as capable and competent (e.g., overrating their abilities as compared to women; Correll, 2004). Others also tend to assume that men are more competent than women (Wood & Karten, 1986). In contrast, women's competence and expertise are often questioned (Thomas-Hunt & Phillips, 2004), undermining their self-confidence. Thus, compared to women, men actors are more likely to believe they have expertise and resources to offer potential contacts and, therefore, feel more comfortable investing in relationship development with (potential) network contacts.

Similarly, potential contacts may view men actors as more valuable network contacts than women actors because they perceive men as having greater access to beneficial information and resources. These beliefs also contribute to men being more often selected for work roles and assignments that help them gain expertise, confidence, and illustrate their competence to a range of potential network contacts (Wellington et al., 2003). In contrast, women receive fewer of these important, challenging assignments, which may perpetuate gender status beliefs related to competence. Indeed, Kanter (1977) notes that women may need to demonstrate that they are "not like other women," which suggests that they may have to take additional steps to signal that they are desirable network contacts. For instance, they may need existing contacts to vouch for their utility to new network connections, whereas men actors' utility is typically assumed.

Gender role-consistent behaviors. Men actors are likely more successful at developing professional network relationships than women actors to the extent that doing so requires agentic interpersonal behaviors. Gender roles cast men as agentic; thus, men may feel more comfortable or experience more social pressure to initiate professional relationships (Anderson & Galinsky, 2006) and openly communicate their expertise, accomplishments, or value as a network contact (Gruenfeld, Inesi, Magee, & Galinsky, 2008). Alternatively, gender role expectations characterize women as communal; thus, women may feel more comfortable or experience more social pressure to exhibit caring, helpfulness, and consideration by accepting and reciprocating contacts' relationship development attempts. Thus, to avoid backlash related to gender role-inconsistent behaviors, women may limit agentic behaviors and men may avoid communal behaviors that connote low status (Moss-Racusin, Phelan, & Rudman, 2010).

Moreover, network contacts may be more receptive to forming relationships with men in professional contexts as compared to women because the professional context often requires agentic behaviors, which are consistent with men's gender role (Ridgeway & Smith-Lovin,

1999). For example, engaging in agentic, self-promotion behaviors (used to illustrate expertise) during professional network creation is viewed as less desirable for women actors (Rudman & Phelan, 2008). Thus, contacts may be more receptive to relationship initiation attempts from men (women) who engage in agentic (communal) interpersonal behaviors, which may yield different levels of network characteristics for men versus women actors.

Explanation 2: Gender Shapes Network Utilization Yielding UNR

During network utilization, actors evaluate whether network contacts have and may provide them with valuable resources and then solicit resources from their contacts (Khattab, van Knippenberg, Pieterse, & Hernandez, 2020; Porter & Woo, 2015). In turn, network contacts evaluate actors and decide whether to provide requested or unsolicited resources (e.g., refer the actor for an opportunity). Gender role expectations influence men and women actors' and their contacts' (1) beliefs about the perceived legitimacy of leveraging networks, (2) cognitive activation of contacts, and (3) beliefs about the appropriateness of exchanging work- and career-benefiting resources. These tendencies impact *actor use* of relationships to access work- and/or career-benefiting resources and *contact willingness* to provide actors with such resources. Thus, even when men and women actors' network characteristics are similar (indicating comparable access to resources), they may receive *UNR*.

Perceived legitimacy in leveraging networks. Actors may feel and be perceived as less legitimate when they have and use network characteristics in gender role-incongruent ways. For example, women actors may feel more anxious when occupying network positions that enable assertive, independent, and agentic behavior, such as open networks (Brands & Mehra, 2019) or high-status connections. Thus, women may be less likely to engage in the agentic behavior necessary to benefit from such positions (e.g., control information and resource flows, play contacts against one another). Women actors may also feel less legitimate, in general, leveraging their networks due to concerns that requesting career-benefiting resources is unfair, improper, or may jeopardize their relationships (Hewlett, Peraino, Sherbin, & Sumberg, 2010).

Network contacts may view women actors less positively (Brands & Kilduff, 2014) and be less willing to provide them with (un)solicited resources (Burt, 1998). For example, women actors' requests for resources may be honored less frequently than men's because contacts may react negatively to seemingly agentic leveraging behaviors from women (Rudman & Phelan, 2008). Moreover, network contacts may also perceive women as less capable of reciprocating resources due to beliefs that women are less competent, reducing the likelihood of exchange. Even when women defy these beliefs by exhibiting competence and expertise, contacts may attribute women's contributions to their network contacts (e.g., high-status contacts; Deaux & Emswiller, 1974), reducing the likelihood of exchange. In sum, network contacts may interpret network characteristics as signals of actors' competence (and status) and whether they deserve resources and credit for their achievements, and they may interpret these network characteristics differently for men and women actors.

Cognitive activation of contacts. Gender role expectations may influence the network contacts that actors call to mind (i.e., *cognitively activate*) and seek resources from (i.e., *mobilize*; Smith, Menon, & Thompson, 2012). Women tend to be more accurate in recall-

ing networks than men, suggesting women may have an advantage in cognitively activating and managing a wider range of network contacts (Brashears, Hoagland, & Quintane, 2016). However, research suggests high- and low-status people activate different sets of contacts when facing the uncertainty of job threat, such that lower status people call to mind a narrower and less diverse set of network contacts (Smith et al., 2012). Given status differences in the gender hierarchy, men (compared to women) actors facing threats or resource needs may think of a broader and more diverse subset of their network. To the extent that men and women actors think of different subsets of their networks, they may use their networks differently. Further, people tend to recall those higher in organizational hierarchies first (Walker, 1976). Thus, the concentration of women in lower hierarchical positions with more limited access to resources may reduce the frequency with which network contacts think of women as exchange partners.

Resources exchanged. Gender role expectations shape actors' and their contacts' beliefs about the resources men and women actors (should) desire, seek, and receive. Men actors tend to use their network for strategic resources, which directly and quickly benefit their careers (e.g., increased visibility, promotions, compensation, endorsements, introductions to valuable contacts; Bowles, Thomason, & Bear, 2019; Khatlab et al., 2020). Alternatively, women may be more likely to seek resources that benefit their career success more slowly and indirectly. For instance, men actors are less likely to request resources that undermine an "image of competence" (e.g., help, advice, feedback; Lim, Tai, Bamberger, & Morrison, 2020) or risk backlash for not being "man enough" (e.g., flexible work arrangements; Berdahl & Moon, 2013). In contrast, women actors are more likely to seek information about how to navigate workplace obstacles (e.g., discrimination, sexual harassment, work-family conflict; Bowles et al., 2019). Women actors may also feel more comfortable using their networks to gain resources that benefit their development and job performance (Lim et al., 2020) or their workgroup and coworkers (Amanatullah & Morris, 2010).

Network contacts may provide men actors with more or higher quality resources than women actors due to beliefs that men are more competent and, therefore, deserving of rewards. Contacts may also assume that women value different types of resources (cf. Ross & Mirowsky, 1996), leading them to offer fewer or different resources than they provide to men actors. Moreover, regardless of their own beliefs and preferences, initial research finds that network contacts may recommend (sponsor) gender-role-consistent actors for career opportunities (Abraham, 2020).¹ Anticipatory sorting into gender-consistent roles tends to benefit men more than women, given women's predominance in lower status jobs and industries (Fernandez-Mateo & King, 2011). Thus, contacts may provide men actors with resources and opportunities that are more valuable in that they more directly and quickly benefit their careers.

Summary of framework. In our framework, we outline actor and contact mechanisms that explain why UNC and UNR may occur. Our arguments focus primarily on actors initiating network creation and utilization, but network contacts can also initiate these processes (see Figure 1). Professional contexts in which gender is more salient strengthen the influence of gender role expectations on intrapersonal and interpersonal processes, increasing the prevalence of actor and contact mechanisms. Although gender role expectations may have only a modest influence on any one relationship, they shape the many interpersonal

interactions occurring across time and network contacts. Thus, gendered context, actor, and contact mechanisms likely have a meaningful, cumulative impact on men and women actors' network characteristics and returns.

Literature Review

As a basis for our systematic review, we searched for scholarly articles examining gender (keywords: gender, sex, male, female, men, women) and networks (keywords: network*, social capital); we also identified additional studies from article reference sections. We included quantitative studies of working adults (including entrepreneurs and MBA students) that examined how gender relates to network characteristics or influences the associations between network characteristics and career outcomes (broadly defined). Given our focus on network characteristics, we excluded studies of dyads (e.g., individual mentor-mentee or supervisor-subordinate relationships). Our review covers 112 articles spanning 1978-2020 in a range of disciplines (e.g., management, medicine, political science, psychology, sociology). Through our review, nine network characteristics emerged as being most commonly investigated in this literature. We evaluated the evidence for UNC and UNR for each of these characteristics (see Table 1). We distinguish between tie content when it helps to clarify the findings; tie content was categorized as *instrumental* (i.e., ties that convey work- or career-related resources, such as advice or professional influence), *successfully mobilized* (i.e., ties that have been effectively utilized, for example collaborators on a completed work project, publication, or patent), *expressive* (i.e., ties that convey social or emotional resources, including friendship or emotional support), *multiplex* (i.e., ties that exchange both instrumental and expressive resources), and *general* (i.e., ties through which unspecified resources flow, including communication, email exchanges, or those one knows).

Our theorizing suggests that the gendered professional context, in conjunction with actor and contact mechanisms, contribute to men and women actors' differential *creation* and *use* of four network characteristics: Compared to women actors, men actors likely have more of and receive more returns from (a) same-gender contacts, (b) men contacts, (c) high-status contacts, and (d) open networks, which confers *compounding (dis)advantage* from both UNC and UNR. For these four characteristics, we provide the theoretical rationale for compounding disadvantage and evaluate the evidence for UNC and UNR explanations for *each* network characteristic. We also briefly present the research evidence for the remaining five network characteristics. We direct readers to the online supplement for detailed theoretical rationales and findings for these four network characteristics, as well as the findings for *each article* included in our review (organized by type of network characteristic and tie content). In Table 2, we also summarize the state of evidence for UNC and UNR for all nine network characteristics.

Proportion of Same-Gender Contacts

Theoretically-derived expectations. The fundamental human tendency for people to associate with those similar to themselves (called *homophily*; McPherson, Smith-Lovin, & Cook, 2001) suggests that both men and women likely have more same-gender contacts than expected by chance. Same-gender actors and contacts may experience greater liking and commonality with each other (Tsui & O'Reilly, 1989), which may heighten their motivation

Table 2
Overview of Evidence for Gender Differences, UNC, and UNR

Proportion of Same-Gender Contacts	<i>See Online Supplement Table 1a-e</i>
Gender Differences: Strong Support [47]	
<i>Studies not considering availability [40]</i>	
<ul style="list-style-type: none"> - Men have a higher proportion of same-gender contacts than women (37/40) - Women have mostly opposite-gender <i>instrumental</i> (19/21) and <i>successfully mobilized</i> (3/4) contacts - Women have mostly same-gender <i>general</i> contacts (6/9) - Men have mostly same-gender contacts regardless of network content (39/39) 	
<i>Studies accounting for availability [15]</i>	
<ul style="list-style-type: none"> - Men (5/10) and women (8/10) form more same-gender contacts than available in the context - Exception: Men develop same-gender <i>electronic</i> communication contacts in proportion to availability (3/3) 	
UNC: Initial Support [3]	
<i>Studies not considering availability [2]</i>	
<ul style="list-style-type: none"> - Positive associations with rank achieved and entrepreneurs' business size (2/2) 	
<i>Studies accounting for availability [1]</i>	
<ul style="list-style-type: none"> - Null association between <i>instrumental</i> network and bonuses (1/1) 	
UNR: Initial Mixed Evidence [6]	
<i>Studies not considering availability [4]:</i>	
<ul style="list-style-type: none"> - AGAINST: <i>Successfully mobilized</i> networks predict productivity for men and women (3/3) - FOR: Benefited men's salaries and hurt women's salaries (1/1) 	
<i>Studies accounting for availability [2]:</i>	
<ul style="list-style-type: none"> - FOR: Hurt men's salaries but no impact on women's salaries (1/1) - AGAINST: No association between <i>instrumental</i> network and bonuses (1/1) 	
Proportion of Men Contacts	<i>See Online Supplement Table 2a-e</i>
Gender Differences: Strong Support [41]	
<ul style="list-style-type: none"> - Men have a higher proportion of men in their networks than women (36/41) 	
UNC: Mixed Evidence [12]	
<ul style="list-style-type: none"> - FOR: Positive association with income (3/4) and perceived external mobility (1/1) - AGAINST: Null association with other outcomes (e.g., work satisfaction, early promotions; 3/4) or entrepreneurial success/performance (3/3) 	
UNR: Initial Support [4]	
<ul style="list-style-type: none"> - Helps men's (2/3) and hurts women's (3/3) productivity in <i>successfully mobilized</i> networks - Similarly related to men and women entrepreneurs' performance (1/1) 	
Contact Status	<i>See Online Supplement Table 3a-e</i>
<i>Studies Examining Structural Status</i>	
Gender Differences: Emerging Evidence Against in Most Networks [8]	
<ul style="list-style-type: none"> - No difference in how well-connected men and women's contacts are in most networks (4/6) - Exception: Women have more well-connected <i>successfully mobilized network</i> contacts (2/2) 	
UNC: Insufficient Evidence [1]	
<ul style="list-style-type: none"> - Having more well-connected <i>successfully mobilized network</i> contacts hurt productivity (1/1) 	
UNR: Insufficient Evidence [1]	
<ul style="list-style-type: none"> - Although well-connected <i>successfully mobilized network</i> contacts reduced productivity for both men and women, they reduced men's productivity slightly more (1/1) 	

(continued)

Table 2 (continued)

Contact Status	See Online Supplement Table 3a-e
<i>Studies Examining Relative Status</i>	
Gender Differences: Mixed Evidence [5]	
- FOR: Women's <i>successfully mobilized</i> network contacts were relatively higher in status (1/1)	
- AGAINST: No difference for <i>expressive</i> (1/1) and <i>general</i> (1/1) networks	
UNC: Insufficient Evidence [2]	
- No support for performance (1/1) or work satisfaction (1/1)	
UNR: Insufficient Evidence [2]	
- In <i>general</i> networks, improves job performance (1/1) and income (1/1) for men and is unrelated for women	
<i>Studies Examining Average Status</i>	
Gender Differences: Emerging Evidence Against [12]	
- Men and women are similar regardless of tie content or average status indicator (10/12)	
UNC: Insufficient Evidence [2]	
- AGAINST: No support in <i>successfully mobilized</i> networks for productivity (2/2)	
UNR: Insufficient Evidence [2]	
- AGAINST: No support in <i>successfully mobilized</i> networks for productivity (2/2)	
Openness	See Online Supplement Table 4a-e
Gender Difference: Emerging Evidence Against [18]	
- Men and women actors have similar network openness (14/15) and men and women's contacts have similar network openness (2/2)	
- Exception: Men have more open <i>successfully mobilized</i> networks (3/4)	
UNC: Mixed Evidence [9]	
- AGAINST: No support for <i>most</i> networks for influence, performance, promotions (6/6)	
- FOR: <i>Successfully mobilized</i> network openness improves productivity (3/3)	
UNR: Mixed Evidence [8]	
- FOR: Actors' <i>general</i> network openness improves senior men's and is unrelated to women's and junior men's early promotions (1/1); actors' small, closed general networks helped women's rank and early promotions (2/2); contacts' <i>general</i> network openness helps women's job placement and early promotions (2/2)	
- AGAINST: Actors' <i>instrumental</i> (3/4) and <i>expressive</i> (2/2), as well as actors' (2/3) and contacts' (1/1) <i>successfully mobilized</i> network openness offers similar returns	
Size	See Online Supplement Table 5a-e
Gender Difference: Emerging Evidence Against [69]	
- Men and women have similar size networks (44/69)	
UNC: Mixed Evidence [23]	
- Similar number of studies found evidence for (12/23) and against (13/23) UNC	
UNR: Mixed Evidence for UNR [21]	
- FOR: When differences were found (9/15), men tend to derive higher returns (8/9)	
- AGAINST: Similar returns for most networks (13/21)	
Closeness Centrality	See Online Supplement Table 6a-e
Gender Differences: Initial Evidence Against [7]	
- Most studies report no evidence of gender differences (6/7)	
UNC: Insufficient Research [1]	
- Positive/null association with promotions/perceived influence based on network boundary (1/1)	
UNR: Insufficient Research [1]	
- Results varied based on network boundary (1/1)	

(continued)

Table 2 (continued)

Tie Strength	<i>See Online Supplement Table 7a-e</i>
Gender Differences: Mixed Evidence [22]	
<ul style="list-style-type: none"> - AGAINST: Similar average tie strength for <i>instrumental</i> (9/10) and <i>general</i> (7/11) networks - FOR: Men had stronger expressive network ties (3/3) and longer tie duration in <i>successfully mobilized</i> (2/2) and <i>general</i> (2/3) networks 	
UNC: Emerging Evidence Against [7]	
<ul style="list-style-type: none"> - No support across multiple measures of tie strength (7/7) - Exception: Longer tie duration in <i>successfully mobilized</i> and <i>general</i> networks was positively related to citation count (1/1), career satisfaction (1/1), and rank (1/1) 	
UNR: Mixed Evidence [4]	
<ul style="list-style-type: none"> - AGAINST: Similar benefits (2/4) or no impact (2/4) in half of studies - FOR: When differences are found, women benefited (2/4) and men were harmed (1/4) 	
Proportion Kin	<i>See Online Supplement Table 8a-e</i>
Gender Differences: Strong Evidence For [16]	
<ul style="list-style-type: none"> - Women tend to have a higher number and proportion of kin ties in their networks (12/16) 	
UNC: Insufficient Research [3]	
<ul style="list-style-type: none"> - Null (2/3) or negative (1/3) association with career outcomes 	
UNR: Insufficient Research [2]	
<ul style="list-style-type: none"> - FOR: Harms women (not men) entrepreneurs' odds of starting a new business (1/1) - AGAINST: No association with workforce participation for men or women (1/1) 	
Network Diversity	<i>See Online Supplement Table 9a-e</i>
Gender Differences: Mixed Evidence [28]	
<ul style="list-style-type: none"> - FOR: Evidence that women have greater expertise (3/9), demographics (3/7), and relationship type (4/7) network diversity - AGAINST: Evidence of no differences for location (8/10), expertise (6/9), demographic (4/7), and relationship type (4/7) network diversity 	
UNC: Initial Evidence Against [8]	
<ul style="list-style-type: none"> - No support for location (6/6), demographic (1/1), or relationship type (1/1) network diversity 	
UNR: Mixed Evidence [6]	
<ul style="list-style-type: none"> - FOR: Expertise network diversity yielded greater returns (career longevity, external funding) for men than women (2/2) - AGAINST: Location (2/3) and relationship type (1/1) network diversity did not predict career success for men or women 	

Note: Square brackets denote the number of studies examining gender differences, UNC, and UNR for each network characteristic. Within parentheses we list the number of studies that support a finding / the total number of studies that examine a relationship.

for and ease of resource exchange.² Thus, if men and women are equally available as potential contacts and have equal access to resources within a context, having more same-gender contacts likely provides similar career-benefiting resources to men and women (Ridgeway & Smith-Lovin, 1999).

However, men are disproportionately represented in many professional contexts (e.g., industries, organizations, upper echelons). In such contexts, both men and women actors likely develop more relationships with men because men are more available and are also seen as more valuable potential contacts (e.g., higher ranking). In such contexts, same-gender

contacts tend to be motivated to provide (un)solicited resources to help men actors maintain high status and women actors achieve higher status (Greenberg & Mollick, 2017). Thus, overall, due to status differences and homophily, men actors likely have a higher proportion of same-gender contacts, yielding UNC. Further, given men's greater perceived value and access to resources in many contexts, same-gender contacts are likely capable of providing men actors with better access to career-benefiting resources than women actors, yielding UNR. Thus, same-gender contacts likely result in compounding advantage for men and compounding disadvantage for women.

Empirical findings. Forty studies examined the proportion of same-gender contacts, without accounting for the availability of men and women in the professional context. These studies found that men nearly always had a higher proportion of same-gender contacts than women, regardless of tie content (e.g., Aten, DiRenzo, & Shatnawi, 2017; Solano & Rooks, 2018). Women's instrumental and successfully mobilized networks were composed of mostly opposite-gender (men) contacts. However, women's general networks are composed mostly of same-gender contacts (Burt, 2019; Ibarra, 1992). Supporting UNC, two studies found the proportion of same-gender general contacts was positively related to career success (e.g., rank; van Emmerik, 2006; entrepreneurs' business size, Solano & Rooks, 2018).

Fifteen studies accounted for one aspect of the professional context—the availability of men and women within the organization—enabling researchers to determine whether the proportion of same-gender contacts in men and women's networks is driven by actors' and (potential) contacts' "choices" to connect to same-gender contacts (McPherson & Smith-Lovin, 1987).³ After adjusting for availability, both men and women tend to have more same-gender connections than would be expected by chance (e.g., Bevelander & Page, 2011; Burt, 2019; Mehra, Kilduff, & Brass, 1998). The only exception is that men tended to connect with men and women in proportion to their availability in their electronic communication networks (i.e., email and enterprise social media; Di Tommaso, Gatti, Iannotta, Mehra, Stilo, & Velardi, 2020; Yang, Chawla, & Uzzi, 2019). These findings suggest that a lower availability of women in organizations explains why women often have networks with mostly opposite-gender contacts.

Evidence regarding UNR for the proportion of same-gender contacts is mixed. Three studies suggest men and women actors with similar proportions of successfully mobilized same-gender contacts receive similar productivity benefits (Ghiasi, Lariviere, & Sugimoto, 2015; McMillan, Shockley, & Carter, 2018; Whittington, 2018). Yet men and women actors also benefit from having some opposite-gender contacts; having networks composed of *only* same-gender successfully mobilized contacts hurt both men's and women's productivity (Ghiasi et al., 2015). Additionally, the (availability-adjusted) proportion of same-gender instrumental contacts was positively related to bonuses for low-ranking and negatively related to bonuses for high-ranking men and women (Ertug, Gargiulo, Galunic, & Zou, 2018). Thus, rank may play a larger role than gender in explaining how same-gender contacts impact bonuses (cf. Ridgeway & Smith-Lovin, 1999). In contrast, two studies examining salary find support for UNR; however, it remains unclear which gender benefits. A higher proportion of same-gender LinkedIn contacts was associated with higher salaries for men and lower salaries for women (Aten et al., 2017). However, the (availability-adjusted) proportion of same-gender contacts in MBA students' email networks was associated with lower salaries for men and was unrelated to salaries for women in their first post-MBA jobs (Yang

et al., 2019). Taken together, the existing literature supports our theoretically-derived expectations for UNC but provides equivocal evidence for UNR.

Proportion of Men Contacts

Although proportion of men contacts and same-gender contacts are the same empirically for men, these two network characteristics are conceptually distinct. As described previously, being a man conveys status and thus value as a network contact, making the proportion of men contacts one way of conceptualizing access to a type of high-status contact. Thus, the proportion of men more directly assesses an actor's access to high-status contacts regardless of the actor's gender, whereas same-gender contacts better captures access to contacts who share common gender identity with an actor (homophily). Comparing findings regarding both the proportion of men and same-gender contacts allows us to begin disentangling the effects of homophily and contact status (conveyed by gender status beliefs) on men and women actors' career outcomes.

Theoretically-derived expectations. We expect men actors to have a higher proportion of men contacts. Aided by homophily and men's perceived status and competence, men (more than women) actors likely expect their relationship development attempts with men to be successful. Likewise, men contacts may be more likely to initiate and/or reciprocate relationship development attempts by men (compared to women) actors. A higher proportion of men contacts likely provides more career-benefiting resources (given men's higher status roles), yielding UNC that favors men. Moreover, while we expect a higher proportion of men to yield benefits for both men and women, men (compared to women) actors likely receive better career success returns from the same proportion of men contacts given that people may provide those similar to themselves with more assistance (McPherson et al., 2001) and view men as more deserving of and capable of reciprocating rewards (Ridgeway, 1997). Thus, we expect UNR benefitting men.

Empirical findings. Men have a higher proportion of men in their networks compared to women (36/41 studies), and the proportion of men in one's instrumental network was positively related to income (Aten et al., 2017; Markiewicz, Devine, & Kausilas, 2000; Zeltzer, 2020) and external mobility (Spurk, Meinecke, Kauffeld, & Volmer, 2015). However, the proportion of men was unrelated to work satisfaction (Markiewicz et al., 2000), early promotions (Burt, 1998), and entrepreneurial success (Burt, 2019; Chen, Tan, & Tu, 2015; Renzulli, Aldrich, & Moody, 2000). Thus, evidence for UNC for proportion of men contacts depends on the career success outcome.

Regarding UNR, research has primarily examined *successfully mobilized networks*, finding that a higher proportion of men contacts was positively related to productivity for men (Ghiasi et al., 2015) but negatively related to productivity for women (McMillan et al., 2018; Whittington, 2018). However, men and women entrepreneurs received similar returns from the proportion of men in their instrumental networks (Chen et al., 2015). Taken together, there is initial evidence of a functional difference for men and women: Specifically, men actors had a higher proportion of men contacts in their successfully mobilized networks, which increased productivity for men actors. Alternatively, women actors tended to have a lower proportion of men contacts; moreover, a higher proportion of men successfully mobilized contacts was

associated with lower productivity for women (McMillan et al., 2018; Whittington, 2018). Thus, having a higher proportion of men in their successfully mobilized networks benefited men's productivity, whereas having a *lower* proportion of men (or a higher proportion of women) in their successfully mobilized networks benefited women's productivity.

Contact Status

Theoretically-derived expectations. Compared to women, men actors likely have a higher proportion of high-status contacts in their networks, providing increased access to career-benefiting resources and, ultimately, greater career success. Beliefs that men are competent, are career-oriented, and have more or better expertise and resources bolsters men actors' confidence in approaching and developing relationships with high-status contacts. High-status contacts may be more receptive to relationship development attempts from men actors due to beliefs that men (more so than women) could exchange mutually beneficial resources. Moreover, to the extent that women disproportionately occupy lower ranks in an organization, the average woman's opportunities for interacting with people at higher ranks are constrained, reducing the likelihood of developing relationships with as many high-status contacts as men. Women also may be less openly confident and assertive than men (due to potential backlash; Rudman & Phelan, 2008), which may reduce their willingness to reach up to form relationships with high-status contacts.

Furthermore, men actors are more likely than women actors to receive better career success returns from high-status contacts. Men are likely to feel more confident and comfortable when a resource need or threat arises given their higher status (Smith et al., 2012), resulting in men cognitively activating (i.e., thinking of) and mobilizing more high-status contacts for (career-benefiting) resources compared to women. Moreover, high-status contacts likely perceive men as more competent, legitimate, and deserving of rewards (Heilman, 2001; Ridgeway, 1997), increasing the likelihood that men receive greater returns from these contacts. In contrast, contacts and third parties may attribute women's accomplishments to their high-status contacts (e.g., Deaux & Emswiller, 1974), whereas high-status contacts signal to others that men actors are competent or have access to high-quality resources. Thus, high-status contacts enhance the desirability of men actors as exchange partners but may detract from women actors' reputations at worst or offer fewer benefits at best, contributing to UNR.

Empirical findings. Contact status is conceptualized in three ways in the existing literature: structural, relative, and average status (see Table 1). First, research examining contacts' *structural status* in successfully mobilized networks finds women tend to have more well-connected contacts across two samples of STEM researchers' co-patent and publication networks (Ghiasi et al., 2015; Whittington, 2018). Having contacts who are themselves well-connected diminished productivity (perhaps because such network contacts have divided attention or act as bottlenecks), hurting men slightly more than women (Whittington, 2018). Six studies investigated contacts' structural status in other types of networks, finding that men and women have similarly well-connected contacts (e.g., Di Tommaso et al., 2020; Ibarra, 1992), suggesting UNC is an unlikely explanation; however, none of these studies linked structural status to career outcomes, leaving open the possibility of UNR for these types of networks.

Second, we found mixed evidence for gender differences in *relative status*: One study found women's successfully mobilized contacts were of a higher relative status than men's (Whittington, 2018). Men and women's network contacts appear to be of similar relative status in their expressive and general networks, yet no discernible pattern emerged for multiplex and instrumental networks (e.g., Markiewicz et al., 2000; Ng & Chow, 2005). Furthermore, only two studies examined relative status in relation to career outcomes, finding little support for UNC (Markiewicz et al., 2000; Ng & Chow, 2005). Only two studies (both in Chinese contexts) examined UNR, finding that general network contacts' relative status was positively related to job performance (Ng & Chow, 2005) and income (Wang, Zhang, & Ni, 2015) for men and unrelated for women.

Third, we found that men and women tend to have network contacts with similar *average status*, regardless of tie content and status indicator (e.g., rank, perceived influence, occupational status; 10/12 studies). As such, UNC does not appear to be a viable explanation at this point. Two studies have examined UNR in successfully mobilized networks, finding that men and women receive similar returns from their successfully mobilized network contacts' average status. However, whether average status is beneficial (i.e., contacts' average citation count, number of publications; Jadidi, Karimi, Lietz, & Wagner, 2018; Whittington, 2018) or harmful (i.e., contacts' average years of productivity; Whittington, 2018) differed by the status indicator.

Openness

Theoretically-derived expectations. Compared to women, men actors likely have more *open networks*. Men may feel more legitimate when performing seemingly agentic behaviors, such as initiating and maintaining relationships outside of their existing social circle or brokering between disconnected people or groups. However, women may feel more legitimate engaging in seemingly communal behaviors, such as bringing disconnected contacts together, which may create more tight-knit or dense networks. Similarly, network contacts may respond more positively to men and women actors when they engage in such gender-consistent interpersonal behaviors, reinforcing men's and women's tendencies to build open versus closed networks.

Even when men and women actors have similarly open networks, men actors likely receive greater career success returns from network openness than women actors. Gender role expectations enhance men actors' feelings of legitimacy in network positions that facilitate agentic behaviors (such as brokerage), which may embolden men to ask for more (career-benefiting) resources. Men may also think of and mobilize more open subsets of their networks. In contrast, women who occupy open network positions may feel more anxious (Brands & Mehra, 2019), undermining their engagement in brokerage or leveraging behaviors. If women actors are of lower status in their organization/profession, they may also be less likely to cognitively activate and mobilize a broad subset of their networks (Smith et al., 2012), reducing their likelihood of brokering career-benefiting resources from disconnected people or groups. Finally, contacts may perceive men actors as more legitimate in open network positions and be more willing to provide them with more and better resources but may not view women actors as legitimate brokers in their own right, preferring to work with women brokers sponsored by a third party (Burt, 1998). Thus, compared to women, men actors may be more likely to reap rewards from open networks.

Empirical findings. Men and women tended to have similarly open instrumental, expressive, multiplex, and general networks (14/15 studies). Thus, for these networks, gender differences in openness do not appear to explain differences in career outcomes. However, three out of four studies examining *successfully mobilized* networks found that men tend to have more open networks than women (Ghiasi et al., 2015; Jadidi et al., 2018; Whittington, 2018). Such openness provided career longevity (Lutter, 2015), more patents, (Whittington, 2018), and more citations (Jadidi et al., 2018), offering initial evidence that UNC for openness in successfully mobilized networks may contribute to career inequality.

Evidence for UNR also differed by type of network. For instrumental and expressive networks, men and women received similar returns (e.g., influence, Brass, 1985; business survival, Zhao & Burt, 2018) and a lack of returns (e.g., early promotion, Burt, 1998; performance, Brands & Mehra, 2019), suggesting that UNR from openness in these networks is not a likely explanation for career inequality. Successfully mobilized network openness provides similar benefits to men's and women's productivity (i.e., number of citations; Jadidi et al., 2018) and career longevity (Lutter, 2015). While open networks benefited men and women similarly, Lutter found evidence of a "women's closure penalty," such that women's career longevity suffers more than men's from having a dense overall network. Moreover, general network openness was unrelated to early promotions for women and entry-level men, but resulted in quicker promotions for senior men (Burt, 1998). When taking into account network size, women benefited from small, less open general networks (Burt, 1998; Yang et al., 2019).

In addition, three studies examine how men and women may differentially benefit from their *contacts' network openness*. Men's and women's network contacts tend to have similarly open networks openness (Burt, 1998; Jadidi et al., 2018), suggesting that UNC may not be in operation. While contacts' successfully mobilized network openness provided similar returns (Jadidi et al., 2018), both studies examining general networks found evidence of UNR. In a sample of MBA students, having strong contacts who themselves have open (non-overlapping) networks was positively associated with obtaining a higher ranking job for women but not for men (Yang et al., 2019). Additionally, Burt found that when women and entry-level (but not senior-level) men had an open yet largely overlapping network with (only) one of their contacts (i.e., network *hierarchy*), they received early promotions. Thus, there is initial evidence of UNR for contacts' network openness such that women may "borrow" openness advantages from their contacts.

Other Network Characteristics

Five other network characteristics—network size, closeness centrality, tie strength, proportion of kin, and network diversity—have also been commonly investigated in relation to men's and women's career success (see the online supplement for greater theoretical and empirical detail).

Size. For most types of networks, men and women appear to have a similar number of contacts (44/69 studies), and when there were gender differences, it was unclear whether men or women had larger networks. Network size tends to be positively associated with career success. However, evidence is mixed regarding UNC and UNR for most networks, with the clearest findings suggesting that successfully mobilized network size appears to provide

similar benefits to men and women (Jadidi et al., 2018; Whittington, 2018). In eight of the nine studies in which gender differences were found, men derived higher returns than women (e.g., Yang et al., 2019).

Closeness centrality. Six of seven studies suggest that men and women have similar closeness centrality. One study examined UNC and UNR, finding that gender differences in closeness centrality and whether closeness centrality was unrelated or positively related to promotions and perceived influence depended on the network boundary (e.g., department versus organization; Brass, 1985). This research is too limited to draw conclusions about UNC or UNR.

Tie strength. Across a variety of measures of tie strength (e.g., emotional closeness, interaction frequency), men and women did not differ in average instrumental (9/10 studies) or general (7/11 studies) network tie strength. However, men had stronger expressive ties than women (3/3 studies). Seven of these studies linked average tie strength to career success and found no evidence of UNC. Representing the only evidence of UNC, men had longer average tie duration in successfully mobilized (2/2 studies) and in general networks (2/3 studies), and these differences were positively related to citation impact (Jadidi et al., 2018), career satisfaction (van Emmerik, 2004), and rank (van Emmerik, 2006). Thus, there is emerging evidence against UNC (except for tie duration). UNR findings for average tie strength were mixed, showing evidence of equal returns, as well as benefits to women or harm to men (van Emmerik, 2004; Jadidi et al., 2018).

Proportion of kin. Women had more kin in their networks than men (12/16 studies), but only three studies linked proportion kin to career outcomes: A higher proportion of kin was negatively related to entrepreneurs' likelihood of starting a business (UNR not examined; Renzulli et al., 2000) and negatively related to entrepreneurs' business size for women but unrelated for men (Chen et al., 2015). Further, proportion of kin was unrelated to workforce participation for men and women (Giudici & Widmer, 2017). Thus, gender differences in kin composition were robust, and some evidence suggests a higher proportion of kin may be detrimental for entrepreneurs, but more research is needed to determine how kin ties relate to employees' career outcomes.

Network diversity. Network diversity is conceptualized in terms of relationship types (coworker, friend, neighbor), contacts' location (affiliation, department), demography (age, race-ethnicity), and expertise (occupation, functional area). Emerging evidence suggests men and women do not differ in relationship type (4/7 studies), location (8/10 studies), demographic (4/7 studies), or expertise diversity (6/9 studies). The eight studies examining UNC found no support. Of the six studies examining UNR, two found no support for UNR for location diversity, whereas two found evidence of UNR for expertise diversity such that men receive greater returns than women (e.g., Lutter, 2015).

Review Summary

Our review revealed that men and women's networks appear to have a similar structure (i.e., *openness, size, closeness centrality, contact average and structural status*) but differ in terms of composition (i.e., *proportion same-gender, men, and kin contacts*); sometimes these

differences helped explain career inequality (see Table 2). Specifically, we found that the *proportion of same-gender contacts* in men's and women's successfully mobilized networks appear to contribute to career inequality via UNC. Further, women tend to have a higher *proportion of kin contacts*, yet the consequences for career success have been largely unexplored. Initial evidence (i.e., two studies for each characteristic) also finds evidence of UNR for a few network characteristics. Specifically, men actors tend to benefit more than women from the same degree of general network *openness* and *contact relative status*, whereas women tended to benefit more from their contacts' general network *openness*. Finally, for *network size* neither UNC nor UNR are supported, whereas both were supported for the *proportion of men contacts*.

Discussion

Since Ibarra (1993) called for research to investigate how men's and women's networks differ and whether those differences matter for career success, the field has primarily investigated gender differences in networks and given less attention to whether differences matter for career success (i.e., only 38% of studies linked network characteristics to career success via UNC or UNR). Our review offers a path forward for this burgeoning research area by presenting a conceptual framework that deepens prior explanations for the role of networks in men's and women's career inequality and summarizes the extant evidence. Below, we first discuss implications for practice based on what is currently known; then we present an agenda for future research that provides multiple avenues for addressing the fundamental questions of *how* and *why* specific network characteristics affect career inequality for men and women.

Implications for Practice

Professional contexts, actors, and contacts all likely contribute to UNC and UNR. Thus, to facilitate career equality in workplaces, we advocate for a multipronged approach that addresses all three factors. To begin, organizational decision-makers should be aware of both the opportunities afforded to employees for network creation and utilization, as well as the cultures that emerge from gender (im)balanced professional contexts in occupations, organizations, departments, and hierarchies. Talent acquisition and management practices can be used to achieve gender-balance in such contexts, especially in periods of organizational growth. However, gender parity is a necessary (yet insufficient) condition for providing men and women with equal opportunities to develop and utilize network connections or for shaping cultures that promote inclusion and prevent backlash for violating gender roles.

Many organizational design and HR decisions impact network creation and utilization; thus, leaders should make decisions that rectify, as opposed to create or reinforce, UNC and UNR (Methot, Rosado-Solomon, & Allen, 2018). For instance, organizations may offer networking events during normal work hours to facilitate connections among all employees, including those who might be excluded if events took place after hours. Organizations may also offer benefits that support employees' personal responsibilities (e.g., on-site childcare, eldercare, paid vacation), enabling them to commit more time and effort to professional activities, which may influence others' opinions about their attractiveness as a network contact.

Organizations may also incorporate training programs that facilitates actor and contacts' network creation and utilization into their leadership development efforts (Cullen-Lester, Maupin, & Carter, 2017). Training programs may help women and men learn what constitutes an effective network, identify effective strategies to change their networks, and build confidence in and comfort with professional networking. They may also provide a forum for women to discuss perceived barriers to developing and deriving valuable resources from connections, which would educate men and women throughout the organization about network-related challenges and generate conversations that identify context-specific solutions (Cullen-Lester, Woehler, & Willburn, 2016).

Finally, leaders and decision-makers, who have the power to allocate resources that directly impact men's and women's career success, should be trained to accurately assess and rely upon employees' merit when allocating resources as opposed to relying on gender role expectations. Furthermore, decision-makers should be proactive to ensure women have equal access to work- and career-benefiting resources—i.e., challenging, mission-critical, and visible roles and developmental opportunities—even if they are less likely to openly advocate for them.

Future Research Directions

Our review revealed the need for future research to adopt a more targeted and systematic evaluation of the specific network characteristics that underlie gender differences in career success and whether they contribute to career inequality via UNC, UNR, neither, or both explanations. Practical interventions will remain limited to the general guidance provided above until researchers move beyond assessing only gender differences in networks to examining *how* networks factor into men's and women's career outcomes and *why* UNC and UNR occur for specific network characteristics (i.e., evaluate specific professional context, actor, and contact mechanisms). In the absence of such guidance, well-meaning attempts to address network-related inequalities may be ineffective or, even worse, may exacerbate inequality. Thus, future research needs to systematically address questions of “*How do network characteristics factor into career inequality for men and women?*” and “*Why do UNC and UNR exist?*”

How Do Network Characteristics Factor Into Career Inequality for Men and Women?

To clarify whether UNC, UNR, neither, or both explanations are in operation for any given network characteristic, we suggest four key research directions. First, more empirical research is needed to expand upon the initial insights that emerged from our review (see insufficient, initial, emerging, and mixed findings in Table 2). For example, future research should replicate and expand upon the two studies (each) that have found that men actors tend to benefit more from their own general network *openness*, whereas women tend to benefit from general network *contacts' openness*. This research is important because these findings are consistent with Burt's (1998) “legitimacy” arguments that women may need to borrow social capital from others to gain access to the same degree of resources as men and that women may benefit from a small, densely connected group of general network

contacts who themselves have open networks outside of this “coalition.” However, given that this conclusion is based on so few studies, future research must ascertain whether this is a viable alternative network-based pathway for women to achieve comparable career success to that of men.

Second, our review found evidence of both UNC and UNR, yet these explanations were often examined in separate studies, making it difficult to infer whether one or both explanations contribute to career inequality. Only 25 studies (assessing various network characteristics) provide evidence relevant to both UNC and UNR.⁴ Even within this subset of the literature, few studies theorized about the interplay between UNC and UNR explanations or adopted methodological or statistical approaches that allowed researchers to examine both the moderation and mediation pathways in one analytic model (Frear, Paustian-Underdahl, Heggstad, & Walker, 2019; Lin, 2001). Such an approach is necessary to clarify when *only UNC or UNR* is functioning (i.e., many studies do not rule out the other explanation). Further, when UNC and UNR operate together, they may yield either *compounding (dis)advantage* (different levels of a network characteristic and different returns jointly exacerbate career inequality) or *functional differences* (having different levels of a network characteristic yield similar career outcomes for men and women)—which have different practical implications.

Where *compounding (dis)advantage* is identified, organizations may need to take action to improve equal opportunities for both network creation and network utilization. Where *functional differences* are identified, men and women have alternative paths to career success and organizational intervention may be less critical. For example, for the *proportion of men contacts* in successfully mobilized networks, UNC and UNR combine to counteract or neutralize one another such that men benefit because they have more men contacts and women benefit because they have fewer men contacts in their successfully mobilized networks (McMillan et al., 2018; Whittington, 2018). The proportion of kin is another network characteristic that may result in compounding (dis)advantage or functional differences for men and women. Women tend to have a higher *proportion of kin contacts*; however, the consequences for career success need to be explored.

Third, future research should investigate specific network characteristics in relation to a range of objective (e.g., salary, promotions) and subjective (e.g., perceived progress toward fulfilling career aspirations) career outcomes. Whereas research on objective career success outcomes (e.g., income, bonuses) is necessary to evaluate the extent to which networks contribute to differences in economic opportunity, research is also needed to clarify how networks enable people to achieve the types of careers they value. For example, promotions are a measure of objective career success, yet workers may consider upward, lateral, and even downward career moves as advancement toward achieving their career aspirations (cf. Bowles et al., 2019).

Fourth, future research should clearly articulate the theoretical rationales for why specific network characteristics may differ for men and women and may differentially impact men’s and women’s career success. For instance, rather than treating “networks” as a global concept, researchers might draw on our explanations for why specific network characteristics relate to career success (see Table 1). Scholars may also theorize about the role of more nuanced aspects of men’s and women’s networks that are obscured by many common network measures. Network characteristics like network size, average tie strength, and average

contact status may lack sufficient nuance to capture the aspects of networks that contribute to career success. Instead of averages, researchers may theorize about and measure the distributions of different types of ties (e.g., strong versus weak ties) and contacts (e.g., at different organizational levels).

We also encourage researchers to investigate multiple network characteristics simultaneously. Scholars might start by disentangling the theoretically-linked concepts of gender and status by evaluating the relative influence of proportion of high-status and proportion of men contacts on career success. Scholars may also investigate how more specific types of network contacts contribute to career inequality. For example, the ease of developing relationships with same-gender contacts may differ depending on contact status (e.g., rank). Some research suggests that when women are concentrated at lower organizational ranks, high-ranking women may be less likely to “reach down” to lower ranking women (Duguid, 2011), and lower ranking women may be more skeptical of high-ranking women and less likely to identify with them or view them as role models with legitimate authority (Ely, 1994). In contrast, recent work found that in municipalities where women are reelected into power, the number of women occupying top- and mid-level positions within public organizations increased (e.g., Arvate, Galilea, & Todescat, 2018), suggesting women in such situations may reach down. These findings highlight the need to investigate network characteristics that capture both contacts' gender and status in a variety of gendered professional contexts. Finally, future research may also investigate how network characteristics that capture different portions of one's network operate simultaneously.⁵ For example, women may benefit from building small, interconnected networks with contacts who themselves have open networks outside of this coalition (Yang et al., 2019). Such a conceptualization is not fully captured by measuring size or density (i.e., the average interconnectedness of an actor's contacts) alone and may be better captured by the number of open/closed triads in actors' and their contacts' networks.

Why Do UNC and UNR Exist?

As evidenced by our review, professional contexts, actors, and contacts all contribute to career inequality, but it is unclear which aspects of professional contexts and which actor and contact mechanisms drive these differences and how these mechanisms work in tandem.

Professional context. Our framework highlights how professional contexts—the gender composition and cultures of occupations, organizations, and aspects of organizational design (e.g., shared group affiliations, job functions, offices, business units, hierarchies)—shape network creation and utilization. For example, research investigating the proportion of same-gender contacts provides evidence that gender composition within departments, organizations, or industries impacts network creation. Future research should further examine how these aspects of professional context impact men's and women's network creation and utilization to identify leverage points for addressing network-based career inequality. One way to evaluate the role of the professional context is to compare industries, organizations, organizational hierarchies, vocations, or job roles that are male-dominated, gender-balanced, or female-dominated, each of which provides different opportunities for and cultures that influence network creation and use. For example, recent research examining Medicare patient referral networks found that a more gender-balanced mix of referring physicians—but not specialists—would reduce the gender pay gap among specialists given current patient referral patterns (Zeltzer, 2020).

In addition, multisite comparisons (e.g., similarly sized hospitals) would enable researchers to identify key contextual conditions (e.g., organizational design and HR practices) that mitigate or exacerbate gender differences in network characteristics or returns. Finally, national culture may impact the expression of and adherence to gender role expectations and interpersonal interactions within and between genders; thus, cultural contexts are boundary conditions impacting UNC and UNR that should be considered in future research.

Actor and contact mechanisms for UNC. Where there is evidence of UNC, future research should empirically evaluate each of the actor/contact mechanisms: (1) work and familial role expectations, (2) perceived utility as a contact, and (3) gender-role-consistent behaviors. For example, research needs to assess whether actors' and contacts' work and familial role expectations predict gender differences in the frequency or amount of men's and women's networking behaviors and whether such differences contribute to differences in their network characteristics. In addition, future research should evaluate whether actors and network contacts perceive men and women to be more or less legitimate or useful network contacts and whether such beliefs are associated with differences in men's and women's network characteristics. Researchers may also investigate which gender role expectations drive the perceived utility of men versus women as network contacts [e.g., beliefs about how men and women (should) prioritize their work and careers, perceived competence, expertise, or status]. Moreover, future research may evaluate whether actors, contacts, and potential contacts (i.e., third parties) perceive network creation behaviors (e.g., networking behaviors, brokerage orientations, self-promotion) as more appropriate for men or women actors as well as the impact these perceptions and expectations have on the network characteristics men and women develop (cf. Floyd, 2014). Finally, future research may examine each of the three actor/contact mechanisms simultaneously to evaluate which of these mechanisms reinforce one another and the relative impact of each of these mechanisms on network creation (i.e., network composition and/or structure). Such a program of research would be particularly useful for training interventions, as this research would help pinpoint specific beliefs about men versus women as network contacts that may contribute to differences in network characteristics.

Actor and contact mechanisms for UNR. Where unequal returns to network characteristics are identified (e.g., the proportion of men, actors' and contacts' network openness, relative status), we encourage future research to empirically evaluate each of the actor/contact mechanisms: (1) perceived legitimacy, (2) activation of contacts, and (3) types of resources exchanged. First, research is needed to investigate whether certain network characteristics are viewed by actors, their network contacts, or third parties as consistent with gender role expectations as well as whether such beliefs influence the resources received by men and women with these network characteristics. For example, Burt (2005: 45) found that actors in open networks describe themselves in agentic terms, but little research examines how people perceive themselves and others when they have certain network characteristics. Similarly, future research should investigate whether men and women in certain network positions (e.g., open networks) are more likely to engage in leveraging (Porter & Woo, 2015) or brokerage behaviors (cf. Grosser, Obstfeld, Labianca, & Borgatti, 2019); how men and women actors, contacts, and third parties perceive and respond to such behaviors (Floyd, 2014); and whether such behaviors and evaluations of these behaviors impact men and women's career returns differently.

An innovative way to evaluate perceived legitimacy from an actor's perspective would be to employ visual network scales (Mehra et al., 2014) or cognitive social structures (see Brands, 2013), which capture men's and women's perceived networks. Scholars could examine whether men and women actors' perceived (or actual) network characteristics impact their confidence and self-perceived value as a network contact and ultimately their attempts to derive returns from their networks. For example, Brands and Mehra (2019) examined whether men and women actors who perceived themselves to have open networks felt greater anxiety; they found that women (but not men) who perceived themselves to have open networks experienced greater anxiety and, thus, had lower performance. In addition, perceived networks could also be used to examine UNR mechanisms from contacts' perspectives. For instance, research may investigate how contacts view and respond (e.g., whether they provide career-benefiting resources) to men and women actors who they perceive to have certain network characteristics or act in gender-(in)consistent ways. Future research may build from studies like Brands and Kilduff (2014), which examined the perceived warmth and competence of men and women in open networks.

Second, we encourage future research to better understand whether and how men and women actors and contacts cognitively activate (and subsequently mobilize) subsets of their professional networks (for a review, see Smith, Brands, Brashears, & Kleinbaum, 2020). Our review reveals that men's and women's networks did not differ in their openness, structural status, or relative status; however, initial research suggests that women's successfully mobilized networks are less open (Jadidi et al., 2018; Whittington, 2018) and include contacts with higher structural and relative status than men, impacting their productivity (Ghiasi et al., 2015; Whittington, 2018). These findings suggest that the process by which men and women activate, seek resources from, and successfully mobilize their contacts influence how men's and women's network characteristics yield returns. Thus, we encourage scholars to investigate which contacts men and women actors cognitively activate, which contacts they request resources from (mobilize), which resources they request and receive, and whether they are successful in mobilizing resources from certain contacts. Since men and women actors cognitively activate and mobilize contacts when facing a specific resource need or goal (Smith et al., 2020), future research may examine how the goals and/or resources sought impact this process.

Third, the notion that the same network characteristic yields divergent resources for men and women is central to the UNR explanation, making it crucial for scholars to examine the resources men and women receive (rather than assume that the existence of a tie equates to the receipt of resources, as is typical of networks research; Borgatti & Halgin, 2011). Thus, a promising direction for understanding why UNR exists is to evaluate whether similar network characteristics yield the same amount and type of resources for men and women since certain types of resources are more directly associated with career success. Furthermore, researchers may move beyond tracking the types or amounts of resources men and women actors generally seek/receive to also investigating dyadic resource exchanges between an actor and multiple contacts, which would provide insights into which contacts are more willing or likely to exchange different types or amounts of resources with men and/or women.

Improving research examining both UNC and UNR. As research progresses on UNC and UNR, we encourage researchers to investigate the roles of actors' and contacts' personal characteristics in network creation and utilization. Prior research has controlled for personal characteristics that may shed light on some of the mechanisms outlined in this framework.

For example, a few studies examining average status and proportion of kin controlled for personal characteristics that are proxies for levels or types of work and familial role expectations (e.g., marital status, child-rearing responsibilities) or perceived utility as a contact (e.g., education, tenure, rank, employment status). When these control variables were included, gender differences in average status in instrumental and expressive networks were no longer statistically significant, whereas gender differences in the proportion of kin contacts were no longer significant in instrumental networks and were reduced (though still present) in general networks (see online supplement for details). Although this approach allows researchers to account for explanations, it fails to consider the potential interplay between gender and personal characteristics in network creation and utilization.

Finally, we encourage future research to engage in the theoretical and empirical work necessary to investigate how gender as a nonbinary construct as well as how the intersectionality of actor gender and other demographic characteristics (e.g., race/ethnicity, sexual orientation) impact UNC and UNR. For example, the role expectations associated with intersectional identities (e.g., Asian or Black women) may be qualitatively different than role expectations associated with gender alone. Thus, more research is needed to delineate the role expectations associated with nonbinary and intersectional identities and how those role expectations impact network creation and use.

Conclusion

Reducing gender inequality is a grand challenge facing scholars and practitioners alike (Banks et al., 2016). Scholars have made progress in identifying differences and similarities in men's and women's network characteristics since Ibarra's (1993) review, yet meaningful theoretical and practical advancement will only occur by investigating *how* men's and women's network characteristics impact their career outcomes and *why* gender differences in UNC and UNR exist. Even without research-based guidance, organizations are investing in initiatives to help women overcome perceived network barriers. Thus, it is imperative that we do not let another quarter century pass without providing clear answers to the questions of *how* and *why* men's and women's networks differentially impact their career success. We hope our review accelerates scholarship beyond a recognition of networks as part of the problem of long-standing career inequities toward a deeper theoretical understanding, more targeted research, and solution-focused practical action.

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Notes

1. Providing evidence regarding how the gendered professional context influences the returns men and women receive from their contacts, Abraham (2020) found evidence of contacts engaging in anticipatory gender sorting in male-dominated occupations but an equal likelihood of contacts recommending men and women to third parties in female-dominated or gender-balanced professions.

2. Scholars have theorized and broadly assumed that demographic “similarity increases ease of communication, improves predictability of behavior, and fosters relationships of trust” (Ibarra, 1993: 61), thereby heightening the motivation for and ease of knowledge sharing and resource exchange. Yet empirical research provides little support for these mechanisms (e.g., Levin, Whitener, & Cross, 2006). Men's and women's opposite gender contacts are also expected to be somewhat beneficial because those who are different from oneself (including regarding gender) may have more novel resources to provide men and women actors (Ertug et al., 2018).

3. Scholars often refer to men or women having more same-gender contacts than expected by chance as evidence of their “preferences” for same-gender contacts. We suggest scholars measure rather than assume such preferences since actors' and contacts' choices to connect with same-gender contacts are driven by more than preferences (and availability).

4. This count includes studies that did not hypothesize both UNC and UNR. For example, studies that hypothesize UNR for a network characteristic while also providing correlations between gender and that same characteristic and/or employing *t* tests to provide descriptive statistics regarding gender differences in that same characteristic are included in this count.

5. We do not recommend scholars create composite network measures that combine multiple (theoretically and empirically) distinct network characteristics (e.g., network size and diversity) as these composites obscure whether UNC or UNR are in operation for each characteristic.

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