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STRENGTH OF WEAK TIES AND THE MODERN JOB SEARCH

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF COMMUNICATION

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Abstract

This dissertation examines the social networks of job seekers and information sources using two samples of Americans who have sought jobs in the past two-years. After a brief introductory chapter and a chapter reviewing network terminology and three network theories (strength of weak ties, structural holes theory, and social capital), two studies were conducted. The final chapter proposes nested levels of network influence and suggests revision to social network theory and research.

Study 1 explored a random-digit dial survey of job seekers collected by the Pew Research Center. Data from participants who sought a job in the past two years was used to construct an affiliation (two-mode) network of job seekers and types of sources. Results from correspondence analysis, centrality measures, and an exponential random graph model (ERGM) show that job seekers used sources in conjunction at a rate greater than chance. Specifically, job seekers used three types of sources: (a) social sources (close friends and family, personal acquaintances, and professional acquaintances); (b) formal sources (print advertisements, career events, and employment agencies); (c) and online sources (social networking sites and online information and resources). Based on centrality measures, online information and resources were at the center of job seeker's affiliation network. A discussion section reviews implications for Strength of Weak Ties theory as well as practical implications for the job search.

Study 2 uses a survey of Amazon Mechanical Turk ® (MTurk) workers from the United States who have sought a job in the past two years. These participants responded to questions about the sources they used during the job search, including information

sources accessed online and offline. Strong ties included close friends and family contacted online and in-person as well as websites; in contrast, the weakest ties were direct online application, employment agencies, and career events. Results showed that, controlling for homophily, tie strength was positively related to social support, bridging, and ease of access. Additionally, weakness of tie was related to influence. Contrary to strength of weak ties theory, information quality was not related to tie strength. Finally, this study explored within-person attributes related to tie strength. Perceptions of the job search as a networking task were positively related to use of stronger ties; in contrast, feelings of uncertainty, above one's comfort, led to use of weaker ties on average. Perceptions of a larger personal network had a positive indirect effect on the strength of ties.

A final chapter presents implications for sociomateriality, latent tie theory, and network research, in general. These studies paint a complicated picture both supporting and challenging strength of weak ties theory. Specifically, the final chapter discusses these findings and concludes that the modern job search does not follow the premises accepted by most strength of weak ties research. Implications of research findings in three major areas: (a) the social and material similarities and differences between human and non-human information sources are discussed, (b) the situated use of ties is explored using the lens of latent tie theory, (c) the implications for social network analysis are detailed at multiple levels.

Chapter 1

The Strength of Weak Ties in The Modern Job Search

The way people find out about jobs and enter the modern workforce is changing (Kramer & Myers, 2014). The availability of job information is changing in the world of always-on Internet access. In fact, human resources professionals have become increasingly attentive to the use of technology in recruitment (Livens, van Dam, & Anderson, 2002). Given the importance of the job search process to both organizations and job seekers, the job search is a relevant phenomenon that involves many scholarship areas: communication networks, economics, sociology, business, and more. However, mixed evidence from across fields reveals a debate between whether searching and applying directly to a job or searching for work via social connections like friends, family, and acquaintances yields better job outcomes for job seekers (Montgomery, 1992).

Despite the increase in the modern job seekers' and employers' use of technology, the job search research is still, generally, focused on two types of sources: formal means (e.g., job postings, newspapers, direct application) and informal social network contacts (e.g., close friends, acquaintances, neighbors). Only about half of all job opportunities are publically posted; the rest remain in-house hires or hires from word of mouth (Dill, 2014). Since many jobs are not posted publically, the role of social networks during the job search is particularly important. Gee, Jones, and Burke (2017) synthesize existing findings about job searches using social networks: "In the U.S. between 15% - 23% of workers reported using friends or relatives during their job search, over 50% of workers found their job through a network contact, and 70% of

firms have programs encouraging referrals (Burks, Cowgill, Hoffman, & Housman, 2015; Granovetter, 1973; Ioannides & Loury, 2004; Rees, 1966; Topa, 2011)" (p. 5). As is evident in Gee et al.'s summary, jobs are not just found through job posting in the newspaper or online, but a person's social contacts are also an important source of information during the job search.

In relationship to both formal and informal means of job searches, the use of information and communication technology (ICT) is changing how job seekers access social connections. For example, Nikolaou (2014) found a very strong correlation (between .66 - .85) between use of social media (i.e., LinkedIn and Facebook) and perceptions of usefulness of that media in a job search. However, no evidence to date has demonstrated that use of online resources, social contacts, or formal means during a job search provide any comparative advantage to job seekers, despite much theorizing supporting one method or another (see Lin, Fu, & Chen's, 2014 edited volume for a recent review).

In all, there is very mixed evidence for which sources lead individuals to jobs and there is less evidence about why job seekers utilize each source of job information. This dissertation presents two studies to remedy the mixed findings about job information sources and the job search. The first study (Chapter 3) uses a nationally representative sample to explore what sources are used in concert during the modern job search process. The second study (Chapter 4) involves a dataset collected to explain why people turn to the sources they do during the job search juxtaposing both source attributes and job seeker cognitions to explain when and why job seekers use the sources they do. The rationale for these studies is briefly laid out in the following

paragraphs.

The Internet and the Changing Availability of Information

Job seekers can access more and more varied information as limits on time and space dissipate via the always-on Internet. Internet access shortens the spacio-temporal distance between any two parties who are not co-located. Users can access instant feedback and personal experiences about organizations through proprietary content (i.e., company webpages), user feedback, and aggregated user-generated information (e.g., reviews; Walther & Jang, 2012). The so-called Web 2.0 revolution (i.e., the use of webpages that rely on user-generated content like Facebook.com, Amazon.com reviews, Yelp, etc.) has brought an increasing amount of useful review information and informal insights that were previously unavailable. One theory, which seeks to account for differences in information sources during the job search process, is Strength of Weak Ties (SWT; Granovetter, 1973). The following section details this theory about job searches and suggests the need for revision in light of the changing availability of job information online.

Strength of Weak Ties

The Strength of Weak Ties (SWT) hypothesis was put forth by Mark Granovetter (1973, 1974) to explain how job seekers find information about job opportunities. Though SWT has been investigated extensively, with over 40,000 citations according to Google® Scholar (2016), evidence about the theory remains mixed. A great deal of debate about the importance and outcomes of tie strength comes from research in the job search process. The following paragraphs detail the SWT hypothesis, overview the changes in media environment, and present an argument for

testing SWT in the original job search context.

SWT Explained

Granovetter (1983) reviews the basic premise of the SWT: "The argument is that our acquaintances (*weak ties*) are less likely to be socially involved with one another than are our close friends (*strong ties*)" (p. 201, emphasis in original). That is, those with whom we are not particularly close in terms of time spent, emotional involvement, intimacy, mutual sharing, and reciprocal interaction are more likely to have access to new information than those with whom we are close (Granovetter, 1974).

Scholars agree, in principle, that the people we know well (i.e., strong ties) are more likely to know one another and thus have access to the same (redundant) information. Restated, our close friends form a denser (tightly connected and redundant) network than our non-close friends. Our weak connections, on the other hand, have access to their own close friends as well as other weak connections (a loosely connected and non-redundant network). SWT is focused on tie type and structural positions in social network. Ultimately, the hypothesis is that those whom one does not know well are in different (and otherwise inaccessible) social circles than oneself (Granovetter, 1973). Because weak social connections are in different social circles, they have access to different information and resources. In all, weak ties have the potential to offer much more in terms of novel information and access to otherwise inaccessible resources than do strong ties (Granovetter, 1974).

There is a great deal of intuition in the claim that those to whom a person is only loosely connected are likely to know different others and different information than those whom we know well. In fact, the provocative nature of SWT has garnered

research attention from economics (Montgomery, 1992; 1994), business (Adler & Kwon, 2002; Smith, 2012), sociology (Yakubovich, 2005), human resources (van Lievens et al., 2002), information sciences (Haythornthwaite, 2002; 2005), and network research (Burt, 2000; Lin, 1999; 2001). SWT has contributed to significant advances in social network analysis by both suggesting hypotheses to be tested and prompting additional theorizing (see the theoretical framework and network analysis discussion in Chapter 2; Mardsen & Campbell, 2012). However, few computer-mediated communication scholars have addressed the function of ties in the changing media landscape (for exceptions, see Burke & Kraut, 2013; Chen, 2014; Gee et al., 2017).

Shifts in the Availability of Ties Based on Media

The availability of both strong and weak ties is changing commensurately with advancing communication media platforms. Anyone can call up an unknown other in a chat room or find novel information from an organizational insider on an employer review website (e.g., glassdoor.com, indeed.com); at the same time, asynchronous messaging allows us to send out calls to strong or weak ties at any time of the day and receive a response at the tie's convenience (Edley & Houston, 2012). Granovetter (1983), Haythornthwaite (2002), and Contractor and Eisenberg (1990) all contend that as more complex communication media become available, which enables a person to maintain a greater number of social connections at a lower cost, the potential for weak connections to benefit a person seeking information increases.

In contrast, Dunbar and Spoors (1995) posited that the average human is only capable of maintaining a social circle (remembering names and faces) of about 150 individuals. Though there are some exceptions to this rule (the former U.S. president,

Bill Clinton, can purportedly recall the names/faces of 5000 individuals; Kadushin, 2012), Dunbar's number (or the social brain hypothesis) has been a useful basis for those theorizing about human relationships (cf. Rheingold, 2012; Wellman, 2012). Dunbar (2016) uses data from two U.K. samples to contend that when compared with the mean number of contacts available via social websites (i.e., Facebook), the number (m_1 = 155.2; m_2 = 182.8) is not significantly different from 150. That is, Dunbar (2016) concludes that our cognitive capacities match with our online networking behavior, at least when it comes to the number of Facebook friends. In contrast, Smith (2014) reports for Pew Research that the average number of 338 Facebook friends for American adults and a median of 200 friends. In line with these Pew findings, media scholars contend that the use of social networking sites enables individuals to maintain much larger social circles (Rheingold, 2012; Wellman, 2012).

Haythornthwaite (2002; 2005) takes a middle position, as she suggests that "the linear phenomenon of the strength of interpersonal ties gives rise to nonlinear impacts on the adoption of new media" (p. 386). That is, humans are able to maintain social circles that conform to the theory of Granovetter and Dunbar, but humans are also able to access "latent" ties which are "ties for which a connection is available technically but that has not yet been activated by social interaction" (p. 389). One context where the debate between expanded networks and available resources has played out is in research on Facebook use and social capital.

Social capital perception and measurement. *Social capital* is defined as the culmination of available resources that flow through one's social network (Adler & Kwon, 2002). Social capital is a broader construct than SWT because it encompasses all

available network resources and does not discriminate as to how or why resources are obtained (for an in-depth discussion, see Chapter 2 or Lin, 1999; 2001). As Brooks, Hogan, Ellison, Lampe, and Vitak (2014) explain, "In all cases, social capital tends to be a general stand-in for positive social outcomes from social interaction" (p. 2). Social capital can work at short distance (for example, a job seeker has a close friend on the search committee for a potential job) or at greater social distance (a job seeker knows someone who knows a manager for the position). Though social capital is a network-based construct, Williams' (2006) scales of bridging and bonding social capital and Ellison, Steinfeld, and Lampe's (2007) scales of maintenance capital have dominated the research on the effects of social media use and social capital (Brooks et al., 2014). These scales rely on perceptions of available resources rather than one's actual social network composition. The online social capital research has focused on differentiating the effects of bridging, bonding, and maintenance social capital.

Bridging social capital is the set of benefits that typically come from loosely knit networks including access to unique information and resources that can be earned or accessed from connections outside the relationship between ego (self) and alter (partner; Putnam, 2000). Bridging social capital is essentially the information resources described by SWT as weak ties. An example of bridging social capital would be when a weak connection posts about a lucrative job on Facebook, providing a job seeker with resources he or she would otherwise not have known about. *Bonding social capital* is the "extent to which participants reported having someone who could provide emotional support and advice and access to a scarce resource, such as a financial loan" (Brooks et al., 2014, p. 3). Bonding social capital is a benefit of being surrounded by close

interpersonal connections who are generally willing and able to help and comparable to strong ties in the SWT framework. Generally, strong ties are associated with bonding social capital. During a job search bonding capital is demonstrated when a close tie goes out of their way to help a person secure a job. For example, if a close friend chairs a search committee and texts the job seeker "you did so well" following an interview with the committee.

Maintenance social capital is a newly posited form of social capital which allows individuals to maintain relationships with others (Ellison et al., 2007). Maintenance social capital might be formed (or generated) when an individual is just chatting with a friend or an acquaintance and passively hears about a job opportunity. Research on the obtainment of social capital via social media usage has shown that individuals perceive or access all three kinds of social capital on Facebook, although most research focuses on maintenance and bridging social capital (for a review, see Ellison, Vitak, Gray, & Lampe, 2014).

One problem with much of the social capital research is that perceptions of social capital and observable network compositions do not match (Brooks et al., 2014). That is, while bonding social capital should coincide with many strong ties, perceptions of bonding is accounted for by many other factors than number of strong ties; conversely, bridging social capital and weak ties are weakly related. Using social network analyses of aggregate Facebook data, Brooks et al. (2014) concluded, "Facebook use in itself is not a guaranteed path to perceptions of more social capital" (p. 10). Brooks et al. found that, contrary to the types of social capital laid out above, transitivity, a tendency to close connections between three nodes in the network, was

negatively related to perceptions of bonding social capital. In other words, a person's network and his or her perception of the resources available in the network are two related but distinct constructs. Thus, the perception of network benefit and a user's actual online network composition differ in that the less connected a network, the more social media users perceive that they are surrounded by others who can support and advise them whether or not it is actually true.

Network composition. Given this mixed evidence in online social network perceptions and actual composition, researchers are prompted to ask whether weak and strong ties are changing in nature, the compositions of social networks are shifting, or if both or neither are occurring. The answer is complex. Broadly, the number of Americans who are socially isolated (i.e., do not report having at least one person to "discuss matters that are important to you") has increased from 8.1% in 1985 to 12.0% in 2008 (Hampton, Sessions, & Her, 2011, p. 137). In concert, however, the use of the Internet is associated with larger networks compared to non-users' (Boase, Horrigan, Wellman, & Raine, 2006; Chen, 2014). Hampton et al. (2011) suggest that the size of networks for both users and non-users of the Internet is smaller than it has been in the past; however, "mobile phone users and those who use the Internet, especially specific social media, are more likely to have larger and more diverse core networks" (p. 149) than non-users.

Thus, the conclusion seems to be that the nature of strong and weak ties remains, generally, the same. In terms of interaction and social connection, Internet users have the same access to strong and weak ties. Americans have close contacts and interact differentially with strong and weak ties. In sum, individuals continue to cultivate some

strong relationships with relationally close partners and a great proportion of weak tie relationships with nonclose relational partners either from interacting interpersonally or through social media.

What is changing, however, is the availability of weak ties to provide information and support on-demand (Haythornthwaite, 2005). As Rozzell et al. (2014) conclude:

> Strong ties continue to remain strong, providing the social support and frequent offline contact predicted by Granovetter (1973); but weak, nonclose relational ties seem to be increasingly able to provide similar social support through the lightweight interaction available via social media (Ellison et al., 2007). (p. 277-278)

Despite the intuitive claim of SWT, on Facebook both strong and weak ties are able to provide statistically equivalent levels of social support. That is, the amount of social support received through comments on Facebook was not significantly different across different ties (Rozzell et al., 2014).

In all, Boase et al. (2006) and Hampton (2011) show that Internet users have comparatively more strong and moderate relationships than non-users do. Chen's (2014) results suggests no difference in number of strong ties between heavy and light Internet users, but he found a greater quantity of weak ties and greater turnover in weak ties across time for heavier Internet users. Coupled with longitudinal evidence about overall network composition, it seems that Americans' core discussion networks (i.e., strong and moderate ties) are shrinking (relative to 1985; Hampton et al., 2011; Putnam, 2000), while the number of weak ties remain the same or slightly higher. Thus, network composition is shifting (Brooks et al., 2014; Haythornthwaite, 2002; 2005; Donath & boyd, 2004), but there is little evidence the nature of ties has changed though new

media seem to facilitate additional forms of social connection.

Because of the reduced size of Americans' social networks, Putnam (2000) famously presents a picture of a dystopia in which Americans' sources of social connections are eroded by decreases in community involvement, less trust in society in general, and lower membership in bowling leagues and other voluntary organizations. In contrast, there are many scholars who contend that the social landscape is shifting rather than decreasing. For example, Kraut et al. (1998) reported on the Internet paradox whereby higher Internet use was related to a decline of the social circle participants maintained face-to-face. Several years later, in a follow-up study with the same participants, Kraut et al. (2002) found longitudinal evidence which demonstrated that the Internet helps individuals span spacio-temporal divides and maintain *more* relationships than would be possible without such technology. As Haythornthwaite (2002; 2005) points out, even if Americans are not regularly interacting with relational partners, the number of latent contacts available online is enormous thanks to the network structure of the social web.

In sum, it seems online communication gives us access to more and weaker ties than was previously possible. However, the nature of ties remains essentially the same (Boase et al., 2006; Ellison et al., 2007). Weak ties continue to be those with whom we are not close and interact with infrequently; strong ties continue to be those with whom we are close and interact often. However, new media enable easy access to both strong and weak ties and facilitate social support from each type of tie (Burke & Kraut, 2013; Rozzell et al., 2014). Additionally, media enable quick access to weak ties that may alter the type, time, and frequency of interaction. An example of this is Gee et al.'s

(2017) finding that during the job hunt, a person's weak social connections are useful because of their quantity, but strong social connections are also important because of the quality of those relationships. Specifically, Gee et al. found that users benefit from *both* strong and weak ties for finding jobs. They conclude that strong connections are useful because they can introduce and intervene in job availabilities for a close relational partner, but that job seekers more frequently find jobs through weak ties (this paradoxical finding is the focus of the theory laid out in Chapter 2).

The Job Search and the Changing Nature of Network Composition

Dunbar (2016) demonstrates that the number of social contacts individuals maintain on Facebook is not significantly greater than the number of contacts maintained face-to-face. However, the social web is making previously unknown and inaccessible others available with greater ease. As Haythornthwaite (2005) explains, "a new medium…(1) creates *latent ties,* (2) recasts *weak ties* – both forging new ones *and* disrupting existing associations – and (3) has minimal impact on *strong ties*" (p. 136, emphasis in original). Research about tie use online and during the job search seems to confirm Haythornthwaite's (2002; 2005) theorizing. While Facebook may not dramatically change the composition of one's network (depending on whether Smith (2014) or Dunbar (2016) is more persuasive to researchers), certainly review websites like Glassdoor.com, Indeed.com, or Monster.com that hosts thousands of people's opinions about a given organization serve as a means to allow for the activation of latent ties. Accessing review websites (and interacting with people there) could convert previously unknown others, who would otherwise be difficult to access, from latent ties into weak ties.

As shown in the chapters that follow, the evidence for the use of social connections, formal means, and the Internet in job searches has been quite mixed. Many times scholars focus on one particular medium (e.g., Facebook; Burke & Kraut, 2013; Gee et al., 2017) or one particular kind of social tie as potentially useful (e.g., Granovetter, 1973; Yakubovich, 2005). Few studies have examined the use of resources in concert to obtain jobs (for exceptions see; Blau & Robbins, 1990; Holzer, 1988). Examining the difference between the use of social networks and the competing (and at times complex) social theories can help both employees and employers improve the job search process (Burt, 2005). Revealing the network of resources available to job seekers can help illuminate which methods are most responsive during the search process.

Mardsen and Gorman (2001) define an effective job search as a multidimensional combination of the rate at which jobs are found, the rate at which offers are received, and the information job seekers have before accepting a position. Marsden and Gorman conclude that informal job search methods provide benefits in terms of reduced duration of unemployment and higher number of offers received. Thus far, however, "findings are inconclusive with respect to the question of whether the use of informal channels heightens applicants' and employers' knowledge of each other" (p. 485). Marsden and Gorman's (2001) conclusion is significant because it means that while SWT works, the underlying argumentation (that weak ties provide more diverse information than strong ties) may be identifying the wrong justification for weak tie success. However, when it comes to quality of job, there is little evidence that the use of informal contacts is superior to other search methods. Marsden and Gorman (2001) summarize: "Although the use of social ties appears to increase the likelihood of finding

any job, there is not conclusive evidence that this leads to *better* jobs" (p. 485, emphasis in original). Indeed, Granovetter (1973; 1974 [1995]) accepts that the strength of weak ties is in finding *a* job efficiently, not necessarily finding *the best* job efficiently.

Revealing the benefits and drawbacks that employees perceive in various job search sources can help employers focus their time, energy, and monetary resources toward the highest return job recruitment process (e.g., Fernandez, Castilla, & Moore, 2000). Additionally, understanding the most effective search techniques can aid job seekers by revealing the best available job search resources. The following paragraphs briefly lay out a plan for this dissertation in light of the multitude of resources available to a modern job seeker and the discordant research findings summarized thus far.

Two Studies Disentangling the Sources of Job Information

The SWT hypothesis requires additional examinations and possible revisions in light of technological advancement. Technology alters the accessibility of information about jobs and reduces the spacio-temporal distance between a hiring organization and a job seeker. As Nikolaou (2014) explains, "job seekers…expect (or wish) that [the use of online social networks] will bring them closer to job recruiters and job opportunities" (p. 187). Online contacts can provide support for unemployed individuals increasing both self-efficacy and active job search processes (Fieseler, Meckel, & Müller, 2014). Feuls, Fieseler, Meckel, and Suphan (2016) found that use of social media provides contact with others, can structure daily activities, and fills time in a personally meaningful way for some unemployed individuals. Unemployed individuals were more motivated to use the Internet for job searches than for either social contact or entertainment. Studying the job search process, Brouer, Stefanone, Badawy, Egnoto,

and Seitz (2015) found that more than 60% of participants turn to organizational websites when seeking a job: 65% use Facebook, 59% LinkedIn, 31% Twitter, 46% resume websites like Monster.com, and 49% used newspapers. Across various information sources, it is clear job seekers turn to many and different sources for reasons that push the scope of published research on SWT.

Though Brouer et al. (2015) did not measure the use of personal connections, these findings suggest the SWT hypothesis is in need of a revision that includes technological tools of job searches. Looking at the modern job search, the changing availability of social connections alters the sources job seekers turn to and benefits job seekers perceive from each source. These new and varied sources offer new venues for theory-driven research. This dissertation explores how the uses of technology (e.g., latent ties, available through online reviews or weak ties, such as acquaintances) changes the modern job search process and seeks to disentangle what particular benefits and drawbacks job seekers anticipate from information accessed through each job source. Two studies are proposed to explore the changing landscape of job seekers' social networks and extend theory about social connections used during a job search.

The first study, Chapter 3, will explore how the changing availability of weak ties is altering the sources job seekers utilize. Study 1 uses an existing data set, which includes technological sources of job information, to reveal the combinations of resources used by recent job seekers. Specifically, Granovetter (1974) reports that individuals find jobs through the following sources: 56% from personal connections, 19% from formal information sources (e.g., newspapers, job boards), 19% through direct application, and 7% through other means. Blau and Robbins (1990) used data in

which users could report using multiple sources during a job search. Searchers used an average of two sources each. Direct contact was the most frequent form of search (60%), 48% used newspapers, 35% used state employment services, 29% used a friend or family member, 24% reported using another source, and 9% used private employment agencies. Smith (2015) reports, using a nationally representative sample collected by Pew Research, that people who sought a job in the last two-years used: 79% online resources (34% say this is the *most important* source, included in parentheses that follow), 66% close connections (20%), 63% professional contacts (17%), 55% acquaintances (7%), 32% employment agencies (5%), 32% ads in print publications (4%), 28% other means (e.g., fairs and conferences; 5%).

Both the value placed on technological means in the job hunt and the amount of their usage demonstrate that Granovetter's (1973; 1974[1995]; 1983). SWT needs to be reexamined in light of changing communication technologies in order to understand the increased accessibility of both weak and latent ties. The first study uses social network analysis to examine the co-occurrence of sources during the job search. This study utilizes the Pew Internet and American Life Project's (2015; Smith, 2015) "Searching for Jobs in the Internet Era" data to explore the networks of participants who have sought jobs in the last two years. Hypotheses and research questions about the utilization of multiple sources are tested using social network analysis.

The second study explores the SWT theory and, specifically, seeks to explain differences between strong and weak tie utilization by current job seekers. Using the assumptions of latent tie theory (Haythornthwaite, 2002; 2005), this study conceptualizes the use of various communication technologies to access strong ties,

weak ties, and impersonal Web 2.0 websites (e.g., Glassdoor.com, job boards, etc.) as a means to activate latent ties. In this study, the focus is on the utility and utilization of ties to access unique information. This study uses predictions from modern SWT research (Burt, 2000; 2005; Lin, 1999; 2001) to examine the role of information, influence, accessibility, and structural position as potential sources of value in network ties. Understanding how individuals seek job information and why they choose to utilize particular network resources will provide a deeper understanding of how job information is communicated socially.

The next chapter introduces the body of SWT research tracing the theories development across time while comparing and contrasting SWT to social capital and structural holes theory. The second chapter also introduces key language from the network perspective. Following this review of literature, the two subsequent chapters (3 and 4) lay out hypotheses, research questions, methods and results exploring, in-depth, the SWT hypothesis in light of the ubiquity of the Internet. Chapter 5 provides implications for these findings and a brief conclusion to this dissertation.

Chapter 2

Mixed Findings from Strength of Weak Ties:

Reviewing Terminology and Theory

Malcolm Gladwell explains, “If you're an academic groupie like I am, Granovetter is like James Dean” (Glass, 2016). Gladwell is referring to the prolific effect Granovetter’s Strength of Weak Ties (SWT) has had on network theory, sociology, economics, and other social research and theory. Despite the heuristic value of SWT, the evidence from tests of the theory has been quite mixed (Granovetter, 1995). In light of this mixed evidence, SWT has prompted additional network measurement techniques and theory. The goal of this chapter is to provide an in-depth background on SWT and network theory. Specifically, the following paragraphs introduce key network concepts relevant to this study, review research on SWT in the job search context, and present two subsequent theories that seek to refine Granovetter’s original conception. The overview provided here serves as the broad theoretical bases for the studies proposed in Chapter 3 and Chapter 4. For readers already familiar with social network theory and analysis, it is recommended that you visit the two studies of Chapter 3 and Chapter 4 directly.

Though Granovetter’s (1973; 1974 [1995]; 1983) articulation of SWT is quite straightforward, there are several potential underlying mechanisms that may affect how social connections function during a job search. As reviewed in Chapter 1, the contribution provided by SWT is a distinction between the usefulness of strong ties, (relational partners whom ego considers close, shares resources with, confides in, and generally trusts,) and weak ties (non-close relational partners; Granovetter, 1973).

Granovetter (1983) clarifies some boundary conditions: weak ties are useful to the extent that they provide access to novel information/contacts and strong ties are useful to the extent they are willing to exert effort to help or influence others. Both strong and weak ties can be quite beneficial in finding jobs. Weak ties are able to share novel information but strong ties are able to put in a good word (for a further discussion, see Burt, 1992; 2000; 2005). Already, a social theorist is faced with a paradox: How can SWT be correct when the benefits of strong ties are both intuitive and obvious? Some academicians have spent entire careers trying to reconcile the benefits provided by both strong and weak social connections.

Recent data from millions of Facebook users reinforces the paradox of SWT. Weak ties are useful because they are plentiful, and thus the majority of jobs are found through weak ties. However, though they are few in number, the quality relationship provided by a strong tie is a stronger predictor of finding a job than is a weak tie connection when compared one on one (Gee et al., 2017). That is, weak ties are useful because they are numerous, while strong ties are useful, though they are fewer, because a closer partner is more willing to help. Gee et al. found that, controlling for order of employment, the majority of Facebook users ultimately work with weak ties, not strong ties, but that, "an increase in tie strength is associated with an increase in the probability of working with a pre-existing friend at a shared workplace" (p. 34). For every 10 percent increase in communication between two people, there is a corresponding 20 percent increase in the likelihood of sharing a workplace. On their face, these findings may seem inconsistent with SWT. However, Granovetter (1983) reminds students of the theory that though weak ties are the most efficient source of job information, strong ties

are still potentially useful: “Weak ties provide people with access to information and resources beyond those available in their own social circle; but strong ties have greater motivation to be of assistance and are typically more easily available” (p. 209). To lay out the mechanics underlying these theoretical claims, it is first necessary to review basic social network analysis (SNA) terminology. Following the explication of SNA terminology, a review of research findings on SWT in the job search context is presented along with two subsequent theories, structural holes theory and social capital.

Social Network Analysis Terminology

To begin, this section briefly outlines some essential network terminologies that will be used frequently throughout this dissertation. This review is not meant to be comprehensive. Instead, this section introduces key terminology which is relevant to understanding the network theories relevant to job search. The subsequent sections and chapters offer some more specific terminologies that describe measurement and testing of each theory in greater detail. The content in this section is detailed in much greater depth in Hanneman and Riddle’s (2005) textbook (available here: http://faculty.ucr.edu/~hanneman/nettext/) and Wasserman and Faust’s (1994) technical manual. The overall definition of social network analysis is articulated well by Kilduff and Brass (2010) as “the study of sets of actors and the relations that connect and divide them” (p. 319).

The most basic unit of network analysis is the ego-alter relationship. *Ego, node,* or, *actor* refers to a unit in the network; “actors are discrete individual, corporate, or collective social units” (Wasserman & Faust, 1994, p. 17). Two actors that are connected are called an ego and an alter, or an ego-alter dyad. The terms actor and ego

generally refer to a focal unit while the term alter and node tend to refer to a generic unit in the network. *Alter* refers to the other to whom the focal node is connected. Wasserman and Faust (1994) define a social network as "a finite set of actors and the relation or relations defined on them" (p. 20).

Network analysis is preoccupied with examining relations (or relational patterns and structures) between actors. *Ties* or *relationships* refer to the connection (or strength of connection) between any two nodes in a network. Two nodes are often referred to as *i* and *j* respectively, a *dyad*. In the relationship between myself and my wife, we might say: Cameron is *i*, his wife is *j*, and the relationship *i,j* is a strong tie. Triads are also a fundamental unit of network analysis; *triads* are "a subset of three actors and the (possible) tie(s) among them" (Wasserman & Faust, 1994, p. 19). An example of a triad might be: actors *i,j* have a strong tie, *i,k* have a weak tie, and *j,k* is also a weak tie (a so-called forbidden triad in Granovetter's theory, see discussion below). The number of ties that must be crossed in order for one node to reach another is called a *path* or *walk*. For example, if my advisor knows Mark Granovetter personally, but I do not, there is a path of length two between myself and Dr. Granovetter: me (*i*) → my advisor (*j*) → Dr. Granovetter (*k*).

Relationships between actors can be measured in numerous ways including strength of relationship, frequency of interaction, or type of relationship. The value associated with the amount or strength of relationship is generally referred to as *valence* or *tie strength*. The idea that two sets of actors (*i,j* and *i,k*) have different strengths of relationship is the foundation of SWT. Frequency of interaction has also been utilized to conceptualize relational strength (see detailed discussion in Chapter 4/Study 2). In terms

of directionality, relationships can be considered undirected (the relationship is the same for both actors involved) or they can be directed (*i* considers *j* a tie but *j* does not perceive a relationship with *i*). Additionally, valence and direction can be combined: for instance, I may email my class once a week, but each student in my class may email me infrequently and they do not email one another at all. In this case, I have a high level of (in terms of frequency) *outdegree* (number of connections directed out to alters) with my students but they have a low *indegree* (number of connections directed toward the ego) because all communication comes from me. Thus, the valence and direction of relationships are both potentially important in SNA.

SNA could involve analyses of multiple networks; for instance, any two actors/nodes (*i*,*j*) could differ in terms of ties strength across an academic network, a friendship network, a family network, or any other kind of relevant network. Examining a single type of network, like workplace interaction, represents a *uniplex* or single-focused network. In contrast, having multiple ties across multiple types of networks is called *multiplexity,* a term originally used by Gluckman (1962). Verbrugge (1979) explains multiplexity as term signaling, "*multiple bases for interaction* in a dyad" (p. 1287, emphasis in original). Much SNA has begun focusing on media-based multiplexity, or the use of multiple media to interact with others (Haythorthwaite, 2005).

Networks focus on the relationships between actors, but can also account for (both testing for difference in or controlling for) unique characteristics of individual actors, called *attributes*. Although a pure structural perspective would deny the importance of actor attributes (like demographics, measured personality traits, or other

psychological variables) by prioritizing network functions; increasingly, attributes are considered an important component to SNA (for a discussion, see Lin, 1999). Still, the argument presented later in this dissertation (Study 2, Chapter 4) is that a focus on structure has separated research results from the free-will that actors have when acting in a network.

Network level data also describes the overall relationship between actors in the measured social environment. For example, actors who are relatively well connected (i.e., have many relationships with alters) have higher actor *centrality* scores. A network full of actors who are well connected to one another is signaled by higher network *centralization* scores. A network with many connections can also be defined in terms of *density,* or number of present connections relative to all possible relationships. The tendency of actors to form triads is called *transitivity.* Networks which have a great deal of transitivity are said to create *closure;* that is, they tend to fill in a greater proportion of the available connections. Finally, when actors lie in-between two other actors in a network they are said to be a *broker* or *liaison* and will have higher *brokerage* scores. As Hanneman and Riddle (2005) explain, “a "broker" ego falls on the paths between the others” (p. 135). Brokers or liaisons are often conceptualized in theory as nodes who connect previously unconnected groups of others, as detailed below (Burt, 2000). Chapter 4 details the role of brokerage through perceived ability of sources to serve as a liaison between job seekers and jobs and introduces an innovative measure for this concept.

The last distinction for basic understanding of SNA is in the different types of analyses available. In the first study (i.e., Chapter 3) publically available data is used to

construct a two-mode ego network. That means, this data was reported by the node of interest and creates an *affiliation* or *two-mode* network, which examines actors as one "mode" and the mutually constructed activities or shared events as another mode. For example, job seekers are one mode during the job search and the sources they utilize are another mode. Hanneman and Riddle (2005) describe a two-mode network as "ties between two sets of nodes at two different levels of analysis" (p. 263). The study detailed in Chapter 3 utilizes a job-seeker and source two-mode (affiliation network) while the second study, Chapter 4, utilizes only job-seeker networks. Both studies (Chapter 3 and Chapter 4) also use an *ego-network* approach (in which all connections are reported by the ego), as opposed to a whole network approach in which every actor independently reports connections.

Focusing on an ego-network means that these studies cannot account for structural patterns; instead, this data will allow for a more nuanced understanding of choices actors make based on perceptions of network structure and attributes of alters (Halgin & Borgatti, 2012). In fact, Hanneman and Riddle (2005) explained, "If we want to understand variation in the behavior of individuals, we need to take a closer look at their local circumstances" (p. 132). The other common type of network analysis, not used in these studies, is *whole network approach* whereby a researcher collects information about all network members directly from each node or from extractive data. Generally, the whole network approach is considered the standard for understanding structural effects of relationships between actors (Wasserman & Faust, 1994).

Summarizing the body of organizational social network research, Kilduff and Brass (2010) conclude that the two "home-grown" theories in this context have been

SWT and structural holes. Given the importance of these two theories, the next section reviews SWT. Afterwards, structural holes theory and a third theory, social capital theory, are briefly introduced.

SWT and Job Searches

SWT theory dichotomizes social connections based on the strength of relationship between ego and alter (Granovetter, 1973; 1974 [1995]; 1983). Despite extensive research on the theory, SWT has not been universally demonstrated in job search research. Mouw (2003) claimed, "intuition and anecdote aside, we have little empirical evidence showing that contacts matter" (p. 891). Lin, Lee, and Ao (2014) concluded a decade later that "use of contacts does not show any advantage in job attainment" (p. 21); yet, Lin et al. found that use of higher status contacts does lead to better jobs. Generally, higher status contacts were weak rather than strong ties (Lin et al., 1981). Further, research by Blau and Robbins (1990) found that use of friends and relatives (in conjunction with other sources) leads to significantly more offers and acceptances than public and private employment agencies, newspaper use, direct employer contact, and other sources. In fact, among those who were unemployed, three-fourths accepted jobs offers that came through friends and relatives. Van Hoye, van Hooft, and Lievens (2009) demonstrated that time spent networking was positively related to number of offers (though unrelated to job fit or employment status). Gee et al. (2017) found that, for Facebook users, the plurality of jobs come through weak ties. Finally, using interview data in Russia, Yakubovich (2005) showed that more jobs proportionally come through weak and medium tie strength connections than strong ties.

In contrast, Marsden and Gorman's (2001) review of the research on the use of social ties during job searches concluded that social connections do matter and cautioned that "an undifferentiated informal category [not separating out type of tie] conceals much important variation" (p. 473). Chen (2014) suggested that the jury is still out on the role of ties in a job search since "few studies have gone beyond social capital in general and examined strong and weak ties independently" (p. 151). Social capital is detailed in a few pages, but it seems that while some scholars are eager to close the book on SWT, the mixed results leave this theory in limbo.

The large number of potential outcome variables (e.g., job satisfaction, fit, duration of employment, acceptance of offers, etc.) make it difficult to determine an appropriate criterion by which SWT can be evaluated. Granovetter (1995) defended the theory and claimed that weak ties are particularly efficient and researchers should focus on *efficiency of a job search* (e.g., duration of unemployment, number of offers) rather than job outcomes. Though the findings of SWT have often been extended to job search outcomes (offers, acceptances, status, pay, etc.) it is important to note that SWT is a descriptive theory. Granovetter did not intend to *prescribe* how a job search ought to go; instead, SWT is focused on *describing* how people find jobs. Therefore, this dissertation pays little attention to job search outcomes, with an eye on the process of job search and this essential network theory.

Measuring Ties

Granovetter (1983) conceptualized weak ties as acquaintances and strong ties as friends and family. Specifically, Granovetter (1973) defines tie strength as "a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual

confiding), and reciprocal services which characterize the tie" (p. 1361). Still, Granovetter's (1974) dissertation used only frequency of contacts and classified participants into a trichotomy: those who saw each other at least twice a week were classified as strong ties, those who saw each other less than twice a week but more than once a year were moderate ties, and those who saw each other once a year or less were classified as weak ties. Others have conceptualized ties as distinctively based on relational closeness, frequency of interaction (rather than just seeing one another), relationship type, or some amalgam of these factors (for a discussion, see Marsden & Campbell, 1984; 2012). SWT assumes that weak ties, by definition, are less likely to have the same social circles as the ego (Granovetter, 1973). That is, weak ties should have the *potential* to provide a bridge to otherwise inaccessible networks. However, weak ties are not always bridges to external cliques. Additionally, strong ties provide substantial benefits that cannot be ignored (Bian, 1997; Gee et al., 2017; Granovetter, 1983). Granovetter's (1983; 1995) follow-ups criticized some replication studies for different operational definitions of ties from his original choice of frequency of contact (and despite his original expansive definition including frequency, reciprocity, trust, emotional involvement; Granovetter, 1983).

Marsden and Campbell (2012) concluded that relational closeness has been the most faithful conceptualization of tie strength (see Mardsen & Campbell, 1984). They also caution that it is important to consider time spent together, mutual reliance, reciprocity, but note that relationship title/label (i.e., sister, friend, etc.) seems to capture something other than tie strength. Thus, when exploring the strength of weak ties, it is best to focus on relational differences between close and nonclose relational partners to

demonstrate the principles of SWT. When possible, studies should examine several indicators of tie strength or a more comprehensive scale to be sure (Marsden & Campbell, 2012).

Though it is possible to infer the strength of a social tie based on interaction data, it remains to be seen if nonintrusive activity monitoring can successfully determine tie strength. For instance, using data from Facebook, Spiliotopoulos, Pereira, and Oakley (2014) were only able to classify strong and weak ties correctly less than 70% of the time. Gilbert and Karahalios (2009) report 85% accuracy in prediction based on Facebook interaction data. Gee et al. (2017) report success rates in the 80-90% in using proprietary Facebook data to match tie strength. In all, researchers investigating SWT must specify how and why ties were classified as they were in each study.

Communication and SWT

There is no doubt that when Granovetter (1983) writes about how information flows through a network, he is talking about communication. In fact, Granovetter calls the SWT a "communications argument" (p. 202). In reviewing sociological findings, the theory is rooted in the idea that communication with close others is elaborated (laden with complex shared experience and meaning) whereas communication with weak connections is restricted (simple, direct messages with explicit meaning). In all, the SWT is really a question of "who says what to whom" (Lasswell, 1948). The ability of relational partners to convey tacit and explicit information is explored further in Study 2, Chapter 4.

Communication is essential to network formation. There is growing evidence that one important consideration for those sharing job information with others is

knowledge about the character and life-circumstances of the potential target. Specifically, in her working paper, Smith (2012) proposes that cognitive and affective perceptions of strong ties led some participants to not share job information. This finding is intuitive: if a job seeker is a close contact but is also known to be a poor worker, social contacts are not likely to share job information with that person. Certainly, even for close ties, an intermediary is not likely to "put in a good word" if doing so reflects is expected to reflect poorly on the contact with job information. Conversely, Marin's (2012) qualitative evidence showed that some participants shared information because they knew particularly close others were in need of a job. Like all communication, job information is not without costs (Watzlawick, Beavin, & Jackson, 1967). Sharing information one is privy to incurs penalties if it leads to negative outcomes (e.g., the company hiring an ineffective worker and/or a recommended person reflecting poorly on the self).

Information versus influence. Whether sharing information or endorsing another, communication is the basic mechanism that makes SWT work. Communicating job information to a job seeker means information from an employer (*k)* goes through an intermediary (*j),* most likely a weak tie, to the job seeker (*i*; $k \rightarrow j \rightarrow i$). Granovetter (1973) also contends that employers (*k*) can receive recommendations from social ties about a job seeker; in this case, communication flows from the ego to an alter who recommends to the organization ($i \rightarrow j \rightarrow k$). Thus the claims of SWT are not based on a directed network, but a network of both information and influence.

For any communication partner (*j),* whether strong or weak tie, to communicate information has implications. Recent evidence details communicative costs associated

with transmitting information about jobs. Marin (2012) suggests that when organizational members know about a job opportunity, they share job information just 27% of the time (proportionally 41% of the time with strong ties [*n* = 61], 19% with weak ties [*n* = 105]). It is worth pointing out that while the proportion of job information shared with strong ties is higher, the quantity shared with weak ties is greater (in line with Gee et al.'s [2017] research on Facebook). As a compliment, in this sample, recommending a potential job candidate was infrequent despite the fact that participants received a $500 bonus for recommending successfully employed alters. Thus, in line with SWT, connections have the ability to both share information and directly influence job outcomes but it seems those with information and ability to influence are acutely aware of the costs associated with sharing. As one participant stated: "if you maybe have a bad attitude or you're always late, then maybe if I'm late once they might start to associate me with that person" (Marin, 2012, p. 24).

Still, information flow is the primary benefit highlighted by SWT. Granovetter (1974 [1995]) used a macroscopic perspective in which information includes both job details flowing to the job seeker and when an alter "puts in a good word" for the alter (p. 54- 58). Whether that information flows from a weak social connection to the job seeker or that information is a message of influence from a social connection to a potential employer, SWT only makes claims about the likelihood of weak social connections as part of the interaction. Further, little research has distinguished between these two forms of information movement, although the second study (proposed in Chapter 4) seeks to distinguish influence and information benefits sources are perceived to provide.

Granovetter (1973) maintains that both strong and weak ties can provide information and influence, but qualifies that influence is "much less likely" to come from weak ties (p. 1372). Despite the meaningful difference in flow of communication of information or influence, both toward the ego and to the potential source of job, and the level of activity required of different actors (i.e., job seeker versus knowledgeable/connected contact), only two-studies have directly examined the distinction between information and influence in the job search context. Yakubovich's (2005) study of Russian job seekers asked whether contacts provided information, in relation to a helpful party, or direct influence on the hiring process and Smith's (2012) study examined hiring practices of staff positions at a university. Findings from these studies are detailed in the paragraphs that follow.

Yakubovich (2005) reported the first research testing the differences in terms of information and influence when it comes to tie strength. Specifically, Yakubovich (2005) used interview data with Russian job seekers and found that among all sources used by job seekers, 47% involved information, 22% involved indirect influence (friends of friends or more distant relations), and 31% involved direct influence (influencing one or more people in charge of hiring). For those who actually obtained jobs, 54% of jobs came from information, 20% from indirect influence, and 26% from direct influence. However, while weak ties were more likely to lead to employment, when sources providing information or influence was entered into the model (along with demographic variables), indirect influence was negatively related to successful job attainment and direct influence was not a significant predictor of finding a job. Yakubovich (2005) takes these complex findings as proof that weak ties are the primary

source of job information, but leaves the question of influence versus information largely unanswered.

Smith (2012) sought to qualitatively disentangle the information and influence distinction. Though strong personal ties can carry the costs of conveying information to employers, and the costs associated with "sticking their necks out" and even "serve[ing] as advocates" when it comes to recommending a contact (Marsden & Gorman, 2001, p. 470), the findings by Smith (2012) (and Marin [2012]) suggest that strong ties are often not willing to assist job seekers. As Smith contends many participants were eager to share information with weak ties but reticent to share with strong ties. Further, Smith (2012) finds that job information holders are more willing to follow-up on applications submitted by weak ties (i.e., relative strangers), a form of influence. Thus, evidence suggests that SWT could be wrong in suggesting that weak ties are far less likely to exert influence.

This tension is summarized well by Smith's (2012) conclusion that strong ties are both liabilities and assets because they are known better job information holder. The intimate knowledge that comes with strong ties may allow for effective job matching (Marsden & Gorman, 2001). Alternatively, close relational partners may be known too well and recommending them can be a liability (i.e., the job information holder asks, "how would hiring this person reflect on me?"). In contrast, weak ties are less likely to reflect poorly on a social connection and sharing with weak ties does not imply a knowledge about job fit or a match to the job seekers' skills or abilities. Thus, a weak tie who is hired and performs poorly is a minor mistake for the information sharer; in contrast, a strong tie who performs poorly might be perceived as a major misstep. In all,

the motivations for sharing job information and for exerting influence are mixed for both strong and weak ties. Chapter 4 tackles the contradictory roles of weak and strong ties as they relate to influence and information sharing.

Correlates of SWT

Granovetter (1995) summarizes the major correlates of the use of weak ties for job searches. Finding a job through contacts (regardless of tie strength) is negatively related to age, education, and occupational status. As a person builds occupational status, it makes sense that personal contacts would be less necessary in assisting job transitions; as a person becomes higher status, there are fewer higher status others to rely on for guidance (Lin, Ensel, & Vaugh, 1981). The findings regarding age and education are consistent with the findings of Blau and Robbins (1990). Specifically, as the level of education increased so did number of contacts, number of search methods used to find a job, and the number of offers; however, education was unrelated to acceptance rate of offers. Montgomery (1992) reminds researchers, "the entire network structure of individuals must be taken into account, rather than controlled away" (paraphrased by Granovetter, 1995, p. 149). Contacts are important, but a holistic picture of what sources are used and to what end better is needed to explain the role of communication in finding jobs. Thus, the purpose of Chapter 3, the first study of this dissertation, is to explore the relationships between uses of various methods during the modern job search process.

There are also limits to the SWT position. SWT does not predict quality of jobs or other work-success outcomes. This theory strictly deals with likelihood of novel and useful information coming from others who are connected to different sources than the

self. It is worth noting that Granovetter (1983) claims that a negative relationship between use of weak ties and income is, "opposite to the predictions of the weak-tie hypothesis" (p. 207). Thus, it is inappropriate to compare wages, job quality, fit, or other outcomes under the theoretical framework of SWT. SWT just suggests that because our weak ties are less likely to know our other contacts, are particularly numerous, and more likely to be in different social groups, they are a likely source of novel job information. Despite the disconnect between SWT and monetary or job quality related outcomes, scholars have pursued the economic correlates of strong and weak ties usage (see Lin et al. 1981; Montgomery, 1992; Van Hoye et al., 2009). Consensus is now in line with Lin et al.'s (1981) findings that weak ties are related to increased occupational status to the extent that the tie is of higher status than the self (the nuances of tie status are explored in the study detailed in Chapter 4).

A final caveat for SWT is provided by Granovetter (1995). He argues that researchers are obligated to include those who are not actively searching for a job in tests of SWT (Granovetter, 1995). As Marsden and Gorman (2001) explain, those who are not actively seeking a job but find one are "almost by definition" utilizing social contacts (p. 472). Lin (2008) reiterates, that some of the most common ways to find a job when not actively searching is through contacts. In fact, much of the contradictory SWT research comes from studies using the Current Population Survey (CPS; Bortnick & Ports, 1992; Ports, 1993) which does not include individuals who are already employed. Consistently, CPS data and data using the same scales reported in the National Longitudinal Study of Youth (NLSY) find that ties are no more important than other sources, but these sources neglect job seekers who are not active in search

method. Granovetter (1995) and Marsden and Gorman (2001) clarify that CPS/NLYS findings are an artifact of data collection method, not a reflection on SWT. Thus, the mixed evidence on SWT touted by Mouw (2003) and others may be more an issue with different outcomes and measurement than a disconfirmation of the original theory. In fact, some of the most comprehensive examinations of SWT demonstrate that the most likely source of a job is a person's weak tie (Gee et al., 2017).

The Forbidden Triad

Granovetter's (1974, 1983) early theorizing relies, in part, on the notion that strong ties are likely to know one another's contacts (i.e., create closure or transitive triads in the network) whereas weak ties are often intransitive, that is triads which are not transitive; for example, *i* and *j* are a strong tie, *i* and *k* are a strong tie, but *j* and *k* have no tie. The situation just described is referred to as the *forbidden triad* (Granovetter, 1974). Though much research has supported the claim that forbidden triads are rare, there is also evidence that, in some cases, strong ties may be intransitive (i.e., not know each other; Bian, 1997; Burt, 1992; Smith, 2012). Depending on the source and estimation method, there remains much debate about the prevalence of forbidden triads; most evidence suggests there are times when forbidden triads do occur (for example, it is not unusual for friends and relatives to not know each other [Bott, 1957]), but in general, network closure is a powerful norm and the forbidden triad remains forbidden or disconnected. As Burt (2005) contends, when it comes to naturally occurring organizational networks, "a friend of a friend is a friend…an enemy of a friend is an enemy" (p. 125).

The reason weak ties remain useful is that they connect the ego to unknown

others. Research using cellular phone logs for approximately 20% of an unspecified nation's population demonstrates the bridging capabilities of weak ties (Onella et al., 2007). As weak connections (specified by examining duration and reciprocity in calls across two months) were removed from the network, the structural cohesion (the number of actors that need to be removed in order to disconnect a group) decreased dramatically; whereas, when the same procedure was conducted using strong ties, the network remained largely intact. Thus, weak ties are, at minimum, a correlate of bridges and at most, the source of bridges in naturally occurring networks.

Answering the Forbidden Triad: Structural Holes Theory

The elegance of SWT comes in the intuitive and mathematically probable relationships it suggests: there are proportionally more weak ties in one's social networks and weak ties are far more likely to bridge to disconnected parts of one's network (Granovetter, 1995; Montgomery, 1992). Though an ego's strong ties may not know one another, they are more likely to get to know one another than are weak ties. Burt (1992) acknowledges the rare but possible nature of strong ties that bridge to new information and answers the idea of a forbidden triad by introducing Structural Hole Theory (SHT). SHT posits that contacts, of any strength, who are *non-redundant* (that is they have access to unique information, resources, and unknown others) provide a competitive advantage because of their unique position.

Though the idea of a structural hole is quite similar to SWT, the important difference is that structural holes can be crossed by both strong and weak ties. As long as a contact is not transitive (i.e., does not connect to known others) and is not structurally equivalent to others (provides different information that is not already

available through another social connection), it is possible for the tie to cross a structural hole. Restated, a tie that bridges a structural hole can be strong or weak, "tie strength is a correlate, not a cause" (Burt, 1992, p. 27). For instance, my father in-law's fishing partner and best friend (a strong tie) is the regional manager of a major retail store. If my father-in-law lost his job in manufacturing, his friend could easily connect him to a position in the retail industry, though my father-in-law has no direct connections of his own in this industry.

As Burt (2005) explains, there is a competition between the benefits of a structural hole and the benefits of a tightly connected network. Structural holes are separations in a network between non-redundant contacts. Formally, *structural holes* are bridged by ties that "separate non-redundant sources of information, sources that are more additive than overlapping" (Burt, 2005, p. 16); thus, structural holes can be crossed by both strong and weak ties as long as the social connection has access to unique information. More than the chasm between two otherwise disconnected groups, Burt (1992) explains, the *bridging* function of a structural hole is "at once two things. It is a chasm spanned and the span itself" (p. 28). Like physical bridges crossing an otherwise impassible span (e.g., a river, a canyon), network bridges connect across structural holes. Though having a more disconnected network seems disadvantageous, actors who connect others are in a position to accumulate resources (Burt, 2005). These actors serve as gatekeepers for information. As Burt (1992) explains, having access to what one already knows is not a competitive advantage, having access to novel information is an advantage. Bridging a structural hole is the network equivalent of, "I know something you don't know" or "It's not what you know but who you know and

who they know." The benefits flow both to the person who bridges and the network actor who knows the bridge.

The general focus of the SHT position is the benefits social structure can provide to an ego. At the individual and network level, spanning structural holes has the potential to be both beneficial and harmful. For the individual, closing structural holes can be an efficient and effective mode of resource exchange. As detailed above, an individual who has access to unique resources has a benefit over someone who cannot access such resources. At the network and individual level, reductions in redundancy increase efficiency because they save on time, money, emotional investment, and other costs associated with maintaining relationships (Burt, 1992). That is, information in a tightly knit network can flow quickly. However, a network with many structural holes is a network with many disconnections; thus, there are only a few paths between any two points but it is easier to get from any connected point-to-point. For network actors, including job seekers, recognizing individuals who fill structural holes can be an effective way to traverse the network. When alters are perceived not only as contacts but also as valuable access points to the unknown, each ego is able to more effectively and strategically communicate (Burt, 1992). Still, this "optimized network" has network members considering each other as resources, not human communication partners. The strategic and coincidental uses of social contacts, and other sources during a job search, are the central focus of both Chapter 3 and Chapter 4.

Closure and SHT. In contrast to structural holes, networks also benefit from *closure* and increased transitivity. Closure is beneficial because it fosters trust and facilitates interaction with already maintained relationships. Specifically, Burt (2005)

demonstrates, using a network of bankers, that trust is the result of network closure across time. The longer two actors know each other, the more likely they are to trust; further, when two actors are in a more closed network, the longer they know each other, and the more trust is reported in the relationship. One reason trust is facilitated in existing and closed relationship is because information about those whom an actor already knows well is "cheap, richly detailed, and probably accurate" (Granovetter, 1992, p. 42). Reputation comes from relationships—and closure forms a tautological relationship such that trust and mutual confiding in the past generally predict trust, reciprocity, and mutual confiding in the future (Burt, 2005).

Burt (1992) contends that many weak ties are redundant because of the likelihood of weak ties having access to the same information; restated, because weak ties are so numerous they are also likely to be transitive and, thus, relay redundant information. In all, while a greater proportion of weak ties are likely to be bridges, many weak ties cannot provide novel information. Thus, the first articulation of SHT (i.e., Burt, 1992) generally ignores the benefits of closure, preferring to highlight the effects of unique information flow. The argument forwarded in SHT is that weak ties alone are not useful to actors: weak ties (and strong ties) that span structural holes are useful. Further, strong ties can be beneficial to the extent they can span structural holes.

The problem SHT makes evident is that SWT cannot account for the way actors favor existing strong relationships; that is, there is a "widespread preference of all economic actors to deal with those they have dealt with before" (Burt, 2005, p. 99). SHT theory, on the other hand, can account for these relationships and their benefit by claiming that some structural holes are bridged by close relational partners (i.e., strong

ties). For this reason, in Granovetter's (1983, 1995) restatements of SWT, he takes a softer stance on the necessity of weak ties and emphasizes the role of connections to otherwise unknown others. Granovetter (1983) reiterates, weak ties are only useful to the extent that they provide new and non-redundant information. Therefore, while the remaining chapters often reference SWT, the SHT argument (that weak ties are only beneficial to the extent that they provide a bridge, and that strong ties can be bridges) should be recognized as an underlying assumption of SWT theory.

Because of the incompatibility of SHT with the beneficial effects of *closure*, Burt (2000; 2005) reframed SHT as a method for understanding social capital. Social capital theorizing allows researchers to have their cake and eat it too. That is, the information benefits of both strong and weak connections (i.e., of closure and structural holes) are both crucial to navigating social networks (Lin, 1999; 2001). As Burt (2005) explains, "Closure is a compliment to brokerage such that the two together define social capital in a general way in terms of closure *within* a group and brokerage *beyond* a group" (p. 7, emphasis added). The next section presents the syntheses of social capital research.

Social Capital Theory

While SHT generally focuses on potential benefits to an ego, social capital expands on the work of SWT and SHT to posit that network-wide benefits accrue through both brokerage and closure. The first and most cited structural definition of social capital was forwarded by Bourdieu (1985), "the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (p. 248). Lin

(2001), a leader in modern social capital research, defines it as "how individuals access and use resources embedded in social networks to gain returns in instrumental actions (e.g., finding better jobs) or to preserve gains in expressive actions" (p. 21). Much of tension in social capital research lies in the dynamic interplay between strongly connected networks which share a great deal of resources and loosely connected networks which have access to a wider variety of resources. As Lin (1999) explains, "to argue that closure or density is a requirement for social capital is to deny the significance of bridges, structural holes, or weaker ties" (p. 34). Despite Lin's argument, many studies do not distinguish a close partner from a distal relational partner in assisting job searches (see discussion of CPS and NYLS data above and in Chapter 3). Instead, much research on the social contacts used by job seekers focuses on social capital *writ large* aggregating all social connections available to one individual (Chen, 2014).

Social capital theory subsumes SHT and claims that SHT takes too narrow an approach to account for broader network benefits. For example, Putnam (1995) defines social capital as "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit" (p. 67). In contrasting ego-beneficial social capital and whole network capital, Adler and Kwon (2002) add that social capital can be conceptualized as *internal* (related to the connection of the ego to others), *external* (the connections others, especially weak ties, have outside of the relationship with ego), or both. Thus, Adler and Kwon (2002) present a "both" definition of social capital as "the goodwill available to individuals or groups. Its source lies in the structure and contents of the actor's social relations. Its

effects flow from the information, influence, and solidarity it makes available to the actor" (p. 23). Rather than focusing on a purely internal or external approach to social capital, the following sections utilize the broad definition including both forms of capital.

Though some scholars compare social capital to monetary capital, social capital "in all its forms, is a relation, not a thing" (Adler & Kwon, 2002, p. 27). Social capital is generally considered to be a benefit to both an ego and the network of any given ego. The sources of capital, motivations, and differentiated ability of actors utilizing social capital remain quite contested (for a review, see Adler & Kwon, 2002). At the heart of these arguments, it is clear that when it comes to social capital, "the devil is in the details" (Kadushin, 2012, p. 182). As an example, the differences between Putnam's (2000) view of declining social capital and the optimistic views forwarded by many modern Internet researchers relies as much on how social capital is defined as it does on how social capital is shifting. Burt (1992) reminds scholars to focus on the specific network dynamics, rather than definitional explanations that cannot be demonstrated.

When it comes to network research on both SHT and social capital, it is obvious that both perspectives assume the "effects of network structure" are the driving force behind choices made by actors (Adler & Kwon, 2002, p. 25). This very nuanced flavor of a rational actor model denies much free will; instead, both social capital and SHT focus on how networks facilitate the logical choices for actors. Zey (1992) explains, assuming humans act only in self-interest, know all available information about a problem, and know the range of available solutions is an inadequate description of the complex reality. Adler and Kwon (2002) agree and urge researchers to incorporate

multiple motivations as potential sources of actor decisions. The focus of Study 2 in Chapter 4 is disentangling the mixed motivations of job seekers as they choose (not) to use their contacts.

The problem with the various conceptualizations of social capital is that they come from opposing network tendencies. Social actors not only rely on those with whom they are close, but also benefit from those who are not connected to others the social actor knows. Because of their benefits, both cohesion (increased connection between network actors) and structural holes (connections to otherwise inaccessible others) are claimed by social capital scholars to lead to increased overall capital. Further, both positions assume that network actors will utilize the available networked resources (Adler & Kwon, 2002). Because of this assumption, Kadushin (2004; 2012) and others have concluded that the concept of social capital has little meaning outside of the idea that "social networks have value" (2012, p. 181). The problem is that even if actors are part of a loosely populated network with structural holes and part of a densely populated network with closures at the same time, it is impossible for network actors to see all available opportunities (Burt, 2010).

Lin (1999) attempts to disentangle the concept and concludes, "my own view is that if it is assumed that social capital attempts to capture valued resources in social relations, network locations should facilitate, but not necessarily determine access to better embedded resources" (p. 36). It remains unclear how one could measure network resources and outcomes to decide if social capital is at work or not, although Lin recommends testing both network structure and embedded resources. Social capital remains difficult to measure meaningfully without adopting conceptions of tie strength.

Study 2, in Chapter 4, adopts Lin (1999) and Burt's (2010) contention that both network structure and human decision determine network use. That is, structural bridges and perceived tie resources work in concert as job seekers make utilization choices in their networks.

There is no doubt that the use of the Internet has changed the dynamics of social capital. Social Networking Sites (SNSs) have become a popular venue in which scholars investigate perceived social capital. This is because SNSs provide opportunities to connect to others in a variety of ways. The use of Facebook has been shown to positively relate to bridging, bonding, and maintenance social capital (Ellison et al., 2007; Ellison et al., 2014). However, Ellison et al. (2014) found that perceptions of bridging social capital and actual number of friends varied meaningfully since "users with fewer actual friends reported higher perceived bridging social capital—both Facebook-specific and general—than users with more actual friends" (p. 867). Perhaps this is because when asked to recall a network, individuals are generally unable to recall structural holes (Freeman, 1992). Indeed, for an individual to have birds' eye view of their own network is very difficult: guessing the structure of one's own network is like being a meteorologist by simply looking out the window. A network actor can see no more than one to two others away (Bruggeman, 2016), thus they cannot know who has access to or possesses the best resources available in their network.

Having contacts versus using contact. Lin (2001) points out that having access to resources and mobilizing resources are not always coincidental. Some people have access to information but fail to mobilize networks; others may lack access but call on all available resources. In fact, Obukhova and Lan (2013) demonstrate that network

composition and utilization lead to different outcomes during the job search process: network composition speaks to resources available while network utilization predicts success during a job search. Having access to resources is the basic assumptions of networks, but using resources complicates network utility. Specifically, using social network resulted in more interviews, offers, and acceptances than when job seekers did not call on network resources. Obukhova and Lan (2013) conclude, "if the job seeker actually submits an application through contacts, search through contacts is comparable only to applying to employers where a student has previously had an internship—a comparatively rare situation…" (p. 2214). Though Obukhova and Lan's (2013) findings are encouraging, the wording of this sentence highlights a major problem in much of the research on use of contacts during the job search: the equivalent treatment of referrals and information via contacts. The following section details some findings from this undifferentiated perspective on contacts.

Organizational benefits of using contacts. Research in the job search context using social capital or social connections paint a broad picture with findings: contacts are important (Marsden & Gorman, 2011; Mouw, 2003). How and why they are important remains relatively unanswered, though most scholars agree occupational or social status of social connection is important (Lin et al., 2014). Not differentiating the role of contacts obscures the mechanism at work in informal job search methods (Chen, 2014; Mardsen & Gorman, 2001). But much evidence supports the idea that contacts are more useful than formal methods in finding jobs and promoting person-organization fit. Marsden and Gorman (2001) summarize the benefits of using social contacts (not just weak ties) for both the organizations and potential employees:

> Informal methods are widely believed to yield higher-quality applicant pools, to provide richer information leading to better organization—employee matches, and to recruit employees integrated into existing workplace networks, which in turn speeds adjustment to new workplaces and heightens performance. (p. 481)

This finding is reflected well by Addison and Portugal (2002) with data from Portugal showing that retention is much higher for those who find jobs via social contacts than via other means. Fernandez, Castillo, and Moore (2000) find that the referred new-hire is more likely to stay longer with an organization than a non-referred employee, unless the referrer leaves. Additionally, individuals are more likely to receive an offer and accept an offer for jobs found through contacts than jobs found through formal means (Marsden & Gorman, 2001).

Fernandez and Weinberg (1997) found that referral applicants provided the company better application materials and are more successfully employed than those who apply based on formal means. Fernandez et al. (2000) found that firms using social contacts saved money because of reduced costs from screening, hiring, and training. However, this research also found no differences in knowledge about the company, company knowledge about applicants, or person-job fit relative to non-referrals. In all, the evidence that social contacts are beneficial to employees and to organizations is apparent, as detailed above, but the role of tie strength is unclear and questionable. The role of the contact (as information source, intermediary, recommender, employer, etc.) still remains ambiguous in the literature. Further, most studies fail to distinguish between strong and weak ties (despite the widespread citation of Granovetter). The last section of this theory review, below, describes a contingency perspective on the job search using social contacts that guides the two studies which follow.

Contingencies and contact use. Lin (2001; 2005) advocates for a contingency perspective of contact use based on two purposes of social capital: instrumental and expressive. *Instrumental* uses of social capital are the use of a network to obtain a new or additional resource (like getting a job). *Expressive* uses of social capital are used to preserve or maintain existing resources. Lin (2005) explains that the use of social capital for instrumental purposes is quite complex and depends on the availability of a person's network and the ability to leverage close and distant social connections. Indeed, the contingency perspective acknowledges that varied networks, network-usage skills, and circumstances all lead to different outcomes. A contingency model, offers the ability to avoid false dichotomies of SHT and social capital perspectives that suggest trust and closure as the most beneficial source of social capital. Instead, postulating contingencies allows organizational research to benefit by overcoming the "tendency to bifurcate our social capital research into a strand focused on external, bridging social capital and a strand focused on internal, bonding social capital" (Adler, & Kwon, 2002, p. 35). A contingency perspective of social capital can explain why (and under what conditions) both strong and weak ties can be differentially effective during the job search process. Thus, Study 1 explores the correspondence of source usage during the job search. Study 2 (Chapter 4) extends the contingency view of social capital to explore what benefits are made available to job seekers through which type of tie.

Theory Summary

All in all, the complex (and potentially contradictory) explanations forwarded by social capital theory (SWT, SHT, and social capital research) raise as many questions as they provide answers (for a review, see Burt, 2000, 2005; Lin, 1999; 2000). Complex

mechanisms of brokerage and closure at various levels of networks predict how and when social contacts are beneficial (Burt, 2005), but the exploration of these two competing frameworks has not been extended to the original job search context. Further, the availability of social capital is in question with ubiquitous use of the web and mobile devices to maintain contacts. The evidence from social capital research does not generally differentiate strength of ties between job seekers and social contacts, but suggest the use of contacts to find a job is beneficial for both employers and newly hired job seekers. The complex mechanisms underlying the success of using contacts require additional investigations (Burt, 2000).

The composition of a job seeker's social network is shifting with the availability of the Internet. The next two chapters present two studies designed to explore how the use of new platforms available online is changing the nature of job seekers' social networks. Using the groundwork laid by these theories (i.e., SWT, SHT, and social capital), competing evidence and new evidence surveying Internet use during the job search are utilized to generate and test research questions and hypotheses. Chapter 3 presents Study 1, which focuses on how job seekers find jobs especially in light of the sources modern job seekers use. Chapter 4 lays out Study 2, which inductively generates a contingency perspective, based on past evidence, to explore why job seekers turn to each source and under what conditions.

Chapter 3

The Changing Nature of Job Search Behavior:

An Exploratory Study

The growth of the Internet and the proliferation of ubiquitous computing have brought many changes in both work and home lives in the United States (Edley & Houston, 2011). In fact, there has been much debate about how and to what extent the Internet has changed people's social connections. As detailed in Chapter 1, the average size of Americans' core discussion networks is shrinking; however, the Internet does not seem to be the source of this reduction in network size. In fact, heavier Internet users tend to have larger social circles than non-users (Boase et al., 2006; Hampton et al., 2011). Though weak ties are not fundamentally changing, their accessibility has increased with the always-on Internet; for example, weak ties do seem to be able to provide accessible support in some new media platforms (Rozzell et al., 2014; Wright, Rains, & Banas, 2010). Further, online platforms have enabled users to turn latent connections into weak ties cheaply and easily (Haythornthwaite, 2002). Thus, though the number of close contacts seems to be declining (Boase, 2008), Internet users have the ability to quickly add and replace weak ties (Boase et al., 2006; Chen, 2014; Haythornthwaite, 2005).

Though Americans have a smaller core network of contacts than they had in the past, strong ties are still a fundamental unit of American's social networks and may even be made stronger through additional media usage. If any conclusions can be drawn, research suggests that contact with strong ties has benefitted from additional forms of connectivity across multiple media (Haythornthwaite, 2002). Given the

changing availability of weak and latent connections, this exploratory study utilizes a nationally representative dataset from the Pew Internet and American Life Project (detailed in, Smith, 2015) to examine how the modern job seeker uses available resources (including those available online) during the job search process. This survey has novel questions about job seekers' use of social networking sites (SNSs) and the Internet in general as part of the search process. This chapter reviews past research to construct hypotheses and research questions about the sources recent job seekers utilize. Following the literature review, a method for examining different uses of ties and results are presented.

Recent evidence suggests that both formal and informal means of job information seeking are becoming available online. *Formal means* include finding job postings, information about companies, and other directly accessible information. *Informal means* refer to social connections, including access to close friends and family and distant acquaintances or coworkers, which are available both on and offline. Some media do not fit easily into this classification. For instance, Glassdoor.com and Indeed.com consists primarily of informal information posted by current and past employees but may also include content sponsored by the organization. Similarly, Craigslist.com may include content where people vent about their jobs, an informal use, but ads posted by companies likely serve as a formal means of job information. These new forums for job information are growing in size. Kroft and Pope (2014) report that the number of Craigslist ads between 2005 and 2007 across several cities has outnumbered print advertisements of jobs. Pew Data from 2000 to 2015 shows a steady increase in uses of the Internet to search for jobs (see Table 1).

Table 1

Job Search Online

Have you ever used the Internet to search for a job?

Date	Have done this	Have not done this
June 2015	62%	38%
May 2011	56%	43%
May 2010	54%	46%
April 2009	52%	48%
May 2008	47%	53%
August 2006	46%	54%
January 2005	44%	56%
June 2004	42%	58%
May 2003	43%	57%
March 2003	44%	56%
March/May 2002	47%	53%
March 2000	38%	62%

Note: Data from nationally representative Pew Research Samples, as reported in Smith (2015)

Despite the increase in availability of online job resources, thus far, studies have not been able to "assess directly whether the Internet has had an impact on the mix of job search methods used by workers" (Kuhn & Mansour, 2014, p. 1215). Though Kuhn and Mansour found that, as of 2008, recent job seekers were more likely to find jobs if they used the Internet as a source, the evidence has been quite mixed. Longitudinal research comparing 1998 and 2000 suggests that use of the Internet provides a small but significant advantage in job attainment (Fountain, 2005). Working on the same data, Kuhn and Skuterud (2004) found that when factors associated with reduced unemployment (e.g., home ownership, race, education) are included in analysis, the effects of Internet use during a job search disappears. More recent evidence suggests that Internet use leads to reduced unemployment duration (Kuhn & Mansour, 2014; see the "Internet Use During a Job Search section below). Thus, evidence is mixed regarding the extent use of the Internet benefits (or even deters) job seekers.

A Profile of the Job Search Process

Because the Internet is an important source of job information, the dichotomy of formal and informal job sources may not sufficiently describe the sources used by job seekers. Thus, the original conception of SWT may not be replicable today when the social web is taken into account.

Granovetter (1995) reported the 1973 data showed that 56% of jobs came from personal contacts, 18.8% formal means (9.9% advertisements and 8.9% "other" formal means), 18.8% direct application, and 6.7% from miscellaneous. Recent research using proprietary Facebook data combined with psychological measures shows that those who recently lost a job are more likely to find a job within three months if they interact with

strong ties more online (Burke & Kraut, 2013). Specifically, the researchers use both self-reported and interaction-based measures (r = .66) of tie strength to predict the likelihood of finding a job within three months (Burke & Kraut, 2013). Communication with weak ties on Facebook was unassociated with finding a job, while communication with strong ties was positively associated. Follow-up evidence using proprietary Facebook data challenges this finding, showing that because of their numbers, in absolute terms, weak ties are more likely to provide a job; at the same time, because of their willingness to intervene in hiring practices, strong tie use is more predictive of actually finding a job (Gee et al., 2017). Restated, the observed number of strong ties helping with jobs is higher than expected, but the quantity of jobs found through weak ties is much larger than those found through strong ties. Though seemingly contradictory, these findings align with the predictions of SWT (Granovetter, 1983). In sum, the findings on SWT and online social network use suggest benefits from both strong and weak ties.

Clearly, the evidence from research on SWT shows that sources are not used in isolation: both strong and weak ties are useful. Further, many individuals find jobs through non-social sources like direct application, newspaper postings, etc. Still, Van Hoye et al. (2009) conclude "networking, print advertising, Internet, and public employment service were only moderately correlated (R's varied between .15 and .34; see Table 1), supporting their relevance as *separate* search behaviors" (p. 678, emphasis added). However, other studies call into question the logic of differentiating sources. In the age of social Internet (or Web 2.0 and beyond; or crowdsourcing), it may still be the case that "personal contacts are of paramount importance in connecting people with

jobs," but the accessibility of alternatives changes in complex technical communication systems (Granovetter, 1974 [1995], p. 22).

As outlined above, Stevenson (2009) and Kuhn and Mansour (2014) provide evidence suggesting that job searches using the Internet along with other sources lead to faster job attainment. Recall that Stevenson (2009) concludes the number of sources utilized during job searches has increased over the last 20 years. An important question that remains unanswered in SWT research is how are sources used together to attain a job.

Past research suggests that source or communication channel utilization follows a logical structure. Katz, Rice, and Aspden (2001) report that increased telephone use coincides with more dispersed social interactions among early Internet adopters. Haythornthwaite (2002) contends that face-to-face interactions are often a supplement to online communication. That is, first individuals communicate digitally, and then they move to other channels. The evidence suggests that use of online resources leads to additional face-to-face interaction as well. When it comes to a job search, the use of multiple media is likely associated with increases in other interaction as well. The most suggestive evidence of the supplemental use of media with face-to-face interaction comes from Haythornthwaite's (2005) finding that the media use among two different contexts, distance learners and scientists, formed a one-dimensional scale whereby users who, "use only one medium, use the same medium; those who use two, tend to use the same second medium, etc." (p. 130).

Like other Internet users, job seekers likely supplement online communication and face-to-face communication with other, perhaps complimentary, methods of

communication. Understanding which techniques correspond together reveals more than just the coincidence of overlapping methods; it can show which methods are paired by job searchers. A typology of source utilization has not been explored in the job search context. Thus, the following research question is posed:

RQ1. Which job search methods are used in combination by modern job seekers?

Use of Multiple Methods During a Job Search

Holzer (1987), using the National Longitudinal Survey of Youth (NLSY), found that the young job seekers used an average of 3.05 sources. Addison and Portugal (2002) found that participants in their Portuguese study used an average of 2.05 sources and increased number of sources was associated with a reduced likelihood of obtaining a job. Blau and Robbins (1990) found their American participants used an average of 2.06 sources, and also found a negative relationship between number of sources and job attainment. A potential confound in these findings is that number of sources could be related to duration of unemployment rather than source effectiveness. That is, once a job seeker finds a job, that person stops using new sources. These studies, however, were all conducted prior to the proliferation and widespread adoption of the Internet.

When it comes to the modern job search, the use of the Internet has become increasingly central. Stevenson (2009) reports that as the use of the Internet has proliferated in America, the number of sources used in a job search is increasing. Stevenson concludes that the amount of information available to job seekers is increasing across time rising from an average of 2 sources to 2.25 between 1994 and

2003. Whether employed or unemployed, the number of available sources during a job search has increased with increased Internet access.

The techniques used by Granovetter (1974 [1995]) assumed that job seekers primarily utilized one source in obtaining the job; thus, only the most important source was analyzed in the classic study. But, as outlined here and in Chapter 1, recent evidence suggests that the use of Internet sources is an important part of the modern job search and that information sources are generally used in concert, not as stand-alone resources. Specifically, Brouer et al. (2015) explored the use of websites and found that job seekers used Facebook 65% of the time, LinkedIn 59%, Twitter 31%, and resume websites like Indeed.com 46% of the time. Recent evidence the Pew Research Center, using the same dataset this study does, found that among those who searched for jobs in the last two years: 79% used online resources (34% said this was the *most important* source, included in parentheses that follow), 66% close connections (20%), 63% professional contacts (17%), 55% acquaintances (7%), 32% employment agencies (5%), 32% ads in print publications (4%), and 28% other means (e.g., fairs and conferences; 5%). A summary of these statistics is provided in Table 2.

Table 2

Job Search Sources

Source	Used By	Most Important
Print Advertisements	147, 30.0%	11, 2.2%
Other sources	58, 11.8%	18, 3.7%
Job Events	133, 27.1%	23, 4.7%
Employment Agencies	163, 33.3%	29, 5.9%
Personal Acquaintances	280, 57.1%	39, 8.0%
Professional Acquaintances	328, 66.9%	89, 18.2%
Close Friends and Family	324, 66.1%	94, 19.2%
Online Sources	399, 81.4%	132, 26.9%
Social Networking Sites	249, 50.8%	N/A

In this Pew data it is clear that SWT hypothesis is only partially confirmed: the combined categories of weak ties (i.e., professional contacts and acquaintances) account for the largest proportion of contacts used and the second largest proportion of "the most important" sources after Online Sources. The importance of Online Sources signal that SWT is in need a of an update. Further, later in the survey, these respondents were asked if they had used social networking sites during the job search: 41% of job seekers had used these websites during the search. Participants were not given the option to select Social Media as the most important source.

The Pew data and data from Brouer et al. (2015) highlight that individuals are using multiple sources in the job search. While the evidence clearly shows that multiple sources are used by the modern job seeker, many tests of the SWT hypothesis have relied only on the single source model of obtaining a job. Granovetter's original analysis only examines the single source that "secured the job" and Granovetter (1974/1995) reflects that choosing how to classify sources was primarily a researcher's judgment call (see Granovetter, 1995, Appendix B "Coding Rules and Problems").

Though it can be argued that the source used to obtain a job is of great importance, the culmination of all resources utilized provides a more comprehensive view of the job search process. Holzer (1987) explains that the use of multiple methods reflects the extensiveness of a job search. The more extensive a person's job searches, the harder they may be working to find a job. Given these complexities, this study asks:

RQ2. Including Internet sources, (a) how many and (b) what kinds of resources does the modern job seeker use?

Employment Status, Internet Use, and Job Attainment

In a comprehensive review of job search practices, Marsden and Gorman (2001), conclude that it is not networking itself, but "a particular kind of network that provides individual advantages" during a job search (p. 490). That is, weak ties and strong ties are only useful to the extent that individuals leverage their networked set of resources to their advantage during a job search. Obukhova and Lan (2013) report that having access to network resources is not predictive of success during a job search, but network use does predict success of a job search in terms of both offers and acceptances. For example, though I know many people who are capable of proofreading this dissertation, only a few members of my network (namely my co-advisors) have been called on for such a labor-intensive task. In short, having network resources and actually using network resources are related, but very different. As detailed in the previous chapter, while SWT is concerned with the strength of social ties, research based on structural hole theory (SHT) and social capital fails to account for differences in tie strength. Many studies have focused on other differences in sources used by job seekers (e.g., active vs. passive, formal vs. informal) instead of tie strength. The following sections outline past research findings differentiating employment status and source utilization in relation to job attainment.

Source utilization and employment following a job search. Much research on job searches uses the national sample collected annually by the National Longitudinal Study of Youth (NLSY) or the Current Population Survey (CPS) conducted by the U.S. Census Bureau. CPS and NLSY collect their data through a 12-category division of job search methods (and since 2005 also ask if each of the 12 is used online): contacted

employer directly, contacted public employment agency, contacted friends or relatives, contacted school/university employment center, sent out resumes or filled out applications, checked unions or professional registers, placed or answered advertisements, other active methods, looked at advertisements, attended job training programs or courses, and other passive methods. In line with these categories many research articles rely on the CPS/NLSY method to describe job information sources (e.g. Kuhn & Mansour, 2014; Marin, 2007; Mouw, 2003). Thus, much published research on SWT does not differentiate type of contact.

Because employment is the goal of a job seeker, employment status is a suitable measure of the job search outcome. However, the findings about resources used relative to employment outcomes paint a mixed picture. Holzer (1987) found no statistical difference in the use of contacts between employed and unemployed individuals. Differences have been found in sources other than personal networks between employed and unemployed job seekers. Blau and Robbins (1990) found higher use of state employment agencies and direct contact to the employer among those seeking work who did not already have a job; in contrast, the use of private employment agencies was higher for those who were already employed. Addison and Portugal (2002) found little difference in sources used by the employed versus unemployed in Portugal (see footnote on p. 507). Among those who found jobs, Addison and Portugal (2002) did find that retention in jobs was highest among those who used informal contacts. Further, the success rate of obtaining a job (across a combination of multiple methods of search) for use of social connections was the highest as compared to that via direct application, advertisement, examinations, and public employment agencies.

In all, the categorization imposed by the CPS/NLSY data has produced much research that compares formal and informal sources. Many have compared job searches across employment status during search: Employed individuals tend to use fewer sources than do unemployed individuals. Both employed and unemployed individuals are likely to use social contacts; however, individuals who are unemployed tend to also turn to government resources (i.e., employment offices). Across studies, it appears that social contacts are the most frequently used resource during a job search. When job seekers turn to informal contacts, they tend to stay at their jobs longer than those who do not use contacts. The next section explores how a job search is altered as the set of available sources becomes accessible online.

Internet use during a job search. There is little doubt that the proliferation and widespread adoption of the Internet has altered how individuals access job information (van Livens et al., 2002). In fact, approximately 50% of all job search activities reported by job seekers between 2005 and 2008 were conducted online (Kuhn & Mansour, 2014). The Internet provides access to both strong and weak social connections. Specifically, use of the Internet expands both informal and formal job searches by those who have Internet access. Individuals can access formal and informal job information from known (e.g., Facebook.com) and unknown others (e.g., glassdoor.com) as well as companies through both traditional (i.e., company websites, classified ads) and nontraditional (e.g., craigslist.com, monster.com) sources. The Internet fundamentally changes the way we contact virtually all social contacts, job seekers now have access to virtually all informal and formal job search techniques online (e.g., Gee et al., 2017; Kuhn & Mansour, 2014).

In fact, recent data suggests the Internet is largely not used to contact known others. As Kuhn and Mansour (2014) explain, while "22% of offline search involves contacting friends and relatives, this is true for only 6% of online search" in their 2005-2008 data (p. 1219). In line with the shifting landscape of findings that the Internet Paradox (detailed in Chapter 1, i.e., Kraut et al., 1998, and follow-up, Kraut et al., 2002) dissipates as users familiarize with the media, it is quite possible that contacting others online during job searches has increased as users adjust to the new media. Still, social networking sites were a relatively new trend in even the most recent evidence about the use of the Internet during the job search (Kuhn & Mansour, 2014).

The job search data mirrors Kraut and colleagues' (1998; 2001) Internet Paradox findings. Specifically, a marginal increase in unemployment duration among those who used the Internet as a source to find jobs was present in data from 1998 and 2000 (Kuhn & Skuterud, 2004). However, follow-up data, shows a 25% decrease of unemployment duration among those who used the Internet to search for a job from 2005 - 2008 (which the researchers attribute to "improvements in IJS [Internet job search] technology" (Kuhn & Mansour, 2014, p.13). Stevenson (2009) sides with a beneficial view of the Internet use during job searches, finding that Internet uses lead to reduced unemployment duration.

This complex set of sometimes-contradictory findings culminates when looking at the benefits found by Kuhn and Mansour (2014) among those who used the Internet to find a job. Specifically, those seeking a job who used the Internet for formal means, in this case sending resumes and filling out applications, had a 20% increased likelihood of finding a job; in line with social capital research, however, contacting friends or

relatives online as part of the job search increased re-employment rates by 36%. The use of online media to connect with contacts, though rare in 2008, is the most intriguing finding from Kuhn and Mansour's research: contacting others online "appears to be highly effective" during job searches (p. 16). Given recent evidence that Twitter, LinkedIn, and Facebook are common sources used during the job search (Brouer et al., 2015), it is hypothesized that:

> **H1.** Those (a) who use the Internet and specifically (b) social websites as a source of job searches are more likely to be employed than those who do not use these sources during job searches.

Affiliation Networks and the Job Search

Contractor, Monge, and Leonardi (2011) hypothesize that the use of technological resources along with human resources composes a fluid network for a social actor. Specifically, they theorize: "as technologies begin to store greater amounts of information that were once only held in the heads of people, individuals begin to 'use' technologies in much the same ways that they 'use' coworkers and friends" (p. 683). Once a technology has been integrated into the job search process, it makes sense to consider the technology endogenous (inside or a part of) the network rather than exogenous (outside or occurring separate from) to the network; in summary, technology can be integrated into the job search as a particular kind of contact (node), not just a means to access others. Technology can serve as a repository of information and provide access to resources that were previously only available through direct contact with other humans. That is not to say that humans and technologies are indistinguishable; in fact, it is easy for a user to distinguish between humans and

technologies (Pentland & Feldman, 2008). Including technological sources as nodes in social networks enables researchers to disentangle the resources utilized in the job search process and their potentially distinctive effects.

Contractor et al.'s (2011) theorizing suggests that the relationship between human actors and material actors can be conceptualized as an affiliation network between human information seekers and technological repositories. For this study, job seekers could be considered one mode and the available sources used the other. Snijders, Lomi, and Torlo (2013) demonstrate, that during job search processes the preference of two MBA students to share "one employment preference, will also tend to get, or keep, more employment preference in common" (p. 270). That is, the coincidence of listing two potential employers as a desired job source occurred at a rate greater than chance for participants. Restated, Snijders et al. (2013) found that, "there was a significant effect toward four-cycles; if a pair of students has one employment preference in common, then it is likely that they will get more in common" (p. 272). The tendency for four-cycles is "the two-mode version of closure;" that is, a four-cycle signals that the sources being utilized are particularly popular, trusted, or useful in the network (p. 270).

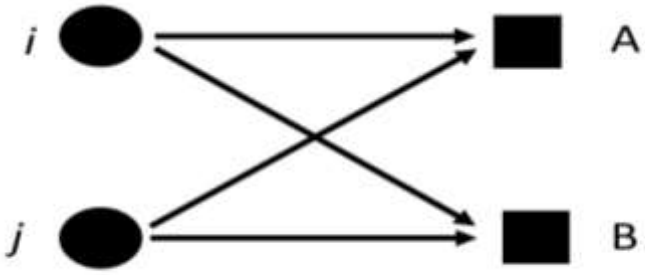
The shared commonality between actors and sources (in this case, employers) is a tendency for four-cycles. A *cycle* is a restricted path from an ego back to itself where "all lines are distinct, and all nodes except the beginning and ending node are distinct" (Wasserman & Faust, 1994, p. 108). Restated, a cycle is determined by examining "the neighborhoods (the points adjacent) of actors. A cycle is a closed walk of 3 or more actors, all of whom are distinct, except for the origin/destination actor" (Hanneman &

Riddle, 2005, p. 47). Cycles occur in a group of three or more nodes when there exists non-redundant route(s) from one node back to itself. Thus, a four-cycle is a relationship between actors and sources such that actors share two sources (two actors plus two sources yields a four-cycle).

As shown in Figure 1, four-cycle relationships posit that two actors *i* and *j* are likely to mobilize the same resources (A and B) in their search (e.g., *i* → A, *i* → B, *j* → A, *j* → B, where A and B represent sources; see Figure 1).

Figure 1

Four-Cycles



Note: Circles represent human job seekers; squares represent job sources

Given the many resources available to job seekers, it is likely that the use of some particular sources coincides with the use of other specific sources (e.g., use of newspaper and employment agency). In fact, if there is a better or worse way to obtain a job, those who are more effective at job searches likely use several sources together that are more effective than the set of sources used by ineffective job seekers. Because the presence of four-cycles signals closure around particular sources in a two-mode network (Wang, Sharpe, Robins, & Pattison, 2009; Snijders et al., 2013), the presence of four-cycles can indicate a preference for sources that are most trusted, useful, and relied-upon during the job search. To test whether sources group together, an exponential random graph model (ERGM) comparing a randomly generated network based on the number of nodes and edges in the observed data to the observed network can be tested (Wang et al., 2009). Therefore, the following hypothesis is proposed:

H2. In the affiliation network of recent job seekers, four-cycles linking job seekers and job information sources occur at a rate greater than chance.

Past research has consistently found differences in job search techniques based on age (Granovetter, 1973), socio-economic status (Lin et al., 1981), and race (Holzer, 1988). Those who are older tend to use less social resources, those at higher socio-economic positions tend to benefit less from use of contacts, and black people tend to have and use fewer social resources. Additionally, women have traditionally held fewer organizational memberships and tend to use contacts less in job attainment (Granovetter, 1995). However, these socio-demographic differences have not been demonstrated in light of the changing demography of the workforce nor in light of the use of technology during a job search. Therefore, the following research question is

posed:

RQ3. What job seeker attributes, if any, are associated with preferences for certain source utilization during a job search?

Study 1: Method

This exploratory study is a secondary analysis of data collected by the Pew Research Center (2015). Pew Research Center bears no responsibility for the interpretations presented or conclusions reached based on analysis of the data. Survey respondents were asked if they had sought a job within the past two years; 30% had (n = 605). These respondents then answered several questions about the job search process (see Measures below). Of these respondents, a subset of 490 (81%) received an additional question asking if they had used social media during the job search. Because of the importance of the use of Internet sources during the job search, this subset of individuals (n = 490, 81% of recent job searchers and 24.5% of the overall sample) is included in the analyses detailed in this chapter. Smith (2015) explains the full sample this data was taken from:

> …a Pew Research Center survey conducted June 10-July 12, 2015, among a national sample of 2,001 adults, 18 years of age or older, living in all 50 U.S. states and the District of Columbia. Fully 701 respondents were interviewed on a landline telephone and 1,300 were interviewed on a cellphone, including 749 who had no landline telephone. The survey was conducted by interviewers at Princeton Data Source under the direction of Princeton Survey Research Associates International. A combination of landline and cellphone random digit dial samples were used; both samples were provided by Survey Sampling International. Interviews were conducted in English and Spanish. Respondents in the landline sample were selected by randomly asking for the youngest adult male or female who is at home. Interviews in the cell sample were conducted with the person who answered the phone, if that person was an adult 18 years of age or older. For detailed information about our survey methodology, see http://www.pewresearch.org/methodology/u-s-survey-research/ (p. 23)

Study 1: Measures. Survey respondents answered questions regarding their current job as well as their job search process. Respondents were asked, "Are you now employed full-time, part-time, retired, or are you not employed for pay?" Fifty-nine percent were currently employed full-time (*n* = 288), 19% part-time (*n* = 95), 4.1% of respondents were retired (*n* = 20), and 14% were not employed for pay (*n* = 70); 17 (3.4%) other participants were self-employed (*n* = 6), disabled (*n* = 4), students (*n* = 2), or did not report (*n* = 4). Participants who were employed at least part time were included in the "employed" group for analysis. Those who were not employed for pay or in other categories were considered "not employed" in analysis.

Participants who had sought a job in the past two years were prompted with the following question: **"**People may use many different resources when looking for a job. Thinking of your MOST RECENT job search, please tell me if you used any of the following resources." The answer options provided were: "Personal connections with close friends or family members," "Personal connections with acquaintances or friends of friends," "Connection with people you know from a professional or work setting," "Resources or information you found online," "Government or private employment agencies," "Ads in print publications," "job fairs, conferences or other events," and "Some other resource I haven't already mentioned." Because the data set does not provide the open-ended response to other resources not mentioned, this category was dropped from analysis (*n* = 73, 12.5%). Following these questions, participants were also asked "Thinking about social media sites like Facebook, Twitter, or LinkedIn have you ever used social media to look for or research a job?"

Participants were next asked to identify what source was most important during

the job search. Because the "other" category did not detail sources, this category was dropped from analysis; only 25 (5%) respondents answered that some other resource was the most important source of job information. Importantly, the use of social media was not one of the available options for the most important source; therefore, it was not possible for participants to rank social media as the most important source. Results are shown above in Table 2.

Finally, the demographic questions asked of participants included gender (male/female), age (a continuous value ranging from 18-96, M = 37.18, SD = 15.13), education (1 = less than high school, 2 = high school incomplete, 3 = high school graduate, 4 = some college, no degree, 5 = two year/associate degree, 6= four year degree, 7 = some postgraduate or professional schooling, no degree, 8 = postgraduate or professional degree), and income (1 = less than $10,000, 2 = 10 to under $20,000, 3 = 20 to under $30,000, 4 = 30 to under $40,000, 5 = 40 to under $50,000, 6 = 50 to under $75,000, 7 = 75 to under $100,000, 8 = 100 to under $150,000, and 9 = $150,000 or more). Race was dummy coded to represent a quantifiable category; specifically, two dummy codes were created: white (white/non-white) and black (black/non-black). Marital status was also dummy coded as married (married/not married).

Study 1: Analysis

Research question 1 asked what sources are jointly used by the modern job seeker. To answer this question, the job seeker and job sources data was reconfigured into an affiliation network with one mode as job seekers and the second mode as information sources. Next, a correspondence analysis was conducted. Correspondence analysis is a "technique for studying correlations among two or more sets of [binary]

variables" in two-mode networks (Wasserman & Faust, 1994, p. 334). Similar to canonical correlations or factor analysis, this technique examines covariance explained by an underlying factor. In this case, the underlying factors were types of job search. Thus, correspondence analysis revealed which methods of job search coincide.

UCINET 6 (Borgatti, Everett, & Freeman, 2002) was used to conduct the correspondence analysis. The analysis revealed the dimensions of joint variance shared between job seekers and sources. Looking at shared variance allowed for the job seekers and job sources to be displayed in the same conceptual space. This analysis showed how actors were different or similar in terms of source utilization "and which actors and events [sources] were located 'close' to one another" (Hanneman & Riddle, 2005). The results generated by UCINET provided numerical distances between each source used by these job seekers. These results showed which sources were closely associated and revealed commonalities in their utilization, yielding a profile or typology of job search.

The output for this analysis yielded values including factor loading values (also called an axes value) and variance proportion values called cosine-squared, which are similar to squared correlations (see Table 3; Bendixen, 1996/2003). Bendixen (1996/2003) recommends including factors with values greater than chance; thus, factors accounting for more than 14.3% ($1/7^{th}$, one over $N_{sources}$ minus one) of variance were included in the reported data. Figure 3 provides a visual representation of variance explained (i.e., cos^2, generated using the *R* package Corrplot) by each source in the four factors. The correspondence model accounts for source utilization at a rate greater than chance, X^2 (4,380) = 4943.53, $p < .001$ with four factors accounting for 64.6% retention rate (i.e., explaining 64.6% of variance). The reported values are UCINET's default

coordinate weighting which adjusts scores for both the marginals and the eigenvalue dimension weights. However, the results with non-weighted values were similar. Hanneman and Riddle (2005) recommend visualization of the data to demonstrate meaningful patterns with correspondence analysis. Thus, the 3D XY Scatter Chart macro (Pope, 2004) was used to visualize the first three factors from the correspondence results in a three-dimensional space show in Figure 2.

From the visualization and values, it appears there were three primary types of job search sources with the fourth factor explaining nuanced differences between types of formal sources. The first factor accounted for 18.5% of inertia (i.e., variance) and mostly accounted for differences between formal sources (i.e., job events, print ads, and employment agencies) and social/informal sources (i.e., professional acquaintances, close friends and family, and personal acquaintances). The second factor accounted for 16.4% of inertia and represented the unique variance of both types of online sources. Specifically, the second factor differentiated both types of online sources (i.e., online resources and information as well as social networking sites) from personal acquaintances. The third factor accounted for 15.1% of inertia and distinguished print advertisements from the other formal means. The final factor accounted for 14.6% of inertia and primarily distinguished employment agencies from job events. Table 3, Figure 2, and Figure 3 depict numeric and visual representations of these four factors.

Though these factors did rely on one another, they also occupied distinct conceptual space. Therefore, the answer to this research question (i.e., RQ1) is that social sources and informal sources are distinct, and distinct from online sources. Further, not all formal sources are the same, with unique inertia accounted for by

distinguishing print advertisements, employment agencies, and job events. All in all, it seems that multiple job sources are used in combination by the modern job seeker. Sources were equally grouped by what was and was not used: social sources were not used in conjunction with employment agencies or print ads (factor 1), sources accessed online were defined by their difference from both formal and social sources (factor 2), print advertisements were distinct from both job events and employment agencies (factor 3), and employment agencies were defined by their association with job events and print advertisements (factor 1) as well as their distinction from job events (factor 4).

Table 3

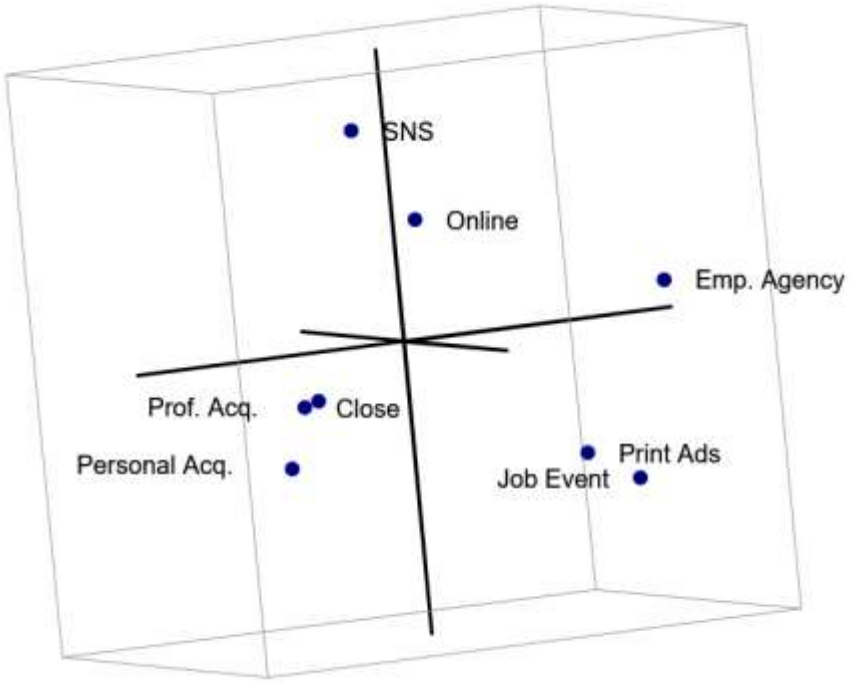
Correspondence Values for Job Information Sources

Source	*Factor 1*	*Cos²*	*Factor 2*	*Cos²*	*Factor 3*	*Cos²*	*Factor 4*	*Cos²*
Print advertisements	0.97	0.45	0.53	0.13	-0.88	0.37	0.27	0.04
Employment agency	0.81	0.38	-0.13	0.01	0.46	0.13	-0.87	0.44
Job events	0.46	0.10	0.49	0.12	0.98	0.47	0.78	0.30
Online resources and information	0.12	0.03	-0.40	0.36	-0.09	0.02	0.05	0.01
Social networking sites	-0.11	0.01	-0.73	0.58	-0.03	0.00	0.34	0.12
Professional acquaintances	-0.31	0.20	0.17	0.06	-0.07	0.01	-0.24	0.12
Close friends and family	-0.38	0.31	0.19	0.08	-0.05	0.01	-0.04	0.00
Personal acquaintances	-0.47	0.35	0.38	0.23	0.02	0.00	-0.05	0.00

Note: These values are coordinates weighted from UCINET 6.6, Cos² from R package FactoMineR refers to percentage of variance accounted for by this sources in a given factor

Figure 2

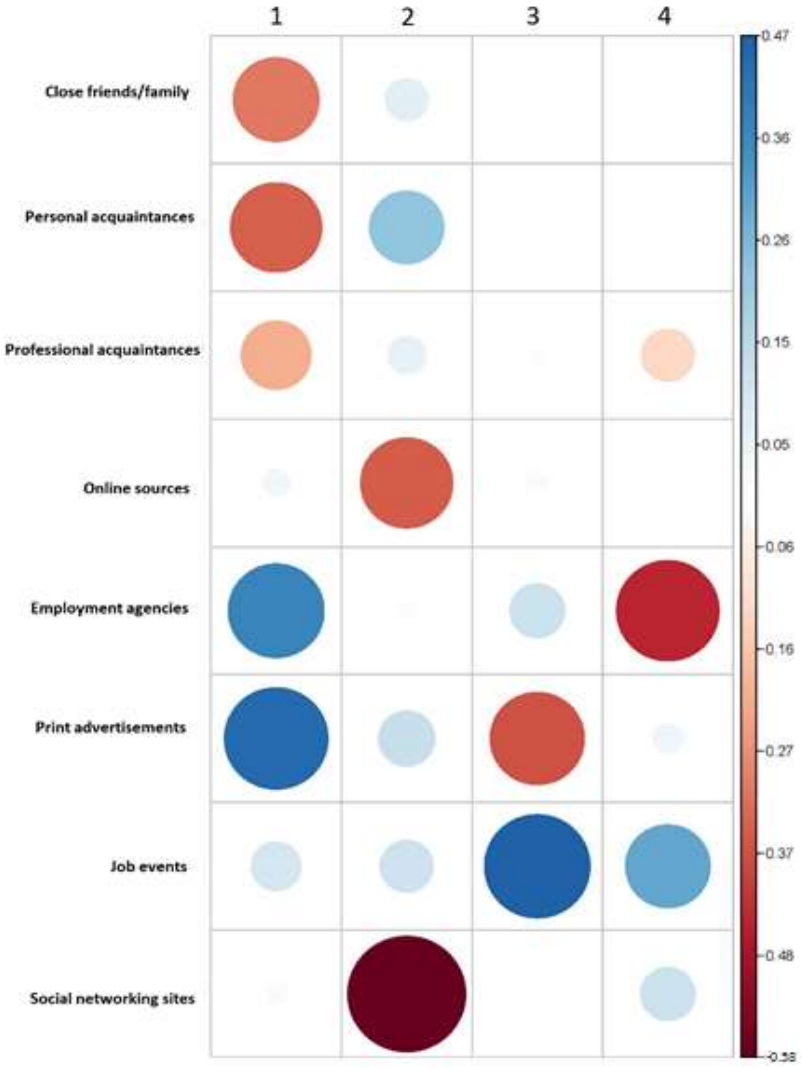
3D Correspondence Values for Job Information Sources



Note: SNS = Social networking sites, Online = online resources and information, Close = close friends and family, Prof. Acq. = professional acquaintance, Personal Acq. = personal acquaintance, Print ads = Printed advertisements, Emp. Agency = employment agency, Job event = job events and career expositions,

Figure 3

Cosine^2 Values for Each Source by Dimension (R package Corrplot)



Note: The Cosine^2 value is indicated by the size of each circle. Color indicates the direction of the loading on each factor. Blue indicates positive loadings while red indicates negative loadings. As shown on the right hand side, Cosine^2 values range from -0.58 to 0.47.

Research question 2 asked how many sources the modern job seeker utilizes during the job search. The frequency of source use for each type of sources is provided in Table 2. The average number of sources used by job seekers in this study was 4.23 (*SD* = 1.88). An acceptably normal distribution (i.e., neither skewed nor kurtotic) of source use was found with only two participants not using any of the sources mentioned and only four (out of 490) participants using all the sources included in the survey. To test for differences in types of sources, the sources were broken into the categories found from analyses for RQ1. Overall, the least used sources were formal sources (i.e., print ads, career fairs, and employment agencies): 57.4% of participants (*n* = 281) used these sources. This signals that the majority of participants used several types of sources. Both online sources and informal or social connections were, however, used more frequently: 86.5% (*n* = 424) used online sources (i.e., online resources and information as well as social networking sites) and 82% (*n* = 402) used social connections (i.e., close friends and family, weak personal, and professional ties). This evidence suggests that formal sources were utilized less than both online and social sources.

Hypothesis 1 predicted that current employment status is related to the use of online sources, and specifically, social networking sites (SNSs). To test this hypothesis, use of online sources and the use of SNS, specifically, were compared between those who were currently employed and those who were not employed using a Chi-Square test for independence. Results showed that neither the use of online sources ($p = .65$) nor SNS ($p = .26$), in particular, were significantly related to employment status. Thus, the use of online sources was not related to employment status in the current dataset.

Post hoc analyses on other kinds of sources were also conducted, to investigate employment status as it related to the use of job search sources. The total number of sources used was exported from the network data (i.e., degree centrality) and then compared between those who were currently employed and those who were not employed using an independent samples *T*-test. Results showed no difference in the number of sources used between those who were employed (M = 4.12, SD = 1.80) and not employed (M = 4.19, SD = 1.95). Further, Chi-Square contingency tables revealed no difference in observed or expected values for any single type of source (close friends and family, p = .81; personal acquaintance, p = .17; professional acquaintance, p = .18; employment agency, p = .72; print ads, p = .27; or job events, p = .20). Thus, in this data, no source was significantly related to employment status.

Hypothesis 2 predicted that four-cycle patterns occur at a rate greater than chance in an affiliation network constructed of job seekers and job information sources. This hypothesis was based on Contractor et al.'s (2011) hypothesis that technological sources can be construed as meaningful nodes in a network when they are used by egos in the same way that human actors are in the network. As Robins and Alexander (2004) explained, affiliation networks occur when at least two types of nodes interact. Affiliation does not occur between actors in one mode but between actors and modes (e.g., corporate executives and boards on which they serve together); thus, though the use of job search resources as a mode is novel, it is not an unexplored type of network analysis.

To test this hypothesis, the affiliation network constructed for RQ1 was used for MPNet's (Wang, Robins, Pattison, & Koskinen, 2014) exponential random graph

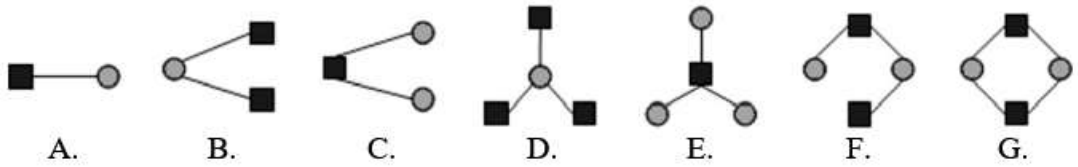
modeling (ERGM) to simulate a network based on the number of nodes and edges present in the observed data (see description of ERGM estimation in the paragraph below). To avoid issues with missing data, participants who did not respond to one or more of the questions were removed ($N = 6$) leaving 484 nodes with 1,999 connections in network. Each connection represents a tie between a job seeker and a source.

ERGM is an "explicit statistical modeling approach" to "incorporate network statistics derived from dependence assumptions about the contingencies among network ties, and permits hypothesis testing about how the local interactive process may impact the global network structure" (Wang et al., 2009, p. 12). The dependence assumptions of the ERGM came from MPNet's Markov and partial conditional dependence estimates. Specifically, geometric weighting using maximum-likelihood estimation (MLE) tests a clustering model for "alternating k-stars and alternating two-paths of two types," both 3-path and four-cycle patterns (See, Figure 4; Wang et al., 2009, p. 24).

A clustering model tested for popularity effects of nodes in the affiliation network as well as local closure, which is signaled by four-cycle patterns. Figure 4 displays the configurations of affiliation clustering and is reproduced directly from Wang et al. (2009). Alternating 2-stars are represented in Figure 4, letter B. (AStar2A; two sources are tied by a single job seeker) and C. (AStar2B; two job seekers were connected by the use of a single source). Alternating 3-stars are shown in Figures 4 D. (AStar3A; three sources, one job seeker) and E. (AStar3B; three job seekers, one source). Relevant to this hypothesis were four-cycles. The configuration on the far right (G. in Figure 4) represents a complete four-cycle; the second from the right (F.) is a 3-path. Additional details of the estimation procedures are available in Wang et al. (2009).

Figure 4

Configurations of Clustering in Affiliation Networks



Note: Circles represent one mode; squares represent the second mode (reprinted from Wang et al., 2009, p. 16)

Contractor (2009) describes ERGM as a "statistical network MRI" to investigate theoretically grounded hypotheses. ERGM compares the observed network with a specified random network (based on specified properties of the network, in this case number of nodes, edges, alternating k-stars, and two-paths; p. 745). Specifically, ERGM allows for statistical testing of network structures relative to randomly occurring structures. Su and Contractor (2011) used ERGM to test for the structural signature of multiplexity between human actors and human/nonhuman information sources. Only recently did the ability to specify and model affiliation networks became available (see, Wang et al., 2009). Significant values of four-cycle patterns would demonstrate job seekers use sources in a non-random way; that is, the occurrence of four-cycle patterns signals that job source use coincides at a rate greater than chance.

The model would not converge when the clustering components were used. Following the instructions provided by the MPNet manual and Wang et al. (2013) each parameter was entered one at a time; however, the model would still not converge. The most complex converging model was the simple edge (parameter = -.53), alternating 2-star from job seekers (AStar2A, parameter = .07), and alternating 3-stars from job seekers (AStar3A, parameter = .06) model. Further, when other structural variables (e.g., 3-paths and 4-cycles) were included, the model would not converge. When node attributes such as age, sex, and race (dummy-coded) were included, though the model estimation took longer and had more plausible values, the model still would not converge. In all, more than 60 versions of the model were attempted, each with no success. Thus, it is not possible to confirm this hypothesis (H2).

There are several plausible explanations for the model's lack of convergence. First, the network was quite full (i.e., of all possible relationships, many are present). The network density score was .516. Further, in examining the data via UCINET's Cohesion analysis, results showed that for every three-path pattern there was a 70% chance ($X_{\text{transitivity}} = .700$) of a four-cycle pattern being present. This was because transitivity equals, "the number of quadruples with 4 legs divided by number with 3 or more legs, in bipartite graph" (Analytic Technologies, 2012). That means among job seekers, there was a very common way of searching for jobs that looked quite similar. Additional investigation of this network revealed that online sources were particularly central with a degree (or number of connections with job seekers) of .81 and a betweenness centrality (or number of instances in which online sources were used in conjunction with other sources) of .35 (the next closest were weak professional ties with a degree of .67 and a betweenness of .17). A full list of the centralities of these variables is displayed in Table 4.

Across each category, it is clear that online resources and information are at the center of the affiliation network for job seekers and information sources. The high betweenness score, 0.35, signals that the single category of online information and resources is the most frequently co-occurring source in actor's job search networks. The closeness score, 0.75, signals that the average distance from any source to online information and resources is very low. In other words, online information and resources are used in conjunction with basically every other type of source. However, close friends and family and professional acquaintances also have high closeness scores (.61 and .62) but are much lower on betweenness (.17 and .18). This may signal that while

social sources are also often used in conjunction with another source, they are not used with several other sources. In contrast, it seems formal sources (e.g., employment agencies, print advertisements, and job events) are used far less frequently in conjunction with other types of sources; the betweenness scores for these formal sources are .05, .04, and .02, respectively.

Table 4

Centrality of Job Information Sources in Pew Data

	Degree	Normalized Degree of Alters	Eigenvector	Closeness	Betweenness
Close friends and family	0.66	0.44	0.44	0.61	0.17
Personal acquaintances	0.57	0.33	0.39	0.55	0.12
Professional acquaintances	0.67	0.45	0.44	0.62	0.18
Online resources and information	0.81	0.66	0.47	0.75	0.35
Social networking sites	0.51	0.26	0.33	0.52	0.10
Employment agencies	0.34	0.11	0.22	0.44	0.05
Print advertisement	0.30	0.09	0.20	0.43	0.04
Job events	0.27	0.07	0.19	0.42	0.02

Note: Degree refers to number of connection; these values match the percentages reported in Table 1. *Normalized degree* is relative to each other source. *Eigenvector centrality* explains how much of the overall differences between ties is accounted for by each source; it is the sum of eigenvalue scores. *Closeness* is the average distance of each source from the other sources given each actor's network. *Betweenness* refers to the number of times a node appears in an actor's network with other sources.

Research question 2 asked what, if any, socio-demographic characteristics related to the affiliation network of job seekers and job resources. To examine what characteristics might correspond with job search source networks, demographic variables and job search sources were recoded to be suitable for regression analysis. Predictor variables included age, education, gender, race (e.g., white, black), and marital status. These predictors were entered into four equations, one for each predictor deemed relevant: degree (i.e., total number of sources used, exported from the affiliation network previously created), online sources (0 = did not use online sources, 1 = used one online source, 2 = used SNS and online sources), use of personal connections (0 = no personal connection, 1 = used one type of personal connections, 2 = used two types of personal connections, 3 = used three types of personal connections), and use of formal sources (0 = no formal sources used, 1 = used one formal source, 2 = used two formal sources, 3 = used three formal sources).

Degree, or number of sources used, was not related to any of the socio-demographic variables used (p = .587). For online sources, the model was marginally significant (p = .058). For social sources, the model was not significant (p = .798). Finally, for formal sources, the model was significant: F (7, 431) = 2.06, r^2 = .037, p = .022. The significant predictors of the use of formal sources were age (β = .110, B = .007, p = .035) and income (β = -.142, B = -.054, p = .009). Thus, those who were older and who have less income are more likely to use formal sources. However, socio-demographic differences do not seem to be present for overall number of sources nor for social or online source use.

Study 1: Discussion

This exploratory study describes the network of job seekers and job information sources using a national random-digit dial dataset collected by the Pew Internet and American Life project. Results revealed a dense network (52% of all possible connections were present, density = .516), in which job seekers used an average of more than four sources (M = 4.23, SD = 1.88). These descriptive results provided heuristic evidence about strength of weak ties (SWT) theory, and demonstrated that online sources are as important as social (human and in-person) sources to job seekers. Personal and professional acquaintances, combined, were still the second "most important" source according to participants (N = 128, 26.2%) to online sources (N = 132, 26.9%). The findings suggest that both the combined categories of online sources (including both resources and information obtained online and websites) and social sources (including strong and weak social connections) are a particularly important source of job information. Despite the prevalent use of many different types of sources, affiliation network analyses and correspondence analysis revealed meaningful factors representing clusters of sources used.

Initially, it is important to note that each source in the affiliation network here just represents one *type* of source, not necessarily one source. In other words, the typology provided in this analysis is about types of sources used together rather than individual sources used together. A job seeker may have referenced several close friends and family and only one online resource. Alternatively, a job seeker may have used 38 webpages but only one career fair, but each type of source represents one connection in this dataset. There are millions of contacts and websites and thousands of

formal sources that could be used by the job seeker. Therefore, this should be thought of as an affiliation network of job seekers and types of sources at the macro or global level (Contractor et al., 2006). This data reflects a network of networks tapped by job seekers.

The ERGM would not converge for the complex parameters (i.e., 3-path and four cycle patterns) specified in this data. Though it may seem inappropriate to interpret the network analysis findings, it is important to note that stochastic network modeling is a computational approach, not a statistical test of difference (Jackson, 2014). ERGM only answers what parameters make the network as probable as possible. The lack of model convergence is as much an artifact of the computational limitations of stochastic modeling as it is of the network structure/formation. In fact, Wang et al. (2009) caution that "models with alternating *k*-stars and alternating two-paths have their limitations, as not all network would have stars and four-cycles of different size weighted geometrically" (p. 24). In other words, when it comes to large networks, like the one analyzed here, model convergence is expected to be a challenge. Therefore, the lack of model convergence is neither surprising nor noteworthy. In all, no inferential conclusions about the prevalence of four-cycle patterns (or three path patterns) can be made from these findings. If four-cycles had been significant, it would signal that the extent to which two job seekers who share one source were likely to share more job information sources in common (Snijders et a., 2012). Thus, the ERGM signals that four-cycles do not occur at a rate greater than chance when comparing all possible networks to the observed network. Despite this limitation, the high transitivity value shows that when a job seeker uses two sources, there is a 70% chance that a second actor will use the same two sources. These findings suggest that the extent of source

overlap is quite high for some sources but not for all. In other words, it seems that job seekers turn to either social, online, or formal sources but the overlap between each of these categories varies from person to person.

The network of job seekers and information source types is dense. In fact, the model that converged showed alternating 2-stars (in which job seekers used multiple sources at once) and alternating 3-paths (in which, job seekers used three sources together) occurring at a rate greater than chance. Coupled with the findings from the correspondence analysis, this shows that when job seekers use a source, they tend to use it in conjunction with similar other sources. These findings reflect the use of sources coincides, but not necessarily that each source or source type provides the same information. As shown in the analysis, each factor was defined equally by positive and negative loading sources. As shown in Figure 3, the positive and negative inertia of each factor reveals source similarities and differences. It would appear that job seekers tend to use a particular kind of source at the cost of not using other types of source.

These results may show a pattern or type of information seeking during the job search. Restated, some job seekers are social job seekers, some are online job seekers, and some use printed ads, agencies, and networking events to find jobs. However, virtually all job seekers turn to several sources during the search. Job seekers would do well not only to search the broad social network (Granovetter, 1973) but also to expand their *types* of networked connections both on and offline. Using a variety of source types may be a competitive advantage for the modern job seeker (Burt, 1992). Granovetter's (1983) update of SWT emphasizes that strong, weak, and moderate ties are all potentially beneficial during the job search. Similarly, the benefits of formal,

social, and online source are all possible (as shown by the "most important" sources list). These findings emphasize the importance of using diverse sources during the job search (and many job seekers did). Those who are struggling with the job search may need to consider using different types of sources rather than additional sources, in general.

At the same time, there were no differences in number or type of sources used between those who obtained a job and those who were unemployed. Blau and Robins' (1990) finding that those who were employed received more offers per source used than those who were unemployed should be taken into consideration with these findings. Future research should investigate what, if any, diminishing returns are experienced with additional source use during the job search. At what point does adding more contact to one's job search network lead to reduced overall effectiveness of search?

On its face, this data challenges the SWT findings that the majority of jobs came from weak ties (Granovetter, 1973). At least as many jobs seem to come from online information and resources. Perhaps this is because strong ties and online sources are more effective bridges today than in the past with the always on Internet (Burt, 2005). Strong connections may be willing or able to connect job seekers with information found via additional online research. For example, imagine a job seeker's close friend is a particularly adept Internet user for whom search comes easily. The job seeker may reap the benefits of a bridging strong connection because of this friend's skill. In contrast, the reduced importance of weak social connections prompts researchers to question whether websites connecting a job seeker to others online represent a weak or strong tie, or something else entirely. Haythornthwaite (2002; 2005) suggests that

websites which connect us to previously unknown others allow for the activation of latent ties. Latent ties transform into, at least, weak ties once they are called upon. In this sense, Haythornthwaite's theory is confirmed if websites are used to call upon weak connections. Study 2, below, prompts job seekers to rate websites in terms of tie strength and explores its correlates.

In all, based on use by job seeker, close connections and acquaintances were conceptually similar, blurring the lines between strong and weak ties. As shown in the first factor of the correspondence analysis, personal acquaintances were more closely linked to close friends and family than to professional acquaintances. This is not surprising considering many of the connections used by participants in Granovetter's (1973) also used moderate ties. Perhaps Burt's (1992) argument that tie strength is a correlate of relationship, not a cause of interaction, explains this finding. It seems there is an arbitrary dichotomy between strong and weak ties. Tie strength may not have much meaning in the modern job search context when online/technological sources are considered; indeed, these social sources loaded together in the correspondence analysis and look very similar across all centrality measures. Distinguishing between strong and weak ties may be less important than distinguishing between formal, social, and online sources but this analysis is unable to explore this distinction further. It is also possible that these dimensions reveal a propensity for a type of search rather than a type of source. Perhaps some people see the job search as a social network task while others see it as an information search task.

Finally, the second research question asked about demographic differences in source utilization. The only significant relationships were between the use of formal

sources, age, and income. This result showed that older job seekers were more likely to turn to formal sources and those with greater income were less likely to use such sources. This may signal that formal sources (i.e., job events, employment agencies, and printed advertisements) are decreasing in popularity with younger job seekers. Perhaps this is because younger individuals are more familiar with Internet use than are older adults. Alternatively, information about the types of jobs younger people look for (e.g., entry level) may be disseminated differently than the jobs older American's seek.

In line with Kraut et al.'s (1998; 2002) findings, people initially did not use the Internet to connect with others. The same seems to be true for job searches (though adoption of the Internet during job search was quite rapid, see Table 1), but over time job seekers nearly ubiquitously adopted the Internet for job searches. In turn, and in parallel to Kraut et al.'s findings, the increased use of Internet-based sources has led to a decrease in overall face-to-face activity in information-seeking during the job search. The question then becomes, are there diminishing returns with using the Internet as its use increases? Websites are almost certainly a less novel source of job information than they were when fewer people were using this source. The value of a structural hole is directly related to the number of people who have access to it (Bruggeman, 2016). In the case of job information on the Internet, most in this sample are using information from the Internet. Thus, online resources may be less capable to provide novel information because of their ubiquitous use.

Study 1: Strengths and Limitations

The national random-digit dial sample provides a high level of generalizability for these findings. Such data would be difficult for a lone researcher to collect.. In all, a

typology of job search sources seems to be present in the information sources used by American job seekers. The findings and discussions are not meant to be prescriptive. In fact, the use of various sources seemed unrelated to employment status. Instead, this analysis had the goal of describing the interconnection of sources used by the modern job seeker. This rich network was described in-depth by this analysis.

Job seekers are using online information and resources and social media now more than ever and the importance of these sources are clear given the findings of this study. The modern job seeker seems to use either online sources with social sources or online sources with formal sources. Further, the use of weak ties (whether considered personal or professional acquaintances) was related to the use of close friends and family. These findings call into question the weak tie, strong tie dichotomy. It seems that Americans use all sorts of social connections together perhaps even moving contacts from weaker to stronger social connections as part of the process.

The most internally differentiated source of job information, but least used, seems to be formal sources. Still, more than half of Americans turn to these formal sources for job information. Certainly, job seekers, particularly older ones, see some value in printed advertisements, career events, and employment agencies. Overall, these formal sources were ranked least important (combined, only 10.6% of participants, n = 52, reported these sources were the most important). In line with traditional SWT theory, formal sources are less important than one might assume; the "most important" sources are both social and online sources. This may be because formal sources are less dynamic than a conversation with a strong or weak connection. They could also be ranked less important because formal sources require greater effort than the click of a

mouse or the dialing of a phone. Thus, the modest role of formal sources, in this study, reinforces the SWT hypothesis. Social connections and, now, online sources seem to be the most important sources of job information for the modern job seeker.

This study is not without limitations. Though this was robust and random dataset, the analysis detailed here is a secondary analysis. Therefore, the survey questions were not originally created for the study detailed here. Measuring tie by category likely conceals meaningful variation that might come from measuring tie strength directly (Marsden & Gorman, 2001). Further, online sources or those contacted via social networking sites could be strong, moderate, weak or even latent ties, but it is not possible to know that based on this data (Haythornthwaite, 2005). Future research would benefit from measuring tie strength as well as type of job source. While this study demonstrated that formal sources were less important than social ties, in support of the SWT hypotheses, the inability to distinguish between strong, moderate, and weak ties within the various online and informal sources, means that the study cannot address other aspects of SWT.

The non-converging ERGM may signal the need for more advanced statistical specification of the model. Jackson (2014) recommends controlling for subgraphs using Subgraph Generation Models (SUGMs) or Subgraph Exponential Random Graph Models (SERGMs). Given the tendencies of network actors to use certain types of sources together, additional model specification using emerging techniques (i.e., SUGM and SERGM) could provide additional insight into the nature of how job seekers use multiple sources together. Certainly subgraph driven approaches offer potential to

explain the variation present in formal sources (i.e., correspondence analysis factors 3 and 4).

Finally, this data only provides descriptive information about source utilization. There are no answers for how and why job seekers turn to the sources the way they do during the job search. In other words, these findings do not demonstrate benefits of using one type of source over another, nor do they explain job seeker motivations to use a particular source. Questions remain about why job seekers tend to use online sources. Perhaps these sources provide high quality information or are easy to access. Certainly the ubiquity of online information sources (including accessing social sources through SNSs) is changing the sources a job seeker utilizes. In addition, the low use of formal sources could be related to the inability of these sources to influence employers (relative to social sources) or some other source attributes. Further, perhaps job seeker attributes determine what sources are used during the job search. Fortunately, many of the issues left unanswered in this study are directly addressed in the second study (detailed in Chapter 4).

Study 1: Conclusion

This first study used a dataset collected by the Pew Internet and American Life Project to describe the affiliation network of American job seekers. Results revealed a pattern for job searches that segmented sources into social sources (i.e., personal and professional acquaintances, family, and friends), formal sources (i.e., employment agencies, printed advertisements, and career events), and online sources (i.e., online pages and social networking sites). These findings suggest that job seekers use source types that are similar. This research provides some support and some extensions to

SWT by emphasizing the importance of social connections during the job search. However, the findings also challenge SWT assumptions with equally compelling evidence for online resources and information and the use of social networking sites. Further, close personal relationships loaded together with personal and professional acquaintances in the correspondence analyses. This study highlights the need for future research on source attributes, job information seeking types, and calls into question the dichotomy of strong and weak ties. The chapter that follows addresses why job seekers choose the sources the way they do during job search.

Chapter 4

Motivation for Source Utilization During Job Search

Haythornthwaite (2005) contends that, “The key difference between a network approach and other kinds of evaluations is that it is the interaction between people that matters, rather than what the individuals think or do on their own” (p. 127). Though Haythornthwaite’s contention is correct with regard to social network approaches, her claim that network theorists do not focus on what people think or do highlights the major weakness in the structural approach to social networks. Often job search and social network theory either assumes that actors make rational choices based on their networks or that available structures supersede human agencies. There are two issues with the assumption of network-based rational choice: network awareness and rationality. Lazer and Friedman (2007) make the compelling argument that, “if agents could easily survey all possible solutions, identifying the best one would be trivial” (p. 669). Restated, network actors are not, generally, aware of the accurate composition of the networks in which they reside. Put another way, predicting one’s network composition is akin to being a meteorologist by looking out the window–a single actor can only see so far. The second issue with the network assumption is that job search and social network research assumes that actors will “take advantage of the network position in which they find themselves. However, research finds that they often do not” (Obukohva & Lan, 2013, p. 2215). Job seekers are either not easily able to see or willing to call on the resources each potential job information source can offer.

Whether it is because job seekers cannot or will not, they do not always (or even usually) utilize the network resources as predicted by network theory. There are many

contingencies that may determine how job seekers perceive their network and why they utilize the sources the way they do. No single theory provides a comprehensive list of potential reasons why network contacts, or any other job information sources for that matter, are utilized. As outlined in Chapter 2, the most common explanation for utilization of a source during the job search is strength of relationship. The prevailing hypothesis is that strong connections are willing to help or influence others in the job attainment process and that weak connections are useful both because they are numerous and are capable of providing unique information (Granovetter, 1983; Marin, 2013; Smith, 2012). However, Granovetter's (1973) definition of tie strength as a linear amalgam of interaction frequency, mutual reciprocity, emotional intensity, and intimacy has not been consistently demonstrated across research domains (Marsden & Campbell, 2012). Granovetter's definition represents the taken-for-granted assumption that has undergirded the SWT research, but there is little definitive evidence that each type of tie is associated with anything other than frequency of interaction and relationship closeness (Friedkin, 1990; Marsden & Campbell, 2012; Wickramasinghe & Weliwitgoda, 2011). Despite much theorizing about the role of ties, Burt (2005) reminds network scholars that "the value of a relationship is not defined inside the relationship; it is defined by the social context around the relationship" (p. 11).

The competing justifications forwarded by SWT, SHT, and social capital theories posit different explanations for job search behaviors (for a review, see Chapter 2). Study 2, detailed in this chapter, seeks to remedy some of the tension between these competing theories by addressing *why* actors choose to utilize the sources they use during the job search. The present study uses ego-based measures to construct ego-

networks of job seekers and questions the taken-for-granted assumptions of the benefits and drawbacks associated with various social ties.

Theory and evidence suggests the importance of human choice in networks may explain why alternative explanations pervade the literature on job search and network utilization. The various justifications for the benefits of tie strength are laid out in the first portion of this paper. Following this set of competing justifications, a task-based contingency theory of job search is presented based on the task contingency model (Hansen, 1999; Hansen, Podolny, & Pfeffer, 2001) and recent theorizing about uncertainty management (Brashers, 2001; Kramer, 1999; 2004). Throughout the review of literature, hypotheses and research questions are presented, and research methods are presented. The study concludes with findings and a discussion, including limitations and directions for future research.

The sections below first briefly explore the form and function of ties in the social landscape of the job search. This between source model focuses on the benefits (e.g., information, expertise, influence, status, helpfulness, accessibility, and support) of sources and the network compositions (i.e., liaison role and overall composition), which affect job search choices. Following this review of both benefits of ties and network composition, the next section introduces a within-job seeker contingency perspective and provides evidence from uncertainty management theory to suggest that individuals turn to different sources based on their perceived uncertainty discrepancy.

Between Source Motivations: Resources and Network Positions

Lin (1999) provided a valuable framework for understanding how social resources, like job information, are exchanged between actors. Specifically, Lin

classifies network theory into two categories: embedded resources and network locations. *Embedded resources* come from social resources of an ego's contacts (i.e., alters); these resources include information the alter has access to which the ego does not. For instance, an embedded resource is contact status. A job seeker may benefit from the status of a contact when that person is willing and able to exert influence the job seeker's attainment of a job. Lin (2001) contends that "embedded resources constrain and enable individual choice and action" (p. 247). For example, a job seeker may recognize that contacting someone who can influence hiring is helpful, but if the job seeker does not know anyone who can do so, they lack the embedded resources.

In contrast, *network locations* are endogenous to the ego (based on the network position of the ego) and include bridge access and strength of ties. Network location focuses on how close or far an actor is from a strategic location (e.g., how many connections away a job seeker is from the ideal position). For a job seeker, network location can be as simple as being connected to someone who knows someone. Network positions focus on the network structure, not on actors' attributes. Burt's (1992) SHT, bridging argument is based on network location (for a review, see Chapter 2). Clearly, embedded resources and network locations are not mutually exclusive; in fact, there is overlap between these two constructs. When it comes to social capital, the resources available to an individual flow both from the attributes of those whom the actor has access to (i.e., embedded resources) as well as their ability to connect the actor strategically across otherwise impassible social boundaries (i.e., network locations). A job seeker benefits from knowing someone who can influence, provide information, connect to others, or is in an advantageous position. It is the combination of both the

embedded resources and network locations, which provide benefits of the social network to a job seeker (Lin, 1999). There are many reasons why an ego might turn to an alter or, conversely, an alter might offer to help during the job hunt. Network researchers are obligated, then, to think not only about positions but also about the kinds of resources that alters can and do offer.

Social capital research generally concedes that theoretical assumptions are biased either toward embedded resources or toward network locations. For example, Burt (2004) admits a structural bias focused on the network composition (i.e., network location); in fact, Burt (1992) goes so far as to claim that, "the network is its own explanation of motive" (p. 36). In contrast, Lin (2001) embraces a relational bias highlighting the embedded resources, including trust, which are available from social contacts.

Burt (2005) emphasizes these competing benefits with the terms, brokerage (referring to network locations) and closure (referring embedded resources, like trust, that come from relationships). In contrast, Lin's (1999; 2001) research shows a preference for contact attributes (e.g., status, industry, gender, etc.) and deemphasizes the role of tie strength during job searches: "The weakest ties are clearly not useful (Bian, 1997; Bian & Ang, 1997), since ties with no strength offer no incentives for exchange" (Lin, 2001, p. 94). In contrast, Burt's (1992; 2005) research broadly favors weak ties for their ability to bridge structures (for a review, see Chapter 2). Most social capital research acknowledges that both network locations and embedded resources are important predictors of network effectiveness of a job search. However, network theory remains unable to rectify the tension between embedded resources and network

locations as explanations for action. Overall, when and if embedded resources are superior to network position or *vice versa* remains an unanswered question in the job search and SWT literatures.

Burt (1992) proposes that structural position is the determining factor of whether or not a social tie is helpful (i.e., structural holes theory; SHT). In contrast, Lin (1999) and Granovetter (1973; 1983; 1974[1995]) suggest that certain individual attributes like the ability to influence, provide information, reciprocate help, influence through status, and even the ability to provide support are the defining features that make job sources useful. No theory about the use of contacts is capable of addressing how a job seeker perceives each source. Further, the lack of evidence about perceptions of source attributes means that each theory fails to consistently predict source utilization by job seekers. If job seekers do not view weak ties as beneficial information sources, then those distant contacts are not utilized as information sources. In contrast, if a job seeker finds that weak ties provide sufficient social support online, that job seeker is not likely to activate strong ties during the job search. Finally, the costs (i.e., time, energy, and effort) associated with accessing both strong and weak ties are reduced with online social networks both informally (e.g., Facebook, Twitter) and formally (e.g., LinkedIn, Glassdoor.com, Monster.com; Kuhn & Mansour, 2014).

The first half of this study seeks to explore the correspondence between sources and various attributes. Specifically, this study explores the assumption that job seekers use sources according to attributes ascribed to the source. The second half of this study zooms out to focus on how within-actor contingencies (i.e., task-familiarity with job search and uncertainty discrepancies) affect the ties job seekers call on. Few researchers

have attempted to systematically clarify the differences between strong and weak ties (Friedkin, 1990) and their effects on job searches (Yakubovich, 2005). The following sections review past research findings and present hypotheses about benefits of different types of ties.

Operationalizing Tie Strength

Chapter 2 overviews Granovetter's (1973) definition of source attributes that contribute to tie strength; for review, "strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" (p. 1361). Few studies however, have attempted to integrate or measure all of these intuitive components of tie strength. The two most frequently used operationalizations have been relational closeness and interaction frequency (Marsden & Campbell, 2012). In fact, Granovetter's original study used only interaction frequency to classify ties. In sum, there is no universally agreed upon measure of tie strength. Hence, theorizing about network resources often uses terminology that describes structural position (e.g., bridges, Burt, 1992) or resource availability (e.g., status, Lin et al., 1981) instead of focusing on strength of a single interpersonal relationship.

What is clear, despite the many potential components of tie strength, is that it is not a simple dichotomous categorization of strong or weak. Tie strength is a continuum ranging from no relationship (latent or no tie) to very strong ties. Generally, both interaction frequency and closeness are considered suitable indicators (see Marsden & Campbell, 1984; 2012 for a discussion). Relationship title (e.g., friend, coworker, sibling, etc.) is not directly related to the benefits provided by a tie; that is, it is

inappropriate to claim that a sibling is always a strong tie or a coworker is always a weak tie. Measures of tie strength have deviated significantly from Granovetter's intuitive definition and recent scholarship favors terminology of closeness (Rozzell et al., 2014), bandwidth (Aral & Van Alstyne, 2011), and other more specific language. However, in line with the plurality of SWT research (see Marsden & Campbell, 1984; 2012), this study uses the combination of interaction frequency and closeness to classify sources on a continuum ranging from weak to strong ties. Additional perceived attributes of job search resources, which may or may not be included in the meaning of tie strength, are explored below.

Tie strength correlates. Given the extensive literature on SWT, an aside of stable correlates of tie strength is necessary. In addition to closeness and frequency of interaction, there are a number of correlates of ties strength that have been consistently found across studies. Because these correlates are well worn, they are excluded from the extensive set of hypotheses outlined below. Specifically, research consistently finds that closeness and trust are highly related (Burt, 2005; Coleman, 1988). Further, reciprocity is a well-demonstrated correlate of both closeness and frequency of interaction (Burt, 2005; Coleman, 1988).

Still, there are several other correlates of tie strength that are less certain and mark the crux of the debate about when and whether tie strength matters during job search. For instance, informational benefits are not exclusive to weak ties (Burt, 1992; Marsden & Gorman, 2001). Additionally, weak ties are not the only connections capable of serving as bridges (see discussion of forbidden triad, Chapter 2). Thus, the

following sections detail tie strength benefits that are less understood, to decipher how job seekers view their social networks.

Information benefits. As detailed in Chapter 2, SWT posits that informational benefits are the primary advantage that weak ties provide in terms of job information (Burt, 1992, 2005; Granovetter, 1973, 1974 [1995], 1983). In fact, the competition between information and influence are theorized to explain the difference between utilization of weak and strong ties. In probabilistic terms, the theoretical justification for weak ties having more and better information, because they are more numerous and have access to more diverse group of people, makes sense (Burt, 1992; 1999). However, job seekers' utilization of ties because of their ability to provide information remains empirically ambiguous. Research shows mixed results about the use of weak (relative to strong) ties during the job search process (Lin et al., 2014). The tension is between the probabilistic reality that weak ties have access to additional and more diverse information than strong ties, and the practical reality that job seekers seem to use ties indiscriminately, deserves additional attention.

The theory is clear: Job seekers have access to better information through weak ties (Granovetter, 1974). Indeed, "in a world where information is costless," both employers and employees could find the highest quality information and utilize it for making hiring/application decisions (Fountain, 2005, p. 1237-1238). Unfortunately, as detailed in Chapter 2, information is not costless; job seekers do not always know which source has the highest quality information, and job seekers must consider both costs and benefits of calling on any particular source (Smith, 2012). Luckily, complex communication systems like Facebook, Twitter, and LinkedIn give users more access to

weak ties (and their valuable information; Granovetter, 1983; Haythornthwaite, 2002). Thus, the ability of weak ties to convey quality information may increase with the use of technology during the job search. Technology shortens the distance between a job seeker and job information (Fountain, 2005; Haythornthwaite, 2005). For example, Rozzell et al. (2014) contend that the costs of maintaining weak ties is reduced by the modern social web. Because it is both easier and cheaper to maintain weak ties, the information benefits of weak ties are more easily accessible online.

Both Utz (2016) and Nikolaou (2014) provide evidence that use of media leads to greater perceptions of usefulness of information obtained during the job search. In line with the original theory, when job seekers perceive that information is available from a source, it is likely they seek that information (Fountain, 2005; Granovetter, 1974). If SWT and SHT premises hold true, the disproportionate added availability of weak ties online (boyd & Ellison, 2007; Gee et al., 2017) should give rise to easy access to high quality information. Therefore, it hypothesized that weak ties provide information perceived to be higher quality than the information provided by strong ties. Therefore, the following hypothesis:

H1. For job seekers, perceived quality of job information is negatively associated with perceived strength of tie.

Expertise. Having information is not necessarily the same as possessing expertise. Contractor, Monge, and Leonardi (2013) use transactive memory theory to propose that expertise serves as a valuable resource in determining which sources are used in a network. According to transactive memory theory, individuals are more likely to seek information from a source with more perceived expertise (Wegner, 1995). Thus,

network connections that are rated as more expert will be utilized more often during job searches.

The expertise of strong and weak ties remains largely unexplored. Participatory websites, such as Glassdoor.com, are perpetually accessible to Internet users and provide instant contact with a vast repository of weak ties (e.g., Gossett & Kilker, 2006). In addition, research has shown that information from a node with technical expertise will be favored over a node with less expertise, even if the network is composed of both humans and technological actors (Contractor et al., 2011; Yuan, Fulk, Monge, & Contractor, 2010).

Su and Contractor (2011) ingeniously tested the information seeking from both human and nonhuman sources. Results from their study showed that human sources were used when the sources were perceived to have expertise, and technological sources were used when a source was expected to have a large amount of knowledge. However, Su and Contractor's (2011) work focused on information seeking by consultants. In the context of job searches, the relationship between both human and technological and strong and weak ties with expertise remains unknown. Perhaps, online sources, like individuals, serve as knowledge hubs or network stars. Alternatively, online sources may be seen as inexpert. Given the ability of previously unknown others (i.e., latent ties) to provide detailed information about an organization through reviews (e.g., glassdoor.com, radioshacksucks.com), the following research question is presented:

RQ1. For job seekers, how does perceived expertise of job information sources relate to perceived strength of tie?

Influence. Granovetter (1974, 1983) hypothesizes that strong ties are useful

because of their willingness to exert influence. Two studies provide evidence that influence may be an important function of strong ties. In support, Bian and Huang (2015) demonstrate that among Chinese job seekers, the use of *guanxi* or influence by job seekers' social ties has both increased over time and become more reliant on strong ties between 1978 and 1999. Studying a Russian community, Yakubovich's (2005) speculated: "When a tie leads to an intermediary whose main resource is the ability to provide referrals, motivations become crucial and stronger ties are better at ensuring it" (p. 418; more information about the role of intermediaries or liaisons is detailed below).

On the other hand, much research also suggests that weak ties can also be influential for job seekers. As detailed above and in Chapter 2, qualitative evidence from Marin (2012) and Smith (2012) suggests that weak ties are more likely to exert influence than are strong ties. Weak ties are willing to exert influence because sticking one's neck out for a stranger does not incur the same social costs as vouching for a close friend or family member. Given the mixed findings regarding influence of tie strength during the job search process, a second research question is posed:

> **RQ2.** For job seekers, how does perceived influence of job information sources relate to perceived strength of tie?

Contact status. Lin et al. (1981) sought to test strength of weak ties by looking at status attainment as a result of social ties. Results have been consistent across time; status of tie is a direct predictor of increased status in job attainment (Lin et al., 2014). Lin et al. (2014) clarify that the "use of contacts does not show any advantage in job attainment" (p. 21) but the use of higher status contacts leads to better job attainment. Additionally, weak ties are more likely to be of higher status than strong ties. Thus, it is

not just what contacts a person has, but the status of contacts determines the usefulness of networks (Van Hoye et al., 2009). That is, weak ties with higher status than the job seeker provide access to better job information than equal status strong ties.

As in Granovetter's (1983) review, social class seems to play an important role in the willingness to put one's name on the line for a known (strong or weak) social connection. Specifically, in studying "custodians, food service workers, and administrative staff," Smith (2012) concludes that better-known strong ties were recommended to a position less frequently than weak ties that were perceived to have lower risks of failure. As a complement, Marin's (2012) research on white-collar workers (of presumably higher social status) showed a preference (proportionally, at least) in recommending jobs to weak ties. Thus, the following hypothesis is proposed:

H2. For job seekers, perceived source status is inversely related to perceived strength of tie.

Accessibility of source. According to SWT, one of the benefits of strong ties is that they are obliged to help because of existing relationships (Granovetter, 1983; Marin, 2012; 2015; Smith, 2012). Strong ties, by definition, make themselves available to access; still, that does not mean they are always willing to assist because of the costs associated with helping. However, weak ties are also often easy to access, because of reduced social costs of contacting them (Lin, 2001), but that may not translate to a willingness to assist (Marin, 2012; Smith, 2012). Both strong and weak ties are easily accessible. Weak ties are accessible because the low cost of contacting others online (Haythornthwaite) and limited consequences associated with sharing privy information with strangers (Marin, 2012; Smith, 2012). Complimentarily, strong ties are accessible

because of the low cost associated with asking a close partner to help (Granovetter, 1983). Based on the complex costs associated with access of both strong and weak ties, a relationship between tie strength and accessibility is proposed:

> **H3.** Among job seekers, perceived tie strength has a curvilinear relationship with access to job information sources such that both strong and weak ties are more accessible than moderate ties.

Social support. Granovetter's study represented a major breakthrough in a world where weak ties were typically regarded as not valuable to networks (Burt, 1992). After all, strong ties provide major resources, they represent others who can loan us money in a time of need, or can be called upon at a moment's notice. Research has traditionally shown that distal others are not sources of support (Burleson et al., 2011). But recent research by others and myself has suggested that online, both weak and strong ties are equally able to provide social support and SNSs allow us to maintain far more weak ties (Carr et al., 2016; Rozzell et al., 2014). Further, research on social media use and unemployment suggests that job seekers gain support from their social connections online (Fieseler et al., 2014). Further, using unobtrusive data scraped from Facebook's servers, Burke and Kraut (2013) found that Facebook interaction with more strong ties led to faster job attainment and strong ties provided greater levels of social support. Specifically, Burke and Kraut also found that while strong ties were able to provide social support on Facebook, weak ties did not affect support. In light of competing findings about tie strength and provisioned support, Carr, Wohn, and Hayes (2016) conclude, "social media facilitate the receipt of abundant social support, as relationally close and nonclose ties alike provide public and private messages to

individuals that are perceived as supportive" (p. 386).

In the job search context, Yakubovich (2005) concludes, following a longitudinal analysis of tie use in Russia, that strong ties can bear burdens that weak ties are either unable or unwilling to carry for a job seeker. Recent research indicates that social support is exceptionally helpful during the job search. Fieseler et al. (2014) find that online contacts provide support for the unemployed and that increased support leads to exhibition of more active job search behavior. When coupled with Burke and Kraut's (2013) finding that increased contact with strong ties leads to both increased perceptions of support and decreased unemployment duration, these findings suggest that benefits conveyed by strong ties, like emotional support, are helpful in the job search process. The social support process is complex, and more research is needed. However, the plurality of evidence suggests the following two hypotheses:

H4. For job seekers, perceptions of social support from job information sources are positively related with perceived strength of tie.

H5. For job seekers, perception of received social support is related with their reduced unemployment duration.

Network Motivations

Now that the potential benefits of job sources (i.e., embedded resources) have been outlined, Lin's (1999) second category of benefits based on structural position can be explored. Burt (1992; 2005) and Granovetter (1973; 1974[1995]) both base their justifications for the benefits of weak ties on the structural positions of social connections (for a review, see Chapter 2). The following paragraphs outline two potential network benefits: size of the job seeker's network and structural position of

the job information source. Like the previous section, this section focuses on the perceived, rather than the actual, network to highlight the connection between perception and utilization of social networks.

Network size and unemployment duration. Because of the cumulative value (whether from information, influence, support, or connectedness) that comes from maintaining contacts, it is likely that job seekers who use contacts are already in an advantageous position relative to those who do not use contacts for job searches. That is, job seekers who use contacts need to use fewer sources of information because of the quality of information to which they already have access. As Marsden and Gorman (2001) explain, though lumping contacts use into an undifferentiated category conceals meaningful variance, research consistently shows that those who use social ties are at an advantage.

Adverse selection in labor markets refers to the information asymmetry that benefits those who are already successfully employed. Those who are employed have access to more valuable employment information, because of their networks, than those who are currently unemployed (Montgomery, 1991). Adverse selection assumes a rich-get-richer perspective whereby those who are known to be qualified are more likely to receive information and thus require less energy when seeking a job. Greenwald (1986) proposes that the labor pool is composed of workers who are, on average, less qualified than those who are currently employed.

In network terms, this is called the Matthew Effect (Merton, 1968), as Kadushin (2014) explains: "'To those who hath shall be given,'" a scriptural truth hallowed in science, in deference to the Gospel" (p. 69). Further, as detailed in Study 1, the findings

from Addison and Portugal (2002), Blau and Robins (1990), and evidence from Van Hoye et al. (2009) show that as the use of network resources by job seekers increased, the number of offers increased (though the number of jobs obtained did not). Therefore, being well connected, or adverse selection, is a very useful resource for job seekers. Though adverse selection has not been attributed to differences in the number of sources used by job seekers, it can explain why those who find jobs use fewer sources than those who remain unemployed. Therefore, it is hypothesized that:

> **H6.** Job seekers' perceived network size is negatively associated with their unemployment duration.

Liaison contacts. Burt (1992) highlights how weak ties are not the direct source of connection information (like jobs). Instead, the source of information is the bridge provided by some weak ties. When weak ties are replaceable (or interchangeable), they may represent *secondary structural holes.* Secondary structural holes are connections that are at a length of greater than one degree and connect to previously inaccessible networks. That is, an ego's tie's (i.e., alter's) connection to a new network structure. Secondary structural holes are easily accessed through participatory websites. An ego relies on websites that connect users to serve the role of liaison. As detailed in Chapter 2, *liaisons* are, in the context of this study, weak ties that provide access to organizational knowledge that was previously inaccessible (Granovetter, 1973).

Liaisons connect the ego to social cliques of which the liaison is a member, but the ego is not. Therefore, liaisons are the nodes that access the resources found in the secondary structural hole. Websites like glassdoor.com and indeed.com serve as a liaison between the ego and a second-degree, human tie. If a person leaves a review

about culture, pay, politics, or other organizational details on a webpage and the ego later accesses that website, the website serves as a liaison between the reviewer and the ego. In this case, the reviewing user provides access to the secondary structural hole by describing their work environment, rating work experiences, or detailing other important job information. The reviewer is a secondary structural hole because the information source, to which egos are not directly connected, is only available through the node/participant of the website.

Of course, human actors (i.e., both strong and weak ties) can also serve as liaisons to cross structural holes. In the appendix of his 1974 book, Granovetter acknowledges how jobs were often found through a culmination of sources that led to jobs and at times, it was contacts from a distance that helped. For instance, from the 61 face-to-face interviews, Granovetter found that 39.1% used chain lengths of zero, 45.4% lengths of one, 12.5% lengths of two, and only 3.1% used resources at three connections away. If these patterns hold true for the modern job seeker, it is likely that this length of connection is an important, but thus far ignored, correlate of successful job attainment resources. Fountain (2005) explains that the best evidence suggests that direct application to a job is not as efficient as "when searchers and employers find information about one another through a chain of acquaintances" (p. 1254). Fountain conjectures that if the hypothesis that weak ties provide a greater quality and quantity of information is correct, it is also likely that the Internet can facilitate these relationships between employers and job seekers.

Most authors examining the strength of weak ties have routinely treated weak ties as liaisons (Burt, 1992). As Chapter 2 points out, weak ties are not inherently

useful; instead a weak tie that bridges to connections in otherwise inaccessible networks (i.e., structural holes) is useful. Statistically, these bridges are almost always weak ties (that is, forbidden triads, or relationships in which two strong ties of an ego are not directly connected to each other, seem to be quite uncommon; Burt, 2000; Kalish & Robins, 2006). The exigency of the modern job search is, while SWT focuses on the strength of access or quality of information, the Internet is making weak ties more accessible (Haythornthwaite, 2005). Further the social web is making unknown secondary ties accessible through social aggregations of data and their particular network structure (Doh & Hwang, 2009; Lim & Van Der Heide, 2015; Walther & Jang, 2012).

In all, there is reason to suspect that liaisons may be relatively important in the processes of finding a job. The original conceptualization used by Granovetter only focuses on human-to-human relationships. Even so, Granovetter fails to classify relationships that use true liaisons. For instance, one case that Granovetter classified as "direct application" reads as follows:

> Case #28: Issac E. applied to a large, new electronics firm which everyone in the field knew was opening a branch in the Boston area. He had a friend working in another branch of the company who knew of his application. While visiting the Boston branch, the friend told a friend of *his*, in a high position, that Mr. E was well-qualified and should be sought out. This friend of Mr. E.'s friend retrieved the application from the personnel office and became his employer (Granovetter, 1995, p. 197, emphasis in original).

In Granovetter's analysis, this case was coded as direct application. Still, as Granovetter notes, it is clear that personal contacts played an important liaison role in Mr. E's receiving a job. While social websites cannot actively advocate and influence organizations, there is no doubt that they can serve a valuable role in the information

network. Fountain (2005) hypothesizes that if SWT happens online, it may be because "the Internet is indeed a labor market intermediary, but not in the conventional sense" (p. 1255). To the point, liaison ties should bridge out and serve as powerful bridges across structural holes. Liaisons more often served as the best lead for jobs among those in Tianjin, China (Bian, 1997). As Ramirez, Walther, Burgoon, and Sunnafrank (2002) explain, computer mediated "contexts shift the information source from social networks to the sociotechnical electronic network" (p. 221). Websites represent sources of information, but with increasing focus on user-generated content in participatory websites, egos can also easily access latent ties (e.g., job reviewers) through these "more and shorter paths" between the ego and the target (i.e., liaisons via the Internet; Granovetter, 1973, p. 1365). Actors do not perceive whole networks; network actors see, at best, around two steps away (Bruggeman, 2016). Because perception affects network utilization, actors' perception of a tie's ability to connect them to otherwise inaccessible others is hypothesized as the following:

> **H7.** Job seekers perceive that the most connected paths between them and job information are online resources.

Within Job Seeker Motivations: A Contingency Perspective of Job Search

The research findings laid out in the sections above paint a varied picture of the reasons individual job seekers turn to each resource. At a minimum, it is clear that each type of tie (from weak to strong and in-between) is capable of providing various types of assistance; at the extreme, some sources may be storehouses for many kinds of assistance. The question thus becomes: why do job seekers turn to the ties they choose to turn to? The first answer is obvious: network perception determines much of network

utilization. Additional answers can be derived from theory: both the familiarity with the task of finding a job and perceptions of uncertainty about job search may affect whom the job seeker turns to for assistance.

The aggregate of benefits available through a combination of sources likely affect network use, not just the ability of one particular source to do one particular thing. As Fountain (2005) concludes, "the proper focus of analysis is the *social network as a resource*, rather than a specified path a piece of job information flowed through" (p. 1239). Restated, a job seeker does not just turn to a strong tie because that person can provide support; instead, a job seeker turns to those who are helpful as well as those who can provide support while seeking sources that have the most expertise and information. Job seekers turn to strong, weak, and moderate ties to seek the resources necessary to obtain jobs. Turning the focus from tie attributes to job seeker perceptions, the following section presents a within-person contingency perspective of job search.

The cumulative effectiveness of a pool of network resources (rather than just one type or kind of tie) is likely the source of job attainment. Just because an ego can access a given resource via the network, there is no guarantee that the alters with the resource will be called upon (Lin 1999; 2001). Perceptions of social space dictate how job seekers utilize sources differentially. As Granovetter (1985) contends, "actors do not behave or decide as atoms outside a social context, nor do they adhere slavishly to a script written for them by the particular intersection of social categories that they happen to occupy" (p. 487). Therefore, there is no linear combination of benefits and drawbacks from each job information source that can predict source utilization. Instead, job seekers to consider contingencies they face during the job search to determine what

resources they will use. The following section introduces two contingencies that may determine what sources are called upon during the job search: the task-familiarity contingency and uncertainty discrepancy contingency.

Task-Familiarity Contingency

Hansen et al. (2001) usefully employ the term *contingency* with regard to social network utilization. Building on March (1991) and others, several authors have used task-familiarity categorizations of exploitation versus exploration to balance the competing benefits of strong versus weak social connections. Rice and Leonardi (2014) praise the distinction between exploratory and exploitative learning as a means to explain how network members find new knowledge and apply known information respectively. In short, the relationship between exploration and exploitation is measure of task-understanding or task-familiarity on the part of the information seeker.

March (1991) defines *exploration* processes as synonymous with "search, variation, risk taking, experimentation, play, flexibility, discovery, [and] innovation" (p. 71). In all, exploration tasks are tasks that are relatively unknown to the ego. Adding to these definitions, Lazer and Friedman (2007) include that exploration includes attempts to introduce new information and the development of novel solutions. Therefore, the information needed to complete a task viewed as exploratory is "likely to be tacit, that is, it is difficult to articulate or can only be acquired through experience" (Hansen et al., 2001, p. 8). Because exploratory tasks are novel and required nuanced understanding, Hansen et al. (2001), Hansen (1999), and Lazer and Friedman (2007) all predict that exploratory tasks rely more heavily on strong (or embedded) social relations.

In contrast, *exploitation* is synonymous with, "refinement, choice, production, efficiency, selection, implementation, [and] execution" (March, 1991, p. 71). Thus, exploitation is a task for which the focal actor already has a good understanding of how to complete the task and only needs additional insight, which can usually be explicitly articulated. Hansen (1999) found that weak ties facilitate information search but hinder the process of complex knowledge transfer. This conundrum, whereby strong ties are efficient at transferring complex knowledge while weak ties excel at searching for novel solutions was labeled *the search-transfer problem* by Hansen. The search-transfer process has since guided much of the research on exploitation and exploration in social networks. Recent research using this distinction generally finds that individuals benefit from strong ties for the transfer of complex and unknown information (i.e., exploration) and rely on weak ties for the transfer of explicit and more familiar information (i.e., exploitation). These findings suggest that uncertainty about the job search task on the part of the ego may be an influential force in the process of finding a job.

The job seeker (ego's) conceptualization of the task dictates what resources he or she is willing to call on during the job search. For instance, Uzzi and Lancaster (2003) report that the sources of information vary based on the task at hand and "these forms complement each other in the organizational learning process" (p. 390). Most research on exploration and exploitation considers these two constructs as unidimensional—that is, the scale for exploitation is used and low scores of the same scale are assumed to indicate exploration (see the measures section of Hansen et al., 2001). However, there is not a one-to-one relationship between exploitative and exploration network behaviors and strong and weak ties. March's (1991) framework

indicates that exploitation and exploration are two distinct, rather than one dimensional, forms of learning. Keeping in mind the importance of perceived network resources available, hypotheses about the effects of both exploitation and exploration can be posited with regard to tie usage and job search:

H8. Controlling for perceived network size, the extent of exploratory nature of a job search is positively associated with the average strength of ties used.

H9. Controlling for perceived network size, the extent of exploitative nature of a job search is negatively associated with the average strength of ties used.

Uncertainty Contingency

Searching for a job can be an anxiety-laden process due to ambiguity about job prospects. Alternatively, searching for a job can be a passive activity one does to pass the time (e.g., checking professional associations' listserv daily or receiving a call from a colleague in a nearby state). Job searches are not uniformly uncertain. Uncertainty management theory (Kramer, 2004) can help to explain why job seekers turn to particular sources during the job search. The level of uncertainty experienced by job seekers may serve as a better proxy than tie strength alone for explaining *why* job seekers choose to turn to the sources the way they do. Incorporating uncertainty into the SWT framework addresses the motivation for using particular ties during the job search.

There are numerous definitions of uncertainty and several modern reviews that define and redefine uncertainty (e.g., Knobloch, 2008). Brashers (2001) proposes that the original conception of uncertainty reduction be avoided in favor of a more comprehensive definition of uncertainty as existing "when details of the situation are ambiguous, complex, unpredictable, or probabilistic; when information is unavailable or

inconsistent; and when people feel insecure in their own state of knowledge or the state of knowledge in general" (p. 478). Kramer (1999; 2004) borrows Baxter and Montgomery's (1996) definition that uncertainty is the degree to which situations are not adequately understood or are unpredictable.

There are many reasons why a job seeker might be uncertain. They may be uncertain about the general process of job search, about the specific organization they wish to enter, or about the prospect of changing roles or positions. Uncertainty could stem from personality or could come from situational exigencies. Regardless of where uncertainty originates for job seekers, it produces a potential motivation for action. Many times, job seekers look for information in order to reduce uncertainty. Kramer (2004) points out that communicators have multiple and often conflicting goals when seeking information. During a job search, one major goal is attaining a job, but other goals include feeling support while avoiding incurring high social debts. These competing motives extend beyond the source benefits detailed in this study. Instead, it is important to know that uncertainty does not lead to a uniform response from every individual. Contingencies of the costs, benefits, and risks weigh in the equation.

Feelings of uncertainty may affect individuals quite differently. If a job seeker feels uncertain but lacks control of a situation, the uncertainty may be cognitively avoided (for a detailed description of cognitive management, see Kramer, 2004, Chapter 4). Afifi and Weiner (2004) propose that uncertainty needs to be managed only when individuals experience a mismatch between their desired level of uncertainty and the actual level of uncertainty. The perceived discrepancy between actual uncertainty and desired level of uncertainty has been posited to better predict information seeking than

uncertainty alone. The perception of the potential gains and losses, rather than actual organizational opportunities, motivates newcomers to manage uncertainty (Lester, 1987). Perception matters more than reality when it comes to uncertainty management (Kramer, 2004). As Afifi and Weiner (2004) add, "the information-management process begins with individual becoming aware of an important issue for which they desire *more* or *less* uncertainty than they have, not that it necessarily begins when uncertainty is high" (p. 174, emphasis in original). That is, the level of anxiety an individual perceives (due to the discrepancy) prompts action, not necessarily the feeling of uncertainty. A job seeker can be very uncertain about how to find a job, but may not experience any dissonance about the process because he or she is comfortable with the uncertainty.

Despite the numerous techniques that aid individuals to manage discrepancies in uncertainty, research has generally shown that, "certainty leads to low motivation to communicate" (Kramer, 1999, p. 313). That is, the more certain an individual is about the job search process, the less likely the person is to need tacit knowledge explanation. Further, because of the complexities of tacit knowledge transfer, it is likely that individuals who experience high uncertainty discrepancy turn to strong ties for information (Hansen et al., 2001). Therefore, the next section details how uncertainty discrepancy interacts with the task-familiarity contingency in predicting which sources job seekers utilize.

Interaction of Uncertainty Discrepancy and Task-Familiarity

The task-familiarity framework is closely related to uncertainty because each position (exploitation and exploration) describes how and what type of information is

transferred. As Hansen (1999) explains, exploitation involves little task uncertainty. Instead exploitation focuses on explicit knowledge available by searching network resources. In contrast, the exploration is marked by high levels of task uncertainty and a need for tacit knowledge about how to do something (i.e., search for a job). March (1991) explains that when comparing the benefits of exploratory and exploitative techniques, "returns from exploration are systematically less certain, more remote in time, and organizationally more distant from the locus of action and adaption" (p. 73). When an information seeker is uncertain, it is likely that those known and trusted more are sources of information to help manage uncertainty. This contention is clear: when uncertain, individuals are not likely to turn to exploitative techniques. Instead, job seekers who lack certainty likely manage that uncertainty by turning to exploratory techniques.

Finally, as Brashers (2001) explains:

> Variability in types and sources of information is also important in uncertainty management. Individuals may choose some sources of information over others because there are differences in the efficacy of the sources or because some sources are more readily available and familiar than others. (p. 483)

In essence, Brashers (2001) is explaining difference in strong and weak ties in terms of information, influence, and homophily. Further, Brashers later claims that supportive others are more capable of assisting with the management of uncertainty in terms of both "ventilation and instrumental support" (p. 485). In sum, the strength of ties predicts use of those ties/relationships in managing uncertainty (detailed above). Adding in uncertainty discrepancy helps make sense of the contingency perspective of the job search process—when job seekers feel that they understand the job search well,

they likely use exploitative techniques (i.e. turn to their broad network or weaker ties to make it work for their benefit). In contrast, when job seekers are uncertain about the job search process, they likely turn to exploratory techniques or stronger ties in order to make the network work for them. As Brashers (2001) explains, when individuals are faced with uncertainty discrepancy, they "sublimate one goal for another" (p. 485). Because uncertainty discrepancy both determines a job seeker's choice of ties and interacts with task-familiarity (see Figure 5), it is hypothesized that:

H10. Controlling for network size, uncertainty discrepancy is related with higher average ties strength during the job search.

H11. Controlling for network size, uncertainty discrepancy is (a) positively related to exploratory ratings of the job search process and (b) negatively related to exploitative ratings of the job search processes.

H12. Controlling for network size, uncertainty discrepancy partially moderates the relationship between task-familiarity and use of ties such that uncertainty discrepancy leads to increased average tie strength.

Figure 5

Contingency Model of Job Search and Average Tie Strength

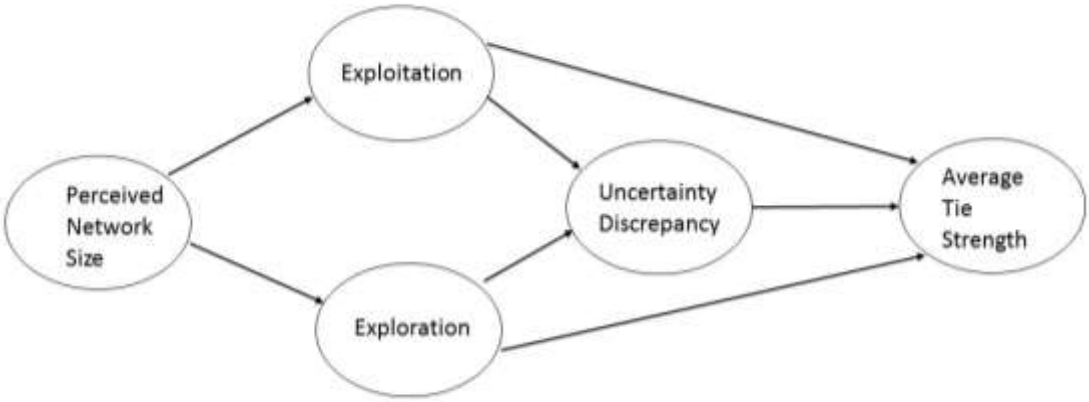


Table 5

Hypotheses and Research Questions for Study 2

Hypotheses and Research Questions
Between Source Motivations
H1. For job seekers, perceived quality of job information is negatively associated with perceived strength of tie.
RQ1. For job seekers, how does perceived expertise of job information sources relate to perceived strength of tie?
RQ2. For job seekers, how does perceived influence of job information sources relate to perceived strength of tie?
H2. For job seekers, perceived source status is inversely related to perceived strength of tie.
H3. Among job seekers, tie strength has a curvilinear relationship with access to job information sources such that both strong and weak ties are more accessible than moderate ties.
H4. For job seekers, perceptions of social support from job information sources are positively related with perceived strength of tie.
H5. For job seekers, perception of received social support is negatively related with their unemployment duration.
Network Motivations
H6. Job seekers' perceived network size is negatively associated with their unemployment duration.
H7. Job seekers perceive that the most connected paths between them and job information are online resources.
Within Job Seeker Motivations
H8. Controlling for perceived network size, the extent of exploratory nature of a job search is positively associated with the average strength of ties used.
H9. Controlling for perceived network size, the extent of exploitative nature of a job search is negatively associated with the average strength of ties used.
H10. Controlling for network size, uncertainty discrepancy is related with higher average ties strength during the job search.
H11. Controlling for network size, uncertainty discrepancy is (a) positively related to exploratory job search processes and (b) negatively related to exploitative job search processes.
H12. Controlling for network size, uncertainty discrepancy partially moderates the relationship between task-familiarity and use of ties such that uncertainty discrepancy leads to increased average tie strength.

Study 2: Method

Study 2: Sample

In parallel with the first study, participants were recruited from a national sample. Specifically, MTurk workers who were currently unemployed or had changed jobs in the past two years were invited to take this survey. Compared to a convenience sample of undergraduate students or a pool of participants from a single organization or industry, MTurk has a subject pool more varied in terms of both age and work-experience. The quality of MTurk responses has been compared to other methods of data collection and results show little, if any, variation (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis, 2010).

In general, the benefits of access, diversity of sample, and low cost for recruitment have been deemed acceptably high given the potential drawbacks of using this non-random sample (Mason & Suri, 2012). MTurk workers respond to Human Intelligence Tasks (HITs) in exchange for payment. Amazon® takes 20% of the HIT fee and the rest is passed along to the person taking the survey. For an additional 5% fee, a Master qualification, whereby workers' previously completed HITs are analyzed by Amazon® and deemed of high quality, can be requested. Because the survey used for this research is quite extensive (45-60 minutes), the HIT rate (i.e. amount of money each participant received) was set at $5.00 through comparison to similar tasks and after a discussion with the committee. This sample is also appropriate because it can extend the findings of Study 1 using a national sample.

GPower ®, a statistical package for determining sample power, was used to determine the sample size. A sample of 262 is sufficient for the regression analyses

proposed here given a small effect size of .10 (Faul, Erdfelder, Buchner, & Lang, 2009). This number is also appropriate for the structural model which, because of mediation, requires several hundred participants, especially if any issues arise with factor loadings for the scales used (Wolf, Harrington, Clark, & Miller, 2013). Though the measures were selected carefully, a conservative sample of 285 participants was included in the final analysis ensuring sufficient power. Details about participants and analyses are detailed below.

Participant demographics. Participants were 285 workers from Amazon's Mechanical Turk (MTurk). Participants ranged in age from 19 to 62 years old (M = 35.86, SD = 9.03, *Med.* = 34). Slightly over half (52.3%) of participants (n = 149) were male and 47.7% were female (n = 136). One participant had less than a high-school degree, 28 (9.8%) reported being high-school graduates, 74 (26.0%) had some college but no degree, 157 (55.0%) reported having an Associate's or Bachelor's degree, and 25 (8.8%) reported a Master's, Doctoral, or professional degree. The majority of participants were Caucasian (n = 246, 86.3%), 23 (8.1%) were Black or African American, 18 (6.3%) were Asian, 8 (2.8%) were American Indian, Alaskan Native, Native Hawaiian, or Pacific Islander, and three participants filled in three other answers ("Hispanic," "I don't believe in race," and "Latino").

Most participants had never married (n = 139, 48.8%), 37.2% were married (n = 106), and 14.1% were divorced (n = 37), widowed (n = 1), or separated (n = 2). One-hundred twenty-eight participants (44.9%) reported a household income of less than $40,000 per year, 76 (26.9%) reported between $40,000 and $70,000 per year, 79 (27.7%) reported earning more than $70,000 per year, and two participants (0.7%)

chose not to answer. Participants came from 42 different U.S. states, with 32 (11.2%) from California and 19 (6.7%) each from Florida and Michigan. Many participants (197, 69.1%) were definitely or probably looking for a job at the time of the study, 42 (14.7%) reported they might or might not be looking, and 46 (16.1%) reported they were probably or definitely not looking for a job. All participants reported having regular access to the Internet. The following sections detail the measures and data analysis procedures.

Study 2: Measures

There have been few empirical examinations of the assumptions of information flow through networked relationships (for an exception see, Aral & Van Alstyne, 2011). However, the present study seeks to empirically examine the benefits of various kinds of job sources including social ties and technological sources. Because this survey focuses on benefits across many sources, shorter versions of measures were utilized whenever possible. Each participant was asked to respond to the characteristics of job information sources they used during their current or most recent job search. The list compiled here reflects an amalgam of two camps of job search research: Current Population Survey (CPS) based studies and SWT studies (for a review, see Chapter 2).

Job search sources and social sources. Ten sources were strategically chosen to accomplish two goals: (1) represent the sources individuals are known to use during the job search and (2) capture relationships of various tie strengths. To derive this list, the scale used by the Current Population Survey (CPS, for a review, see Chapter 2) and the list generated by Smith (2016; the data used in Study 1), were adopted to create a list of 10 potential sources of job information which fit two categories: (1) social

contacts (i.e., close relational partners contacted in-person, acquaintances or professional contacts in-person, close relational partners contacted online, acquaintances or professional contacts online, job websites [e.g., Monster.com, Glassdoor.com]) and (2) formal sources (i.e., company websites, in-person application, employment agencies, print ads, and job fairs). Participants were also allowed to select "other" if one of the sources they used was not included.

For all 10 sources, participants were first asked, during your most recent/current job search, how often, if at all, did you use each source (1 = did not use, 2 = used occasionally, 3 = used frequently). Participants were also asked to name the tie (e.g., "Please write the first name or title (e.g., Jane, sister) of someone you are really close with (e.g., best friend, spouse, parent, child, etc.) who you contacted in person for job information"). This prompt accomplishes two things at once: it makes the identity of job information sources salient and it populates the name of each source into subsequent questions asked about attributes of each particular source. Participant source utilization (as well as strength and frequency of relationship) is detailed in Table 4 below.

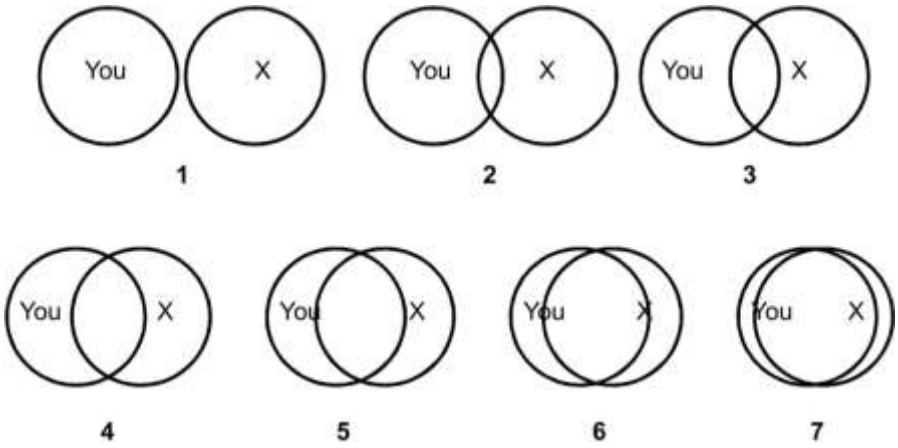
For each source used, participants also answered questions about strength of tie. A sample copy of the survey is included in Appendix B. The decision tree showing randomization in the survey is available in Appendix C. After detailing source use, tie strength, and frequency of interaction during the job search, participants were presented with source attribute questions (e.g., expertise, influence, etc.) for each of the sources they used.

Tie Strength

The primary predictor variable for this study is strength of tie. As detailed above, the literature generally argues for two measures of tie strength: closeness and frequency of interaction (for a discussion, see Marsden & Campbell, 1984; 2012). *Closeness* was measured using the inclusion of other in the self (IOS; Aron, Aron, & Smollen, 1992) scale. The IOS scale has good discriminant and convergent validity compared with more complex closeness scales (for a discussion, see Gächter, Starmer, & Tufano, 2015). IOS does so with only one item, a pictorial representation of the other and self as progressively overlapping circles (see Figure 4). Past research has used this as an indicator of tie strength (Levine & Kurzban, 2006; Rozzell et al., 2014; Vitak, 2012). Participants were given the following prompt: "Please select the picture that best describes your current relationship with the source you just named."

Figure 6

Inclusion of Other in the Self (IOS): Relationship Closeness Measure



Note: Image reproduced from Gächter, Starmer, and Tufano (2015)

Additionally, frequency of interaction (Granovetter, 1974) was used to capture tie strength (1 = never, 2 = once a year, 3 = several times a year, 4 = every few months, 5 = monthly, 6 = weekly, 7 = several times a week, 8 = daily). Though closeness and frequency of interaction are not the same, they are considered fundamental to tie strength conceptualization (Marsden & Campbell, 1984; 2012). Closeness and frequency of interaction are detailed for each source in Table 6. Because closeness was on a 7-point scale while frequency of interaction was an 8-point scale, frequency was normalized and put on a 7-point scale so each variable has equal weight in the combined strength of tie measure. These variables are theoretically linked and statistically related (r = .47, Spearman Brown = .64), so the combined Strength of Tie measurement was used in the regressions tests below. Because the structural model is based on hypotheses about the average strength of ties used, average tie strength across all sources was computed for hypotheses about average tie strength. Across all cases, closeness and frequency were also highly correlated (r = .51, Spearman Brown = .67). The average strength of tie measure ranged from 3.70 to 12.15, M = 6.88, SD = 1.62.

Table 6

Closeness and Frequency of Interaction by Source

	Inclusion of Other in the Self (IOS)		Frequency of Interaction			Correlation	Strength of Tie	
Source	***Mean***	***SD***	***Mean***	***SD***	***N***	**IOS and Frequency**	***Mean***	***SD***
Strong Tie Online	4.26	1.66	6.13	1.14	120	.43	9.63	2.27
Weak Tie Online	3.37	1.38	5.32	1.32	136	.38	8.03	2.11
Strong Tie In Person	4.56	1.59	6.28	1.14	130	.55	10.06	2.29
Weak Tie in Person	3.26	1.41	5.31	1.28	124	.48	7.90	2.18
Website	3.52	1.75	6.72	1.36	261	.29	9.40	2.38
Direct in Person	2.78	1.72	4.65	1.89	122	.65	6.85	3.06
Direct Online	2.55	1.51	4.57	1.84	205	.56	6.56	2.76
Career Event	4.57	1.84	2.56	1.62	45	.66	5.36	2.78
Job Board/Listserv	3.26	1.63	6.20	1.77	89	.44	8.68	2.70
Employment agency	2.74	1.46	5.05	1.62	65	.28	7.15	2.30

Note: IOS (Inclusion of Other in the Self) ranges from 1 – 7 with 1 indicating the weakest relationship and 7 indicating the closest relationship. Frequency is measured on the following scale: 1 = never, 2 = about 1 time a year, 3 = several times per year, 4 = every few months, 5 = monthly, 6 = weekly, 7 = several times per week, 8 = daily. All correlations are significant at $p < .001$.

Control Variables

There are several variables that need to be accounted for when examining job search information sources. Lin et al. (1981) suggest that both ascribed and acquired resources affect network composition and utilization. *Ascribed resources* are resources one person possesses from their family such as gender, race, and family history. *Acquired resources* are resources a person gains through personal experience and include income, education, and occupation. Several ascribed and acquired resources that predate the job search were used as controls in the regressions below. Specifically, control variables of ascribed resources of gender, race, and father's social status, as well as acquired resources of age, education, income, and social status are included in the regression analysis.

Additionally, new research about type of work and the unemployment process indicates that perceived social class matters in regard to job search (Gist, 2014; Wickert, Dougherty, & Gist, 2012). Specifically, Dougherty's (2011) explication of text-work and body-work is theorized to relate to the job-search process. Therefore, a text- and body-work scale developed by Rick, Zenalli, and Brandhorst (2016) was included in the analysis. This scale consists of seven items asking about the participant's conceptualization of their own work. Items include "I primarily use my hands/body to do my job" and "I spend most of my day sitting at a desk. A full list of items is available in Appendix A. Respondents rate agreement with each item on a 7-point Likert-type scale ranging from *1 = strongly disagree* to *7 = strongly agree*. The scale was reliable in this study, Cronbach's $\alpha = .93$.

Finally, at the node level, perceived homophily was measured and included as a

control. This was in response to Mouw's (2003; 2006) contention that network formation is based primarily on homophily. Homophily, or the notion that similarity promotes connection (McPherson, Smith-Lovin, & Cook, 2001), is one of the foundational principles of social network formation. SWT and job searches are not immune to this "basic organizing principle" that birds of a feather flock together (McPherson et al., 2001, p. 416). Mouw (2003) contends "research on social capital must take seriously the problem of differentiating between the nonrandom way in which friends are acquired and the subsequent effect of those friends on individuals' social and economic outcomes" (p. 891).

Mouw's analyses (2003; 2006) demonstrate that when homophily is accounted for, some of the value of contacts used during job search can be attributed to homophily rather than network structural factors. Perception of homophily was measured using a modified version of the attitude homophily subscale developed by McCroskey, Richmond, and Daly (1975) and an item from Anderson and de Mancillas (1978). Though homophily is often considered a network property, derived from shared attributes between partners (e.g., Lee, Kim, & Piercy, 2016), perceived homophily is an influential determinant of network perception. As McPherson et al. (2001) explain, we perceive those we rely on to be more similar to us in many aspects, even if they might not be actually similar. Therefore, this perceived homophily scale is appropriate for research on network perception. Three, 7-point semantic differentials were used to measure perceived homophily: "Is like me/Is unlike me," "Is different from me/Is similar to me," and "Has goals similar to mine/Has goals different from mine." The scale was reliable in the current study (Cronbach's $\alpha = .88$).

Average Homophily. Across the 1297 sources reported, average homophily was reliable, α = .87. Because H5 predicts effects of average support received, it was necessary to also aggregate the homophily control variable (i.e., average homophily of sources) for each participant. Perceived average homophily ranged from 1.25 to 6.0 (*M* = 3.90, *SD* = 0.87). This aggregated value was used in the unemployment duration analyses reported below.

Source Resources

Perceived expertise. The competence factor of McCroskey's (1966; McCroskey & Teven, 1999) scale of source credibility was used to measure perceived source expertise. This scale is concise and easy to rate, with six semantic differentials rated on a 7-point scale: intelligent/unintelligent, untrained/trained, inexpert/expert, informed/uniformed, incompetent/competent, bright/stupid. Previous reliabilities have been acceptable (McCroskey & Teven, 1999, α = .85). The scale was reliable in the present study (Cronbach's α =. 94).

Quality of information. A truncated and modified version of Sun, Zhao, and Zhu's (2015) scale of information quality from social question and answer websites was used to measure information quality. Participants were asked to rate, the quality of information each source could provide. Participants were prompted with the statement, "This source provides job information that is…" and five completion words: accurate, objective, complete, relevant, and novel. Items dropped from Sun et al.'s (2015) scale were: specific, valuable words, and language expression. The scale ranged from *1 = strongly disagree* to *7 = strongly agree*. Using an eight-item version of this scale, Sun et al. (2015) report high scale reliability (α = .88). The scale was reliable in the present

study (Cronbach's α = .84).

Perceived influence. A modified version of Anderson, John, and Keltner's (2012) sense of power scale, adapted for targets of job search, was used to measure influence. Respondents answered their degree of agreement (from *1 = strongly disagree* to *7 = strongly agree)* how well a source was capable of influencing others. This scale adaptation shifts the scale from personal power to perceived power of others. Shifting the target of power is consistent with Anderson et al.'s (2012) conceptualization of the scale. Participants responded to seven questions including: "This source's wishes do not carry much weight with a hiring organization," and "I think this source has a great deal of power over a hiring organization." A full list of items is available in Appendix A. The scale's reliability has been demonstrated across varied contexts and samples with a range of α = .77 - .91 (Anderson et al., 2012). In the present study, the scale was reliable, Cronbach's α = .94.

Social status. The scale of subjective social status (Adler, Epel, Castellazzo, & Ickovics, 2000; Ostrove, Adler, Kuppermann, & Washington, 2000) has demonstrated internal and external validity (e.g., Operario, Adler & Williams, 2004). This scale, like the IOS scale (Aron et al., 1992) for relational closeness, is a pictorial representation. Participants are presented an image of 10-rung ladder and given the following prompt:

> Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off – those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off – those who have the least money, least education, and the least respected jobs or no job. Where would you place [source name]/the people who contribute to [source name] on the ladder?

A visual depiction of this ladder is shown in Figure 5. On average, participants rated themselves as 4.58 (*SD* = 1.57, mode = 5, range = 1-9). They rated their father's social status as an average of 5.58 (*SD* = 2.01, mode = 7, range = 1-10).

Figure 7

Subjective Social Status



Note: Ladder adopted from Adler, Epel, Castellazzo, and Ickovics (2000)

Accessibility. Though network studies frequently measure accessibility through a single item (e.g., Su & Contractor, 2011), this study uses a three-item scale developed by O'Reilly (1982) focused on decision-makers' perceived accessibility. This scale uses source-directed questions to probe accessibility: "Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it. In general, how often is this the case with [source name]?" (anchors, 1 = *never*, 7 = *always*), "How accessible or easy is it to get job information from [source name]?" (anchors, 1 = *very easy*, 7 = *not easy at all*), and "How difficult is it on average to get information from [source name]?" (anchors, 1 = *very difficult*, 7 = *not difficult at all*). Scale reliability across three sources was high for O'Reilly (1982; α = .94). Initially, this scale was not very reliable, α = .69, dropping the first item increased reliability substantially, Cronbach's α = .77, *r* = .69, and Spearman-Brown = .77. Thus, items 2 and 3 were used for analysis, and the first item was dropped.

Social support. A truncated social support measure, adapted from Rozzell et al. (2014) and Carr et al. (2016), was used to test perceived social support. A seven-point scale was used to measure responses to the three highest loading semantic differentials: "supportive/not supportive," "positive/negative," and "encouraging/not encouraging." Participants were prompted with "Interaction with [source name] are," or in the case of the website "Interactions with contributors to [website name] are". Author's correspondence indicates these three items loaded at α = .87 in Rozzell et al.'s (2014) sample. In the present study, this short scale was very reliable, Cronbach's α = .96.

Average social support. Across the 1297 sources reported, social support was

reliable, α = .96. Because H5 predicts an effect for support received from all sources, an average of all social support was computed for each participant. Perceived social support ranged from 1.5 to 6.0 (*M* = 4.37, *SD* = 0.91). This aggregate value was used in the unemployment duration analyses reported below.

Perceived ability to bridge. Bridging estimates have generally been available only when comprehensive network data is collected (Hanneman & Riddle, 2005). However, the construct has been well defined in statistical method books (Hanneman & Riddle, 2005; Wasserman & Faust, 1995) as well as in theoretical explications (Burt, 1992; 2005; 2010). Thus, the concept of a network bridge covering a structural hole is well documented and has many synonymous terms. Indeed, the concept of a person connecting to unknown others is quite understandable to a network actor (Bruggeman, 2016). Therefore, a scale was developed for this study in order to test perceptions that a job information source can span a structural hole.

Using existing literature, six items were developed to measure this construct. Participants were asked the extent to which they agreed (1 = *strongly disagree*, 7 = *strongly agree*) that each source could connect them to otherwise inaccessible job information. The items for this scale are detailed in Appendix A and include: "[Source name] is capable of connecting me with information I could not otherwise access" and "[Source name] serves as an intermediary between myself and the job I sought." A modified version of the scale, detailed in the Pilot Study section below and modeled in Appendix A, was reliable with Cronbach's α = .82.

Job Seeker Attributes

Network size. Network size was measured using the summative network

composition scale developed by McCarty, Killworth, Bernard, Johnsen, and Shelley (2001). This method was used successfully in other studies (e.g., Boase, 2008) and asks participants to report the number of individuals they know in 16 relational categories (i.e., immediate family, other birth family, family of spouse or partner, coworkers, people at work that the participant doesn't directly work with, best friends/confidantes, people know through hobbies/recreation, people known through religious organizations, people from other organizations, school relations, neighbors, just friends, people known through others, childhood relations, people who provide a service, and other people).

This technique reduces that cognitive burden associated with recall of specific others in networks and yields a comparatively stable and valid measure of network size (McCarty et al., 2001). This method is as reliable as the more widely used scale-up network method in which individuals are asked to name the number of people they know in various sub-populations (e.g., people named Michael, Native Americans, commercial pilots) but takes less time and cognitive energy for participants (for a discussion, see McCarty et al., 2001). For the current study, sliders ranging from 0 – 150 were provided for each source named. Responses were then Windsorized, or trimmed, whereby responses above the 95th percentile for each variable were truncated to the closest whole value (Tukey, 1962). Based on the raw data, the average network size, including all 16 sources, was 279.05 (*SD* = 205.99). Table 7 shows the pre and post values for the raw data and the Windsorized and log transformed data.

Table 7

Network size pre and post Windsorization and Natural Log transformation.

Item	Pre-transformation							Post-transformation				
						Windsorized Values						
	Mean	Skew	S.E.	Kurtosis	S.E.	95th Percentile	Trimmed Mean	Mean	Skew	S.E.	Kurtosis	S.E.
Immediate family	11.76	4.98	0.14	29.62	0.29	36.40	9.98	2.11	0.28	0.14	0.25	0.29
Other birth family	14.74	3.38	0.14	14.66	0.29	53.50	13.07	1.93	-0.20	0.14	-1.15	0.29
Spouse/partner family	11.50	3.75	0.14	18.16	0.29	47.10	10.17	1.70	-0.07	0.14	-1.23	0.29
Coworkers	22.22	2.60	0.14	8.09	0.29	75.50	20.41	2.52	-0.71	0.14	-0.06	0.29
Others at work	22.88	2.45	0.14	6.05	0.29	101.40	20.97	2.26	-0.27	0.14	-1.00	0.29
Best friends	6.17	6.88	0.14	51.62	0.29	15.00	4.29	1.48	0.14	0.14	0.14	0.29
People known through hobbies	14.65	3.05	0.14	11.69	0.29	51.00	13.34	2.07	-0.30	0.14	-0.69	0.29
People known through religious organizations	10.66	3.54	0.14	14.17	0.29	62.80	9.14	1.07	0.98	0.14	-0.55	0.29
People known through other organizations	21.05	2.69	0.14	8.06	0.29	80.70	19.46	2.31	-0.39	0.14	-0.76	0.29
School relations	18.61	2.56	0.14	7.45	0.29	70.70	17.43	2.02	-0.05	0.14	-1.19	0.29
Neighbors	8.69	5.90	0.14	45.68	0.29	23.70	7.32	1.78	-0.31	0.14	-0.40	0.29
Just friends	22.66	2.65	0.14	7.64	0.29	83.50	21.38	2.69	0.41	0.14	-0.22	0.29
Known through others	32.10	1.87	0.14	3.20	0.29	113.50	31.19	2.96	-0.50	0.14	0.18	0.29
Childhood relations	15.09	3.30	0.14	12.71	0.29	73.70	13.69	2.03	-0.02	0.14	-0.70	0.29
People who provide a service	16.97	3.30	0.14	13.57	0.29	54.00	15.53	2.31	-0.24	0.14	-0.24	0.29
Other people	44.16	1.21	0.14	0.20	0.29	150.00	44.16	3.07	-0.67	0.14	-0.21	0.29

Uncertainty Discrepancy. Several past studies were used to derive the uncertainty discrepancy scale. Each past scale uses a situationally appropriate measure of uncertainty discrepancy (e.g., partner sexual health tests; Afifi, Dillow, & Morse, 2004). The scale for the current study consisted of five items on a seven-point scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Questions are included in the Appendix A (e.g., "During my last/current job search, I wanted/want to know more than I did/do about the job finding process," and "During my last/current job search, I knew/know less than I'd like to about how to best find a job"). A similar version of this scale used by Morse et al. (2013) demonstrated acceptable reliability at $\alpha = .83$. In this study the scale was reliable, Cronbach's $\alpha = .93$.

Task-familiarity. Task-familiarity was initially measured using a modified version of the scale created by Mom, Van Den Bosch, and Volderda (2007). This scale was informed by the original distinction by March (1991). Participants were prompted with instructions that read: To what extent during your last/current job search, did you engage in activities that can be characterized as follows. Five prompts comprised the scale for exploration task: "Searching for new possibilities with respect to jobs," "Evaluating diverse options with respect to jobs," "Focusing on strong renewal of job seeking skills," "Activities requiring a great deal of adaptability of you," and "Activities require you to learn new skills or knowledge." Responses were on a seven-point scale with anchors of 1 = *to a very small extent* and 7 = *to a very large extent.* This scale was reliable for Mom et al. (2007) at $\alpha = .86$.

Exploitation was initially measured using six-items and the same scale and instructions with Exploration. The items were: "Activities in which you have a lot of

accumulated experience," "Activities which rely on existing relationships," "Job search processes in which you have a clear understating of how to take action," "Activities in which you primarily focused on short-term goals," "Activities which you can properly conduct using your present knowledge at the time," "Activities which clearly fit into your existing knowledge." This scale has previously demonstrated reliability at $\alpha = .81$. However, both exploitation and exploration scales had some problems in the current study, and details about modified version and reliabilities are included in the Pilot Study section below.

Study 2: Survey Design

Though ego's perception of network characteristics may seem a debatable method for testing the network of job seekers, Yakubovich (2005) found a 96.2% match between self-reported and employer-reported use of contacts when reviewing use of personal contacts during the job search in Russia. In the survey used for current research, each participant responds to source attributes for each of the sources used; thus, it was important to take steps to control for order effects and to account for non-independence of observation between sources. Specifically, it was important to justify the internal validity of this survey design considering the potential for testing effects related to repeated exposure to the same questions (Campbell & Stanley, 1963; Singleton & Straits, 2005). To handle this issue, the survey was randomized in two ways. First, the survey asked the block of participant attributes (e.g., gender, age, occupation, uncertainty discrepancy, task-familiarity, etc.) and the blocks of source attributes (e.g. influence, information, expertise, etc.) randomly. Thus, roughly half of participants answered questions about the random subset of the source attributes first

(e.g., information quality, influence, etc.) and the other half answered the within-job seeker questions first (e.g., uncertainty discrepancy, task-familiarity, network size, etc). An example of a completed survey is available in Appendix B. A decision-tree of the survey randomization is available in Appendix C. The second type of randomization occurred within each block; questions were randomized so that participants answered each measure in a random order. This randomization helps to account for variation based on testing effects (Singleton & Straits, 2005).

Study 2: Analysis

Data cleaning. Participants who missed more than 50% of directed response questions (e.g., please select "agree" to show you read this question) were not included in the final dataset (n = 5). Data were carefully screened case-by-case for duplicate sources of job information (e.g., answering indeed.com to both direct online application and website) as well as for responses that were not applicable (i.e., many participants reported using a job agency but then wrote "none" or "N/A" in that field later in the survey). Each response was meticulously read through: duplicate, multiple, and null responses for job sources were removed.

Next, the data were tested for multivariate outliers. As recommended by Tabachnik and Fidell (2013), Maholanobis distances were generated from individual level items (i.e., text-body work, social status, network size, uncertainty, exploration, exploitation, average tie closeness, age, and sex) to test for mulitvariate outliers. Tabachnik and Fidell (2013) recommend, "A very conservative probability estimate for a case being an outlier, say, $p < .001$ for the X^2 value" (p. 74). Adopting this recommendation for conservative judgment, eight cases, who were multivariate outliers

at $p < .0001$, were removed from analysis. Thus, final sample included 285 participants who used average 4.60 sources ($SD = 2.07$).

Many of the source attribute scales measure similar and related source traits. For instance, the usefulness and helpfulness of a source are likely highly correlated. To avoid issues with construct overlap and, specifically, multicollinearity, scales were entered into a regression model with a dummy outcome variable and collinearity diagnostics were checked according to Tabachnik and Fidell's (2013) recommendation. Specifically, variables were checked for: (a) correlations greater than .90, (b) tolerance scores less than .10, (c) variance inflation factor scores of greater than 10, and (d) conditioning index values greater than 30 with variance proportions greater than .50 for any single factor. In all, both extensive survey design and data cleaning procedures, outlined here, ensure minimal chance of having influences from either testing effects or independence of observation issues. Both the survey design and data cleaning procedures add confidence to the findings reported below.

Finally, one of the basic assumptions of parametric statistics in general and general linear model (GLM) procedures, specifically, is an independence of observations or independence of errors (Field, 2009; Tabachnik & Fidell, 2013). However, the data does not meet this assumption because measuring the same items for each source from the same participant several times violates the assumption of independent measurement errors. Dow, Burton, and White (1982) call this nonindependence between ego and alters *network autocorrelation*. In the case of source attributes, each control variable (e.g., age, education, sex, etc.) would have to be entered in the dataset several times (once for each source reported) which leads to unstable beta

values and inflated effect sizes in ordinary least squares (OLS) regression (Dow et al., 1982). There are several methods to correct network autocorrelation: random sampling of the data, fixing the effects for participants by creating control variables, or with full-network data computing a quadratic assignment procedure (QAP) score (see, Krackhardt, 1988 and Simpson, 2001).

In this case, the data were randomly sampled with only one source used for each participant. Though this removes much of the source ratings, a random sampling represents a conservative approach that allows all covariates to be entered separately (for a discussion, see Levin & Cross, 2004). An second sample of data was tested to ensure no relationships were present because of this technique and no differences were found in the findings reported below. Additionally, a second type of analysis, a regression model with dummy codes for each participants (i.e., 285 dummy variables, one for each participant) was computed as a *post hoc* test. This test is detailed after the between source hypotheses.

Study 2: Pilot Study

A pilot test was conducted to ensure the survey was readable and could be answered without issues. Thirty-nine MTurkers took a preliminary version of the survey. Pilot participants used an average of 5.41 sources. Results of pilot data analysis showed that most variables were normally distributed and reliable. Two issues however were also revealed in this pilot.

The first issue revealed from the pilot study was the bridging scale that was negatively skewed (-1.00, *SE* = .23) and kurtotic (1.59, *SE* = .45) so two items were reverse coded in the main survey and word indicating degree, like “very,” were

removed. The updated scales are included in Appendix A. The updated bridging scales remained reliable with non-significant skewness and kurtosis.

Second, the exploitation and exploration scales were not reliable enough and a principle component analysis (PCA) revealed four, instead of two, factors of the scales. In light of these additional factors other than the two (i.e., exploitation & exploration), additional items were created based on past literature to help clarify the dimensions of exploration and exploitation and to provide a more reliable measure. The full list of added measures and final scale is reported in Appendix A.

To examine the new scales, Tabachnik and Fidell's (2013) recommendations for PCA analysis were employed. Because it is inappropriate to conduct exploratory analyses (i.e., PCA) and confirmatory factor analyses (CFA) with the same data (Brown, 2001), and the updated scale was not included in the pilot study, a subset of the full sample was used to conduct the PCA and the remaining cases were included in the CFA and Structural Model below. The first 50 responses from the full sample were used to conduct a PCA. Next, items with measures of sample adequacy (MSA) of less than .7 were removed one-by-one. Third, items with communality scores of less than .6 were removed. Finally, items that cross-loaded (more than .35 on each any two components) were removed. Finally, once the scale was reduced to two dimensions the PCA was re-run. Because the factors were expected to share variance, the oblique direct-oblimin rotation was used (Field, 2009). Though a parsimonious solution of two factors was present, the primary factor was composed of both exploration and exploitation measures. Since most past literature has used a unidimensional measure (Hansen et al., 2001), a unidimensional solution was retained. This was theoretically consistent, but did

not allow the test of exploration and exploitative hypotheses proposed in this study. The retained scale included items which suggested the use of many types of ties was necessary during the job search. Specifically, the retained items were: "I relied on existing relationships for job opportunities," "I relied on my close friends and family members to help me find a job," "I called on a diverse group of people to help me find a job," "The job search process is about fostering existing relationships with people I am close to," and "The job search requires me to focus on networking." Component loadings are reported in Appendix A.

Finally, in this pilot, participants were asked: "Did you find any part of this survey confusing or difficult to understand? If so, your feedback will be used to modify the survey in the future." One participant mentioned that "It was a little confusing answering questions about the employer I applied to directly online…"; another participant wrote of the websites he rated, "Those are just sites and they just display the information, so there is no communication." However, inspection of these participants' responses revealed that both rated themselves as closer with websites than with human-to-human sources. Further for both participants, there was variance in responses across all scales. Thus, it was concluded that while it was unusual to think about websites as being influential or similar to oneself, participants were generally able to provide meaningful responses for such measures. However, this open-ended question was also included in the main study to ensure participants were not confused by the questionnaire.

Study 2: Main Study

Regressions for source attributes and tie strength. Most hypotheses and research questions proposed in the first half of this study dealt with the relationship between strength of tie and resources the tie was perceived to possess. The number of each type of source from the sampled data is depicted in Table 8 below. The correlations within this sampling of sources are shown in Table 9.

Table 8

Sources and Strength of Ties in the Randomly Sampled Dataset

	N	Strength of Tie *M*	Strength of Tie *SD*
1. Strong online	17	10.32	2.13
2. Weak online	31	7.54	2.17
3. Strong in person	25	9.86	2.10
4. Weak in person	32	8.16	2.09
5. Websites	64	9.45	2.10
6. Job board	24	9.23	3.19
7. Employment Agency	15	7.38	1.77
8. Career fair	9	5.89	3.11
9. Direct online application	47	6.88	2.77
10. Direct in person application	21	6.56	3.10
Totals	285	8.31	2.72

Table 9

Correlation Source Attributes Sample

	Measure	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	Strength of Tie	8.31	2.72	--																	
2.	Unemployment Duration	6.94	8.44	-.09	--																
3.	Age	35.86	9.03	-.05	.14*	--															
4.	Income	5.55	3.02	-.01	-.10	.09	--														
5.	Education	4.15	1.30	-.02	-.07	.11	.31***	--													
6.	White	0.86	0.34	-.05	.00	.06	-.01	-0.13	--												
7.	Male	0.52	0.50	-.12*	-.10	-.07	-.02	.00	.03	--											
8.	Body Work	3.27	1.72	-.06	.05	-.10	-.17	-.36***	.05	.12*	--										
9.	Social Status	4.58	1.57	.00	-.21***	-.01	.52***	.34***	-.03	.05	-.24***	--									
10.	Source Homophily	3.10	1.30	.26***	-.06	-.01	.17***	.01	-.00	-.11	-.01	.16***	--								
11.	Network Size (LN)	5.35	0.75	.02	-.02	.06	.21***	.15**	-.02	-.09	-.10	.23***	.05	--							
12.	Information Quality	5.33	0.93	.27***	-.10	-.19***	.08	.05	-.01	-.02	-.07	.12*	.41***	.08	--						
13.	Expertise	5.59	1.09	.24***	-.16**	-.07	.11	.00	.00	-.09	-.12*	.19***	.51***	.02	.65***	--					
14.	Source Status	5.94	1.67	.08	-.06	-.04	.17**	.12*	-.04	-.06	-.18	.32***	.06	.07	.23***	.42***	--				
15.	Social Support	5.40	1.38	.29***	-.09	-.06	.03	-.01	.05	-.05	-.02	.12*	.51***	.07	.56***	.63***	.17**	--			
16.	Source Influence	4.32	1.54	-.07	-.08	-.11	.05	-.09	-.02	.10	.06	.17**	.15**	.03	.29***	.44***	.36***	.29***	--		
17.	Bridging	5.22	1.15	.21***	-.04	-.05	.05	.02	.03	.05	-.07	.08	.28***	.08	.58***	.51***	.20***	.33***	.29***	--	
18.	Ease of access	5.55	1.35	.26***	-.09	-.05	.10	-.01	.03	.00	-.01	.17**	.50***	-.02	.54***	.46***	.01	.49***	.11	.34***	--

Note: **p* < .05, ** *p* <.01, ****p* < .001

To test hypotheses, a hierarchical regression was conducted with tie strength as the criterion variable. As mentioned above, for each participant one of the ties reported was s using a random number generator. That tie's strength was entered into a hierarchical regression as the criterion variable. The first block entered into the regression contained the covariates detailed above including both ascribed and acquired resources that may affect a person's job search. Next, a block testing hypotheses (H1, quality of information; H2, source status; H4, social support) and research questions (RQ1, expertise; RQ2, influence) was entered in the regression.

The covariate of father's social status was not significant (p = .99) but contained 17 missing cases and was removed from further analyses. Additionally, there was an issue with multicollinearity between expertise and information quality (r = .65). While expertise and information quality were singular in the regression, a principal component analysis with Varimax rotation showed unique variance in each set of items (see Appendix A). However, centering the variables, as recommended by Field (2009), eliminated the collinearity issue and both were included in subsequent analysis.

The first step of the regression model included covariates and was significant, F (9, 275) = 3.05, p = .002, R^2 = .09, with the covariates accounting for 6.1% of the variance (R^2_{adjusted} = .06). The only significant covariate predictor was perceived homophily (β = .27, p < .001); it remained marginally significant after the hypothesized effects were entered in the second step (β = .13, p = .056).

The second step in this regression was to test hypotheses and answer research questions. This model containing the hypothesized relationships was significant, F (14, 270) = 3.87, p < .001, R^2 = .17. The block of hypothesized variables accounted for

12.4% of the variance ($R^2_{adjusted} = .12$). The relationship between information quality and strength of tie was not significant ($p = .075$); thus, H1 was not supported. This means that information quality was not significantly related to strength of tie. Expertise was not related to strength of tie either ($p = .85$); thus, the answer to RQ1 is that, when controlling for other perceived source attributes, there is no significant effect of expertise on strength of tie. Social status of the source was also not significantly related to strength of tie ($p = .21$), leaving H2 unsupported.

Social support was significantly related to strength of tie ($\beta = .18$, $p = .019$), supporting H4. That means social support was positively related to strength of tie: stronger ties are perceived to provide greater social support. RQ2 asked what relationship exists between perceived source influence and strength of tie. Results showed that source influence was negatively related to tie strength ($\beta = -.21$, $p < .001$). Thus, the answer to RQ2 seems to be that perceived source influence was associated with weaker ties, which means weaker ties are perceived to have more influence in job search.

In sum, the perceived homophily covariate was marginally and positively related to tie strength suggesting that those on is close to and interacts with frequently are perceived as similar. Strength of tie was significantly predicted by perceived social support, supporting H4, and negatively predicted by perceived influence of source, answering RQ2. However, source status, expertise, and information quality did not relate to tie strength. The full results are shown in Table 10.

Table 10

Regression Results for Strength of Tie (H1, H2, H4, RQ1 & RQ2)

	B	*SE B*	*β*	*t*	ΔR^2
Step 1: Controls					
					.091***
Age	-0.02	0.02	-.06	-0.95	
Income	-0.04	0.06	-.05	-0.66	
Text/Body Work	-0.12	0.10	-.07	-1.16	
Education	-0.05	0.14	-.02	-0.33	
Own Social Status	-0.06	0.12	-.03	-0.46	
White	-0.36	0.46	-.05	-0.78	
Male	-0.46	0.32	-.08	-1.42	
Net Size (Log)	0.05	0.22	.01	0.24	
Homophily	0.56	0.12	.26	4.47***	
Step 2: Variables of Interest					
					.076***
Age	-0.01	0.02	-.03	-0.48	
Income	-0.03	0.06	-.03	-0.45	
Text/Body Work	-0.06	0.10	-.04	-0.64	
Education	-0.10	0.13	-.05	-0.76	
Own Social Status	-0.06	0.12	-.04	-0.50	
White	-0.49	0.45	-.06	-1.11	
Male	-0.33	0.31	-.06	-1.03	
Net Size (Log)	0.01	0.21	.00	0.05	
Homophily	0.29	0.14	.13	1.92~	
Information Quality	0.41	0.23	.14	1.79	
Expertise	0.05	0.24	.02	0.19	
Source Status	0.14	0.11	.09	1.28	
Social Support	0.36	0.15	.18	2.36*	
Influence	-0.38	0.12	-.21	-3.21**	

~ $p = .056$, * $p < .05$, ** $p < .01$, *** $p < .001$

Hypothesis 3 proposed a curvilinear relationship between accessibility and tie strength. This relationship was tested via a polynomial regression with the criterion variable, strength of tie and the predictor of accessibility. Though the model was significant for both the linear (F [1, 283] = 20.63, $p < .001$, $R^2 = .068$) and the quadratic function (F [2, 282] = 10.34, $p < .001$, $R^2 = .068$), only the linear model produced a significant predictor ($\beta = .26$, $p < .001$); the linear ($p = .255$) and quadratic parameters ($p = .731$) were both non-significant in the quadratic model. This means that the relationship between accessibility and strength of tie is direct and positive. In all, the stronger the tie, the easier it is to access. Therefore, H3 was not supported.

Unemployment duration. Unemployment duration was predicted to negatively relate to social support received (H5) and average network size (H6). The distribution of unemployment duration was not normal. Specifically, unemployment duration had issues with the linearity assumption. The scale was bi-modal with 26.3% of participants ($N = 75$) reported no unemployment period, and 58.2% reported being unemployed 3 months or less ($N = 166$). Further, 7.5% of participants ($N = 21$) reported unemployment duration of 30 months or more. In all, unemployment duration was not normally distributed enough to proceed with regression analysis ($M = 6.94$, $SD = 8.44$, skewness = 1.99, $SE_{\text{skewness}} = .14$, kurtosis = 2.91, $SE_{\text{kurtosis}} = .29$). A logarithmic transformation helped normalize the distribution of the data ($M = 1.35$, $SD = 1.07$, skewness = .32, $SE_{\text{skewness}} = .14$, kurtosis = -.79, $SE_{\text{kurtosis}} = .29$.

A regression with the criterion variable of (natural log of) unemployment duration and predictors of network size and average social support received was computed using the same covariates as above. In the first step, the covariates were

entered. The covariates model was significant, $F(8, 276) = 2.21$, $p = .049$, $R^2 = .054$. The covariates accounted for 2.7% of the variance in unemployment duration ($R^2_{adjusted} = .03$). However, the only significant control variable predicting unemployment duration was job seeker's social status ($\beta = -.16$, $p = .025$). Those who reported a higher social status experienced shorter unemployment durations. Next, social support and network size were entered in the second step of the equation. The change in R^2 was not significant ($p = .550$). Therefore, both H5 and H6 are rejected. In all, it seems unemployment duration is negatively related to one's social status, which means the higher one's social status, the shorter the person's unemployment duration. Contrary to past evidence, in this sample unemployment duration is not related to network size (Van Hoye et al., 2009) or social support (Fieseler et al., 2014) received. Results of this regression are shown in Table 11.

Table 11

Unemployment Duration Regression (H5 & H6)

	B	*SE B*	*β*	*t*	ΔR^2
Step 1: Control					
					.054*
Age	0.00	0.01	0.07	1.15	
Income	-0.02	0.03	-0.06	-0.86	
Text/Body Work	0.00	0.04	0.01	0.11	
Education	-0.01	0.04	-0.01	-0.08	
Own Social Status	-0.11	0.05	-0.16	-2.27*	
White	-0.00	0.19	-0.00	-0.07	
Male	-0.11	0.13	-0.05	-0.92	
Homophily	-0.06	0.07	-0.05	-0.55	
Step 2: Variables of Interest					
					n.s.
Age	0.01	0.01	0.07	1.19	
Income	-0.02	0.03	-0.05	-0.78	
Text/Body Work	0.00	0.04	0.00	0.09	
Education	0.00	0.06	0.00	-0.05	
Own Social Status	-0.10	0.05	-0.15	-2.03	
White	0.00	0.19	0.00	-0.09	
Male	-0.12	0.13	-0.06	-1.00	
Homophily	-0.06	0.09	-0.05	-0.45	
Network Size (Log)	-0.10	0.09	-0.07	-1.08	
Average Social Support	0.00	0.08	0.00	-0.23	

*$p < .05$, **$p < .01$, ***$p < .001$

Source bridging. To test H8, whether online sources are perceived as better liaisons or bridges than other sources, an analysis of variance (ANOVA) comparing all categories of job information source was conducted. The outcome variable was the new bridging scale developed for this study. Results for the overall model were marginally significant ($p = .07$). However, *post hoc* comparisons showed no statistically significant differences between sources or the mean level. Therefore, the bridging scores were not significantly predicted by source type; thus, H8 was not supported.

Post Hoc test including all between source variables. Because there are multiple ways to address network autocorrelation (see, Dow et al., 1982; Simpson, 2001) and there are source attribute variables left out of the first regressions (i.e., bridging and ease of access were excluded based on the hypotheses posed), a *post hoc* analysis of all source attributes was computed. This *post hoc* analysis introduces fixed effects with a dummy variable for each job seeker, providing a control for network autocorrelation issues. As Levin and Cross (2004) explain, "Besides correcting for much of the nonindependence, these [dummy variables] also served to control for any respondent characteristics such as age, education, gender, job tenure, company, and so on. This approach does tax our degrees of freedom, but our sample size remains more than adequate for OLS procedures" (p. 1483). Given the 1296 sources used by these 285 job seekers, there were certainly sufficient degrees of freedom in this analysis. Thus, this *post hoc* test allows for the addition of both bridging and ease of access. The final benefit of this robust and comprehensive *post hoc* test is a second regression excluding online-only sources (i.e., websites and direct online application) can be computed to assure that tie-strength correlates are not driven by the pervasive use of online sources.

This *post hoc* analysis is reported in Table 12 below. The first model includes all sources and was significant, $F(292, 1004) = 16.25$, $p < .001$, $R^2 = .46$. The second model excludes online-only sources (websites and direct online application) and was also significant, $F(271, 599) = 2.10$, $p < .001$, $R^2 = .51$. In both tested models, the first including all sources and the second model excluding websites and direct online application, the results were significant for the same predictors as reported above. Namely, strength of tie was positively associated with social support (all sources: $\beta = .15$, $p < .001$; excluding online only sources: $\beta = .16$, $p = .006$) and negatively associated with influence (all sources: $\beta = -.31$, $p < .001$; excluding online only sources: $\beta = -.16$, $p < .001$).

In addition, as shown in Table 12, bridging ($\beta = .12$, $p < .001$) and ease of access ($\beta = .16$, $p < .001$) were both significantly and positively predicted tie strength when all sources were included. However, bridging was no longer significant when online-only sources were excluded, ($p = .39$) while ease of access remained significant ($\beta = .13$, $p = .008$). These *post hoc* findings add confidence to the findings above but suggest that bridging is associated with online-only sources of job information. Further, these findings clarify the importance of homophily which was significant in the all sources model ($\beta = .10$, $p = .005$) and in the model with the online-only sources excluded ($\beta = .17$, $p < .001$). These tests results provide confidence to the findings from the regressions above for H1 to H8, RQ1, and RQ2. In all, with all source attributes included, expertise and information quality of job sources are not related to tie strength. However, tie strength is positively related to social support and ease of access, negatively related to influence, and related to perceived bridging when online-only

sources are included. Therefore, as closeness and frequency of interaction increase (i.e., tie strength), job seekers view their job information sources as providing greater support, as easier to access, and as more similar to them. In contrast, those information sources who job seekers were not close to and interacted with infrequently were seen as more influential.

Table 12

Post Hoc Regression Using Job Seeker Dummy Variables

	All Sources					*Excluding Online-Only Sources*				
	B	*SE B*	*β*	*t*	ΔR^2	*B*	*SE B*	*β*	*t*	ΔR^2
Step 1: Participant dummy variables										
Participant dummy variables					.322***					.399***
Step 2: Control					.038***					.063***
Homophily	0.52	0.07	.25	7.79***		0.67	0.08	.37	8.15***	
Step 3: Variables of Interest					.101***					.042***
Homophily	0.21	0.07	.10	2.79**		0.34	0.10	.17	3.38**	
Information Quality	0.19	0.13	.06	1.43		0.16	0.19	.05	0.84	
Expertise	0.01	0.13	.00	0.08		-0.05	0.17	-.02	-0.26	
Source Status	-0.02	0.06	-.01	-0.32		-0.14	0.09	-.09	-1.60	
Social Support	0.29	0.08	.15	3.78***		0.33	0.12	.16	2.77**	
Influence	-0.38	0.12	-.31	-9.85***		-0.31	0.09	-.16	-3.33**	
Bridge	0.27	0.08	.12	3.56***		0.10	0.11	.04	0.86	
Ease of Access	0.33	0.07	.16	4.53***		0.27	0.10	.13	2.68**	

*$p < .05$, **$p < .01$, ***$p < .001$

Structural model of within-person influences. To test the relationships proposed in H9 to H13 (for a summary, see Figure 5), a structural equation model (SEM) was computed. Importantly, all hypotheses for this model were unable to be tested because exploration and exploitation formed a unidimensional measure of task-familiarity (as reported in the Pilot Study section above). Nevertheless, the unidimensional measure was tested with the endogenous variables detailed in the hypotheses. SEM serves two primary purposes: validating measurement models (i.e., the part of the model relating measured items to factors) and fitting structural models (i.e., the hypothesized relationships between constructs) (Garson, 2012; Tabachnik & Fidell, 2013).

LISREL 9.2 (Jöreskog & Sörbom, 2015) was used to compute the measurement model and subsequent structural equations using the maximum likelihood estimation (Kline, 2011; Marayama, 1998). The assumptions of the model were first investigated using SPSS 22. Two participants had missing values, and the data appeared to be missing at random; however, LISREL does not tolerate missing cases so these two participants' cases were not included in the SEM analysis. Skewness and kurtosis of each variable was examined and the data for network size was transformed and Windsorized as detailed in Table 5, above.

Measurement model. A measurement model was constructed to confirm the PCA results for the task-familiarity scale and verify the other scales used in the subsequent structural equation model (SEM). In the measurement model, the exogenous latent variable (i.e., network size) and endogenous mediators (i.e., task-familiarity and uncertainty) were allowed to covary. The paths specified by the *a priori* measures and

pilot study were freed and the model was computed. Each measurement model and structural model reported below relies on LISREL's Maximum Likelihood (ML) estimation. The model was sufficiently identified; that is, it had a sufficient number of indicators to allow for all paths entered in the measurement model (Marayama, 1998).

Initially, bivariate correlations between subscale items were examined to determine if items appropriately explained the latent variables. DeVellis (2003) recommends correlations of moderate magnitude or better (i.e., $r^2 > .30$). While many items for the network scale failed to meet this criteria (with r^2 between .12 and .49, m = .29), it was determined that the face-validity of the network measure (McCarty et al., 2001) warranted testing all measured relationships. All other items for uncertainty and task-familiarity were above this threshold. Next, the remaining items' scale reliabilities (i.e., Cronbach's alpha) were computed using SPSS. As reported in the Measures section, each scale had sufficient reliability to proceed; scale reliabilities were computed for network size ($\alpha = .85$), task-familiarity ($\alpha = .84$), and uncertainty ($\alpha = .91$).

Kline (2011) recommends reporting measures of incremental fit (i.e., CFI), parsimony (i.e., RMSEA and GFI), and absolute fit (i.e., SRMR). Low RMSEA and SRMR values, near 0, are preferable; values of GFI and CFI near 1.0 indicate the best fit (Kline, 2011). Hu and Bentler (1999) provide more specific values for each type of fit: CFI $\geq .95$, RMSEA $\leq .06$, and SRMR $\leq .08$. There is much debate about the use of cutoffs to determine fit. Most scholars argue against a strict reliance on cutoff values (Kenny, 2014). Overall, these fit indices, together, provide a "*qualitative* or *descriptive* information about the fit of the model" (Kline, 2011, p. 205, emphasis in the original). It

is important to note that as the number of cases in the data increases, the likelihood of a significant Chi-square value increases as well.

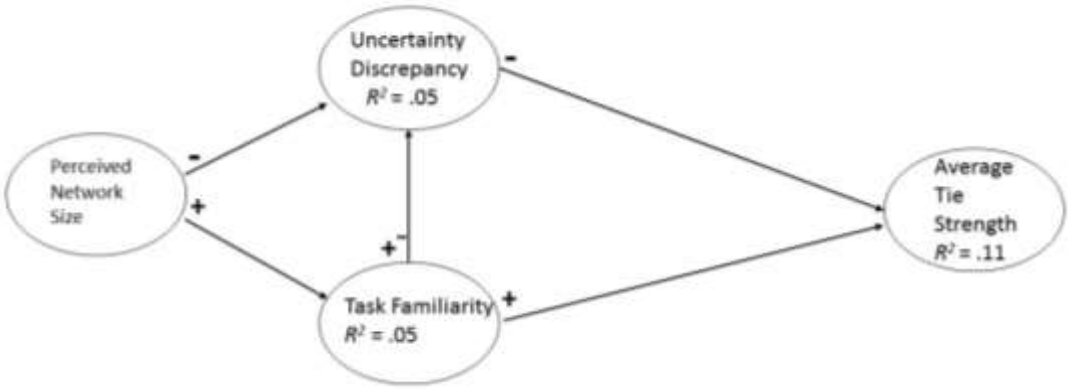
The initial measurement model fit relatively well, χ^2 (319) = 652.96, $p < .001$, Steiger-Lind root mean square error of approximation (RMSEA) was .07, Jöreskog–Sörbom Goodness of Fit Index (GFI) was .84, Bentler Comparative Fit Index (CFI) was .86, and Standardized Root Mean Square Residual (SRMR) was .06. However, this model did leave room for improvement. The modification indices were examined and modifications allowing error covariance within each of the latent constructs were added between items when they significantly improved model fit. Several paths were added within the uncertainty scale, network scale, and the task-familiarity scale. Each of these error covariances was permitted when they were related items within a latent construct. As a result of these modifications, the model fit improved significantly, χ^2 (5) = 207.17, $p < .001$. The final measurement model fit was: χ^2 (314) = 445.79, $p < .001$, RMSEA = .04, GFI = .88, CFI = .95, and SRMR = .06. Though the Chi-square value was significant, which is expected in models with $N > 200$, the relative Chi-sqaure (χ^2/df) was reasonable, 1.41 (Tabachnik and Fidell [2013] recommend a threshold of < 2). Thus, the analysis proceeded with the proposed structural model.

Structural model. The average strength of tie measure was used as a single-item indicator as the final exogenous variable in the structural model. Fit details for the models discussed here are included in Table 13, below. The hypothesized structural model fit relatively well, and LISREL indicated no structural modifications to significantly improve model fit, χ^2 (316) = 453.72, $p < .001$, RMSEA = .04, GFI = .88, CFI = .94, and SRMR = .07. Thus, this model was interpretable; however, alternative

models were still specified and tested as recommended by the literature (Tabachnik & Fidell, 2013).

Figure 8

Final Structural Model, Model 3 in Table 13



Note: ~ indicates significant at the .052 level

To ensure this model was appropriately specified, an alternative model with only the highest loading network size indicators (6 indicators loading at $r^2 > .30$) was tested (Model 2, Table 13). Though the Chi-square index was improved significantly in this model, all results had similar *r*-values in the same direction, so the model with the full network measure was retained (i.e., Model 1 in Table 13). Another alternative model created a path between network size and uncertainty (Model 3 in Table 13), and this model represented a significant improvement over the hypothesized model and, thus, was used for analysis below. This final model is presented in Figure 8 above. Because of the limited number of endogenous variables (i.e., uncertainty, task-familiarity, and tie strength), no other plausible alternative models could be tested.

Job Seeker Perception Hypotheses. Hypothesis 8 and 9 predicted relationships between task-familiarity and tie strength. The unidimensional measure that was retained focuses on using a broad set of contacts (e.g., calling on a diverse set of people, focusing on networking, relying on existing relationships; see the full scale in Appendix A) during the job search. Thus, this measure should be related to the use of disparate weak ties. This unidimensional measure of task-familiarity variable was used to test these hypotheses. The SEM shows a positive relationship between the task-familiarity measure and tie strength, $\beta = .44$, $p < .001$. This result is in opposition to the proposed relationships. When a job seeker reports needing to call on a wide variety of contacts during the job search, they tend to use stronger ties on average.

Hypothesis 10 predicted that uncertainty discrepancy was positively related to average tie strength. The SEM results did not support H10. Contrary to the hypothesis, the relationship between uncertainty discrepancy and tie strength was significant and

negative, β = -.35, p = .001. Thus, as participants felt increased uncertainty about their job search, they tended to turn to weaker ties on average, not stronger. Again, this finding contradicts the proposed model.

Hypothesis 11 predicted uncertainty discrepancy was related to task-familiarity. A significant relationship was present between the unidimensional task-familiarity measure and uncertainty discrepancy. Specifically, task-familiarity was positively related to uncertainty discrepancy (β = .15, p = .052). This relationship seemed to be contrary to the predictions: when participants reported the job search process as a familiar task in which one calls on diverse network of ties, they reported increased uncertainty discrepancy. Thus, H11 was not supported by the model. The evidence suggested that perceptions of the job search as a task dependent on a complex network have greater, not less, uncertainty discrepancy. Restated, in terms of task-familiarity, those who are familiar with the job search as a process using social connection actually reported greater levels of uncertainty outside of their comfort.

Hypothesis 12 predicted the relationship between task-familiarity and average tie strength was partially mediated by uncertainty discrepancy. This relationship was supported by the SEM; however, the influence was not in the direction of the prediction. The results from H11 show as task-familiarity scores increased (i.e., job seekers saw the job search as a network problem) so did uncertainty discrepancy. However, as job seekers experienced uncertainty discrepancy they tended to use weaker, not stronger, ties (H10). Thus, uncertainty discrepancy had a buffering effect, on the relationship between task-familiarity and average tie strength. Figure 8 shows that while task-familiarity prompted the use of stronger ties on average, this effect was reduced as

participants experienced greater uncertainty discrepancy and tended to use weaker ties on average.

Figure 8 shows that as perceptions of the job search requiring a wide network increased, so did uncertainty discrepancy. This is signaled by the direct positive effect task-familiarity has on average tie strength and the indirect effect that task-familiarity has through uncertainty discrepancy. Specifically, when task-familiarity scores increased so did the use of stronger ties, on average. At the same time, as uncertainty discrepancy increased, the use of weak ties increased. This complex model suggests that job seekers used ties in relation to their views of the task as a network-search and their feelings about how uncertain they were, beyond their comfort level, about the job search. Thus, the results seem to be contradictory of the relationship proposed by H12. In all, the relationship between task-familiarity and average tie strength used is partially mediated by uncertainty discrepancy to predict 11.1% (R^2 = .11) of the variance in average tie strength (Baron & Kenny, 1986).

The complete structural equation shows that network size was related to both task-familiarity (β = .21, p = .005) and to uncertainty discrepancy (β = -.21, p = .005). As network size increased so did the tendency to view the job search as a complex networked problem (i.e., task-familiarity); in contrast, as network size was smaller, job seekers tended to experience greater uncertainty discrepancy. In all, as network size increased, uncertainty discrepancy decreased and task-familiarity increased. Further, network size had a positive indirect effect on the average strength of tie used (β = .16, p = .015). That means as network size increased, so did the use of stronger ties during the

job search, on average. Restated, the opposite holds as well: as network size decreased, so did the uncertainty discrepancy and, in turn, average strength of tie used.

Table 13

Fit Statistics for Alternative Models

				Parsimonious fit	*Incremental fit*		*Absolute fit*	
	Model	X^2	*df*	RMSEA	CFI	SRMR	GFI	Chi-Square Significance (*p*) versus Model 1
1.	Hypothesized Model	453.71	316	0.04	0.94	0.07	0.88	
2.	Limited Network Size Measures	146.70	99	0.05	0.97	0.06	0.93	< .001
3.	**Adding a path from Network Size to Uncertainty Discrepancy	445.79	315	0.04	0.95	0.06	0.88	= .005

** *is the model displayed in Figure 8 and reported in hypotheses.*

Finally, *post hoc* comparisons and explanations were necessary to decipher which ties were considered stronger and weaker by participants. As shown in Table 6, weaker ties (based on frequency of use and closeness) during the job search included career fairs (M = 5.36, SD = 2.78), direct online application (M = 6.56, SD = 2.76), direct in person application (M = 6.85, SD = 3.06), employment agencies (M = 7.15, SD = 2.30), weak-ties in-person (M = 7.90, SD = 2.18), and weak-ties online (M = 8.03, SD = 2.11). In contrast, strong ties based on frequency of use and closeness during the job search included websites (M = 9.40, SD = 2.38), strong-ties online (M = 9.63, SD = 2.27), and strong-ties in-person (M = 10.06, SD = 2.29). In fact, between the strongest weak tie (i.e., weak ties online) and the weakest strong tie (i.e., websites), the differences were significant, $t(395) = 5.68$, $p < .001$. Interestingly, this difference signals that websites are comparatively strong ties during the job search, likely because of the frequency with which participants interact with these sources. Perhaps this is why ease of access was positively associated with tie strength, in opposition to the hypothesized curvilinear relationship.

Job seekers rated websites as strong ties during the job search. However, unlike a human strong or weak connection, there is no social costs associated with accessing a website or online application. Decomposing the tie strength relationships via *post hoc* comparisons of frequency of interaction and closeness dimensions across online and offline ties helps make this point: independent sample *t*-tests show no difference in frequency between online and in person strong ties (p = .30) or weak ties (p = .92). Nor is there any difference in closeness between strong ties (p = .14) or weak ties (p = .53) accessed online versus face-to-face. However, there are differences in frequency

between strong ties accessed online (M = 6.13, SD = 1.44) and websites (M = 6.72, SD = 1.36), $t(379) = -4.11$, $p < .001$. Further, a significant difference in closeness exists between strong ties accessed online (M = 4.26, SD = 1.66) and websites (M = 3.52, SD = 1.75), $t(379) = 3.88$, $p < .001$. For these job seekers, strong social ties are strong because of closeness while strong technological ties are strong due to frequency of interaction. A summary of all results from study 2 is presented in Table 14, below.

Table 14

Summary of Results from Study 2

Hypotheses and Research Questions	Results
Between Source Motivations	
H1. For job seekers, perceived quality of job information is negatively associated with perceived strength of tie.	Not supported
RQ1. For job seekers, how does perceived expertise of job information sources relate to perceived strength of tie?	No relationship
RQ2. For job seekers, how does perceived influence of job information sources relate to perceived strength of tie?	Negatively related
H2. For job seekers, perceived source status is inversely related to perceived strength of tie.	Not supported
H3. Among job seekers, tie strength has a curvilinear relationship with access to job information sources such that both strong and weak ties are more accessible than moderate ties.	Not supported, linear
H4. For job seekers, perceptions of social support from job information sources are positively related with perceived strength of tie.	Supported
H5. For job seekers, perception of received social support is negatively related with their unemployment duration.	Not supported
Network Motivations	
H6. Job seekers' perceived network size is negatively associated with their unemployment duration.	Not supported
H7. Job seekers perceive that the most connected paths between them and job information are online resources.	Not supported
Within Job Seeker Motivations	
H8. Controlling for perceived network size, the extent of exploratory nature of a job search is positively associated with the average strength of ties used.	See Figure 8
H9. Controlling for perceived network size, the extent of exploitative nature of a job search is negatively associated with the average strength of ties used.	See Figure 8
H10. Controlling for network size, uncertainty discrepancy is related with higher average ties strength during the job search.	See Figure 8
H11. Controlling for network size, uncertainty discrepancy is (a) positively related to exploratory job search processes and (b) negatively related to exploitative job search processes.	See Figure 8
H12. Controlling for network size, uncertainty discrepancy partially moderates the relationship between task-familiarity and use of ties such that uncertainty discrepancy leads to increased average tie strength.	See Figure 8

Study 2: Discussion

Study 2 collected data from individuals who had changed jobs, changed positions, or left a job in the past two years. Results showed participants used a wide variety of sources of varying strengths (see Table 8 and Table 15). The focus of this study was on attributes participants perceived about each source used, network motivations, and within job seeker contingencies. Therefore, this discussion will briefly overview findings related to source attributes, network attributes, and job seekers' perceptions of the task.

As detailed in the introductory chapter, SWT predicts that as more complex communication media allow for the maintenance of more connections at a lower cost, the benefits of seeking information through weak connections increases (Contractor & Eisenberg, 1990; Granovetter, 1983; Haythornthwaite, 2002). Like a close person-to-person relationship, websites are often (if not always) available. For example, when a romantic partner says call me whenever you need me, there are few exceptions to this availability. Websites, like strong ties, are available whenever the information seeker needs contact. Hence, whether they are close friends and family or websites, strong ties offer greater availability. The combined dimensions of frequency of interaction and closeness seemed to account adequately for strength of tie. This also implies that the Internet afford job seekers the ability to turn latent connections into a meaningful tie.

In this study of job seekers, the complex media (i.e., information available on websites) are doing more than that. As shown in the last *post hoc* test, these media allow network actors to parlay a latent tie of a website into a strong tie quickly and efficiently through increased interaction during a job search. Further, 24/7 job information online

allows job seekers to access job applications and information through direct online application, bolstering weak tie availability. Thus, the first implication is that situated tie interactions recast weak and latent ties into stronger ties as part of the task, in this case, job search.

The second implication comes from the SWT prediction that weak ties are beneficial because of their ability to offer high quality information efficiently; in contrast, strong ties are hypothesized to be beneficial because of their ability to influence others (Granovetter, 1973[1995]; 1983). Synthesizing findings to support SWT, Granovetter (1983) claims there exists a "division of labor between weak and strong ties: Weak ties provide the bridges over which innovations cross the boundaries of social groups; the decision making, however, is influenced mainly by the strong-ties network in each group" (p. 218). The findings about source attributes show that job seekers do not see job information sources in SWT terms. Specifically, results show a positive bias toward one's strong ties during the job search. The literature suggests those we interact with frequently and are close to are considered trustworthy, committed, obligated, and motivated to help (Lin, 2001). In this data, those to whom we are close were also considered more similar (i.e., homophily) with us, more supportive, as easier to access, and as bridges or liaisons to otherwise inaccessible information.

However, contrary to SWT predictions, source influence was negatively related to strength of tie. This is why the current study used a research question to ask about source influence. This study's findings are in line with recent qualitative evidence from Smith (2012) and Marin (2012) showing that weak ties are more likely to influence. Like these qualitative studies, weak ties were considered by job seekers to be more

influential than stronger ties. This contribution adds to the empirical evidence linking weak social connections to influence in the job search process, contrary to Granovetter's theorizing. This finding might be attributed to measurement; the scale asked how influential a source was, not whether they would use influence on the part of a job seeker. Certainly, ability to influence and willingness to influence are different constructs (Montoya & Horton, 2013). Future research should focus on the differences between sources that are able and willing to influence.

The non-significant findings for information quality and expertise were surprising given the emphasis on weak ties' ability to transmit high quality information in SWT. However, these non-significant findings could be attributed the increased use of online resources by all job seekers. Past research suggests that human sources are superior information providers than are databases or repositories (e.g., Levin & Cross, 2004; Su & Contractor, 2011). However, recent evidence suggests that review information found online was more influential in decision-making than was advice from a close friend received face-to-face (Steffes & Burgee, 2009). Further, competing evidence has shown that information quality is similar between known and unknown others via organizational intranet (Constant, Sproull, and Kiesler, 1996; Kankanhalli, Tan, & Wei, 2005). The findings of this study question the SWT assumptions that information is an attribute of weak ties and influence of strong ties. In the job search context, these results show the increasing importance of online information in information-seeking processes, in general. Websites and other online sources are no better or worse than human sources at providing high quality information and expertise.

Overall, strength of tie (as an amalgam of closeness and frequency of interaction) was a proxy for traits that should aid in obtaining job search information. These tie traits explain between 8% and 12% of the variance in strength of ties. SWT research would benefit from acknowledging that job seekers do not see the job search process in SWT terms. In other words, while job seekers do see ties as strong, moderate, and weak, they do not see the benefits of their job information sources as predicted by SWT (e.g., Friedkin, 1983). This makes sense because network actors are not well-equipped to see the benefits and pitfalls that a network can offer. At best, a person can see one or two steps away from the self in the network (Bruggeman, 2016). It seems that job seekers disproportionally rely on their strong ties. This strong tie bias may be a cause or a consequence of which job search sources to contact. Perhaps job seekers rely on strong ties because we can access them easily and there are few costs, especially when it comes to websites. If ease of access is the mechanism, because it costs less to interact frequently than it does to build close relationships, this may explain why online sources are becoming increasingly important sources of job information.

In sum, in this study, strong ties were perceived as more similar (i.e., homophily), better bridges to novel information, support providers, and easier to access. Weak ties were seen as more influential. One piece of information not investigated in the hypotheses that could inform these findings is the self-reported "most important" source during the job search. Table 15, below, provides a summary of the sources participants reported most important. Many participants, 44.6% (N = 127), reported websites were the most important; the next highest category was applying directly to a company online (13.3%, N = 38). In fact, the combined amount for all social sources

online and offline was not as high as that for websites (21.4%, *N* = 61). This table reinforces the claims above. Websites are becoming an increasingly important source of job information: both through direct online application and visiting webpages.

Table 15

Self-Reported "Most Important" Sources in Study 2

Source	Overall Use Frequency	Most Important Frequency
A website	91.6% (261)	44.6% (127)
Applying directly **online**	71.9% (205)	13.3% (38)
A job board or email list	36.5% (104)	10.9% (31)
An acquaintance or professional contact, **in person**	43.5% (124)	8.4% (24)
A close friend or family member, contacted **in person**	46.3% (132)	7.0% (20)
Applying directly **in person**	42.8% (122)	6.3% (18)
An acquaintance or professional contact, **online**	47.7% (136)	4.2% (12)
An employment agency	22.8% (65)	2.5% (7)
A close friend or family member, contacted **online**	41.4% (118)	1.8% (5)
Other source	5.3% (15)	1.1% (3)
Career Fair or Expo	15.8% (45)	0.0% (0)

Note: The words "in person" and "online" were bolded in the survey to highlight these differences to participants. Numbers in parenthesis are *N* of participants reporting each source.

Participants reported the specific websites they visited, and most responses were "traditional" job search sites: Indeed.com was named 81 times; Monster.com, 33 times; and Craigslist, 25 times. Other websites included job databases like government jobs sites (16 times), and not so common sources like, Reddit (3 times), Facebook (3 times), and Instagram (1 time). As a category, websites seem important in the job search process—at least in terms of job seekers' perceptions. Overall, 91.6% of the sample used websites. There is no doubt that SWT theory needs to be realigned to account for the modern job search sources given this finding about frequent use of websites as job information sources. Despite the prevalence of websites, as mentioned above, estimates suggest that approximately half of jobs are never posted publicly (Dill, 2014). That means that over half of jobs are not posted on websites or in print ads; instead, these jobs are spread via social networks (whether face-to-face or online).

Either the numbers of times strong and weak social connections are used are underestimated by job seekers, in this population, or the estimates of social source dissemination of jobs are mistaken. However, some estimates of the number of jobs not posted are even higher. Guffey and Lowey (2015) advise business students that as many as 50-80% of jobs are not posted publicly. The authors go as far as to advise, "More jobs are found through referrals and person-to-person contacts than through any other method. That's because people trust what they know" (p. 549). The results presented here, and in the first study, contradict the social assumptions of this SWT-driven advice. Today, the most important source of job information was the use of websites. Both websites, in general, and direct-online application, specifically, were rated as more important than other methods. Though conventional and anecdotal evidence reinforce

the SWT, empirical evidence (including these findings) suggest that weak ties are perceived less important than are strong ties for every benefit (support, ease of access, and bridging) of job information except influence (Lin et al., 2014). This may be because ties that are important during the job search are utilized more and perceived as closer as a result of this information-seeking process.

In summary the results show that there is a disconnect between job seekers perceptions of job information sources and job search tactics prescribed by theory. Additional examination and reconciliation of online job search may be warranted. The situated evidence from this study shows that traditionally weak or latent sources, like a webpage, can be considered strong ties during an information-seeking task like job search. However, it is unlikely that websites remain strong ties long term unless the site is very frequently used (e.g., Google.com). Additional clarification of the temporal components of tie strength is needed. Like a long-lost cousin, an information rich web-environment (e.g., craigslist.com) could be useful in obtaining job information. The move from latent ties to active ties (both strong and weak) demands additional specification. A longitudinal study of job search processes or other information-seeking task in which ties are made stronger or weaker based on task is needed. Future research should examine how, if, and under what conditions changes in tie strength are either temporary or lasting.

Though SWT and SHT do not directly address unemployment duration, subsequent research has demonstrated that social means of job attainment tend to correlate with reduced unemployment duration (Marsden & Campbell, 2001). Further, recent evidence (Kuhn & Mansour, 2014) suggests that the use of the Internet during

job searches was associated with reduced unemployment duration. Regressions predicting unemployment duration in this study showed no relationships to perceived network size or average social support received. However, unemployment duration was negatively related to self-reported social status. Overall, the network variables in this study were not predictive of unemployment duration, calling into question the utility of SWT and SHT beyond theory to aid in job attainment. Perhaps unemployment happens at such a macro or societal level that only more complete datasets can fully explore this relationship. Alternatively, strength of ties used may not be meaningfully associated with unemployment duration.

Perhaps the disconnect between the implicit assumption that "it's not what you know but who you know," and the reality that job seekers believe their strong ties are valuable sources of job information is highlighted best by the non-significant findings regarding network traits. First of all, the new bridging scale was not significantly related to any category of tie. However, *post hoc* analysis revealed a significant relationship between tie strength and bridging such that job seekers rate their strong ties as connecting them to unique information they could not otherwise access, a finding inconsistent with SWT. Contrary to the networked probabilities of SWT, job seekers view strong ties as more capable of connecting them to unique information. Again, the mathematical reality is that weak ties are much more likely to connect a job seeker with unique information (Burt, 2005); however, job seekers suffer from the same positive perceptual bias as all network actors (Casciaro, Carley, & Krackhardt, 1999). Indeed, liking is an influential source of power. McPherson et al. (2001) claim that "similarity breeds connection" (p. 415) and homophily was significantly related to tie strength.

However, the inverse may also be true: connection breeds similarity—and other positive traits. With the exception of influence, job seekers attribute positive traits to strong ties. However, it is worth noting that there was no difference across tie strength for ratings of information quality or expertise. This may signal that job seekers recognize a diverse network is necessary for successful job attainment.

The final set of hypotheses proposed a within job seeker contingency model. Specifically, hypotheses proposed a structural relationship between task-familiarity, uncertainty, and tie strength. Unfortunately, the first surprise in these findings was that the exploration and exploitation dimensions were not as conceptually sound as they were rhetorically. A revisit of the literature revealed some evidence for this; Popadiuk (2012) classified organizations as explorers, exploiters, or ambidextrous along six dimensions: organizational knowledge practices, innovative practices, competition, strategic orientation, organizational efficiency, and partnerships. Though Hills et al. (2015) contend that exploratory and exploitative modes of information search are "ubiquitous propert[ies] of life," these two types of search are still ambiguous across domains (p. 1). Certainly, when it comes to job searches, a two-dimensional view of exploitation and exploration provides an incomplete view of task-familiarity. Ultimately, a 5-item measure dealing with the use of a broad set of network contacts was retained. This scale, labeled as task-familiarity in the analysis, could just as well be labeled as network importance. Those with high scores on the scale saw networking during the job search as important while those with low scores did not value networking as much.

With this in mind, the results (displayed in Figure 8) show that those with a larger network tend to see the job search process as requiring a complex social network; the inverse was that those with smaller networks experienced greater uncertainty. Those individuals who view job search as a network task relied on stronger ties during their job search. This suggests the networked reality does not match the description provided by SWT, SHT, and social capital. In all, it seems that those who consider the job search as a network problem tend to use stronger ties, while those who experience higher uncertainty discrepancy use weaker ties on average.

One explanation for the positive relationship between task-familiarity and average strength of tie is that job seekers who recognize the importance of networks likely increase the frequency of interaction with and closeness to sources that help in job attainment. The situated measure of tie-strength may reveal that strength of ties is a moving target dependent on task. When it comes to job searches, a beneficial tie seems to be a tie which the job seeker contacts frequently. It is possible these findings are based on the exigencies of the job search more than they are on the long-term relational patterns that job seekers have with sources of information. Some of this variation is likely attributable to the increased interaction with sources who are beneficial during job search.

An alternative explanation might focus uncertainty discrepancy. When job seekers are uncertain, above their comfort level, they might be turning to weaker ties since they are already aware of what their strong ties can offer. The partially mediating role of uncertainty discrepancy between task-familiarity and average strength of tie may suggest that when job seekers do not find what they need from strong ties, they feel

uncertain. When they feel that their strong ties are not enough, they may be turning to weaker ties to uncover information not known by their immediate contacts. Thus, the finding that uncertainty discrepancy leads to the use of weaker ties on average may support SWT. If weak ties are capable of providing novel information, because such information cannot be found in strong ties, then it makes sense that a job seeker would turn to these ties. In all, this within job seeker model accounts for about 11% of the variance in the tie-strength of those consulted during the job search.

Only 36 participants (12.6%) rated a weak social connection (either in-person or online) as the most important source of job information. Meanwhile, websites were considered the most important source across all job seekers (see Table 15). It seems weak ties are no longer the most important source to turn to during a job search depending on whether websites are considered strong ties during the job search, or weak ties outside of the job search. Instead, the various forms of strong ties, and especially websites, are considered the best route to find a job. It remains unclear whether these sources are used because they are strong ties or these sources are strong because they are beneficial during the job search. If job seekers are rational, it makes sense that relationships with both human and non-human sources escalate as a result of the benefits the source is capable of providing during the task. The always available connections afforded by round-the-clock Internet access to both websites and human connections allows a savvy job seeker to increase both synchronous and asynchronous communication with little energy and effort.

Regardless of the causal direction, the second meaningful predictor was the level of uncertainty job seekers experienced above their uncertainty comfort level (i.e.,

uncertainty discrepancy). Those who experienced increased uncertainty about the job search tended to turn to weaker ties, including formal sources and weak social connections for job information. Perhaps those who are particularly uncertain and unfamiliar with network processes of job search are unable to parlay their weak and latent social connections into strong connections. Because of the positive relationship between task-familiarity and uncertainty discrepancy, it is unclear whether these individuals are unwilling or unable to turn weak and latent connections into strong ties. Additional research on strength of weak ties should examine task perceptions as a meaningful indicator of network actions. Though this seems quite intuitive given the numerous models of self-efficacy (e.g., Bandura, 2001) and internal motivation (e.g., Ryan & Deci, 2006), networks theory often neglects individuals' perceptual processes.

Study 2: Strengths and Limitations

There are benefits and drawbacks to using participants who reported changing jobs or positions in the last two years. Though these participants have certainly engaged in a job search, participants who were looking for a job but had not changed jobs, changed positions, or left a job were excluded. However, this also means all participants reported on an actual job search, not a hypothetical search process. Regarding the sample, using MTurk workers can provide high-quality responses that are better than other types of convenience samples (like students or workers from a single organization/industry), but they are also, by definition, more connected online than the average American. Perhaps the proclivity of MTurk workers to use the Internet plays a role in the importance of websites (and other online sources tended to be rated as "most important") in these findings. Regardless, these findings did come from a diverse group

of Americans who generally provided reliable survey responses, adding to the validity of the study.

Certainly, the responses represent a positive bias toward beneficial source attributes. Support, ease of access, and bridging ability that are helpful during a job search were all associated with stronger ties. High quality information and expertise ought to also be helpful during the job search but were unrelated to tie strength when tested with these other positive attributes. However, questions about the negative or harmful attributes of a source may have produced a more comprehensive view of the job search sources. For example, knowing which sources are unreliable and which sources are wastes of time may have yielded more guidance regarding efficiency of job source use during the job search.

The data collected here involved participant responses about 1,296 sources of job information. On average, job seekers reported using 4.60 sources. These many data points can be difficult to manage and interpret. A sample of one source per participant was used to test relationships between tie strength and tie attributes. A different method might be used such as a generalized linear mixed model to analyze the data; however, such a model was beyond the scope of this study. Therefore, the analyses reported here represents only two of several potential approaches to explore these hypotheses. The analysis presented here are straightforward and conservative approach with a focus on tie-attributes and tie-strength; a more complicated model could conceal or reveal additional variation in sources and their attributes.

Finally, the task-familiarity scales adopted, tested, and adapted did not provide the data necessary to answer the contingency hypotheses well. However, these data are

helpful to understanding how conceptualization of the job search process as a network-laden task affects job search. In all, the cognitive and source attributes cannot be ignored by network research. Ego-motivations are an important source of decision, choice, and action in the network of a job seeker and of an information seeker in general. As detailed in the final discussion chapter below, future research can benefit from emphasizing the perceptual and cognitive processes that factor into network decisions.

Study 2: Conclusion

The counterintuitive wisdom of SWT is that weak social connections are particularly helpful in providing information to jobs seekers because of their network positions (Granovetter, 1974). The findings of Study 2 demonstrate that job seekers perceive benefits for both strong and weak ties and disproportionally rate stronger ties as the most important sources of job information. In this sample of American's who have sought jobs in the past two years, "stronger ties," in terms of frequency of interaction and closeness, were associated with more positive attributes overall. These findings highlight the implications of increased access to job search sources (both human and nonhuman) via the Internet. Regressions comparing strong and weak ties show that weaker ties are seen as more influential while strong ties (including websites) are considered to provide greater social support, bridging, are easier to access, and are seen as more similar to the job seeker (i.e., homophily). Whether stronger ties are used as a result of preexisting relationships or due to increased interaction and closeness during the job search remains unclear. Contrary to hypotheses, this study did not find reduced unemployment duration as a result of perceive support or network size.

Job seekers' perceptions of the task mattered during job search as well. Results from a structural model show that job seekers with larger networks tend to view the job search as a network task (i.e., task-familiarity) and, in turn, use stronger ties on average. In contrast, job seekers with smaller networks tend to have increased uncertainty discrepancy and, in turn, use weaker ties. The relationship between task-familiarity and average tie strength was partially mediated by uncertainty discrepancy such that increased task-familiarity led to increased uncertainty discrepancy which was associated with use of weaker ties on average. These findings suggest that within job seeker perceptions of the task affect the sources used during the job search.

In all, the results of Study 2 suggest that tie strength is related to tie attributes. Further, tie use is related task perceptions and may explain the actions of actors who cannot see their entire network structure. Specifically, ties seem to be quickly and easily appropriated based on the task. These results call for additional investigation and extension of existing theory (i.e., SWT, SHT) about job search. Using these findings and those from Study 1, Chapter 5 presents an overall discussion and update to SWT theory in light of the use of Internet during the job search.

Chapter 5: Strength of Weak Ties in the Digital Age

Corman and Scott (1994) contend that "the network is an abstract structure of perceived communication relationships that function as a set of rules and resources that actors draw upon in accomplishing communication behavior" (p. 181). The two studies reported here verify this claim through empirical examinations of the social networks used by job seekers. Study 1 explores a network of networks, demonstrating that job seekers differentiate between types of sources. Specifically, the concurrence of social ties (including close friends and family, personal, and professional acquaintances), formal sources (employment agencies, job events, and printed ads), and online sources (social networking sites and job information and resources accessed online) occurs at a rate greater than chance. Study 2 shows that online and offline connections build a complex network of job information sources that range from weak to strong ties. Interestingly, weak ties include sources like direct in-person application, direct online application, and career events. In contrast, acquaintances contacted both online and in person were rated as more moderate ties than these formal sources. Strong ties included close friends and family contacted in person and online sources as well as websites. For these job seekers, websites served as relatively strong ties while direct online application served as the weakest tie reported. Across both studies, information obtained online was rated as the most important source of job information. Tie strength correlated with various source attributes (influence, support, ease of access, bridging, and homophily) that should be useful during job search and was related to job seekers' perceptions of the job search task. This chapter synthesizes these findings and discusses their theoretical and practical implications.

The studies presented here have implications for several domains. These studies paint a complicated picture supporting and challenging strength of weak ties (SWT) theory. Specifically, these findings suggest that the modern job search alters the premises accepted by most SWT research. The following pages detail implications of research findings in three major areas: (a) the social and material similarities and differences between human and non-human information sources are discussed, (b) the situated use of ties is explored using the lens of latent tie theory, (c) the implications for social network analysis are detailed at multiple levels. Throughout this discussion, directions for future research are provided. The chapter ends with a brief conclusion to the dissertation.

Sociomaterial Mangle of Practice

The social and technological sources of job information are intertwined, in line with the concept of sociomateriality. *Sociomateriality* is the ontological argument that social actors and material actors are empirically indistinguishable in the social environment. The concept of sociomateriality (Orlikowski, 2007; Orlikowski & Scott, 2008) suggests a mangle of practice or a constitutive entanglement between the social (i.e., human agency) and the material (e.g., technology, nonhuman sources of information). Orlikowski and Scott (2008) propose this mangle of practice to highlight a mutually constitutive position of both technology and social sources during interaction. Certainly, there is some evidence supporting sociomateriality in extant research (for a discussion, see Leonardi, 2012); however, this naturalistic job search data provides additional support for this claim.

Study 1 explored the actual job information sources used by a random sample of American job seekers. Results from Study 1 showed that formal sources, online sources, and social sources were conceptually distinct in terms of use. This evidence provides mixed support for sociomaterialty. Both social and technological sources were undoubtedly included in the network of job seekers; however, human sources and nonhuman sources were conceptually distinct in correspondence analysis. These data suggest that, although American job seekers turn to technological sources during the job search, they can and do distinguish between social, technological, and formal sources of job information.

This finding adds to past research which has often found that humans turn to human sources for knowledge. Levin and Cross (2004) summarize this trend well:

> Work dating to Pelz and Andrews (1966), Mintzberg (1973), and Allen (1977) indicates that people prefer to turn to other people rather than documents for information. For example, Allen (1977) found that engineers and scientists were roughly five times more likely to turn to a person for information than to an impersonal source such as a database or file cabinet. More recently, this same tendency has been found even for people with ready access to the Internet and their firm's extensive intranet (Cross & Sproull, 2004). In general, researchers have found relationships to be important to acquiring information (Burt, 1992), learning to do one's work (Lave & Wenger, 1991), and solving complex problems (Hutchins, 1991). (pp. 1477-1478).

However, the findings of both studies also contradict the conclusions reached by Levin and Cross (2004) more than a decade ago. In 2017, job seekers seem to turn disproportionately to technological sources for job information. In fact, online information and resources were marked by their centrality in the network of job seekers. Study 2, which explored perceptions of tie attributes as they relate to tie strength, provides considerable support for the sociomaterial perspective. Strength of tie varied

substantially between technological sources (i.e., websites versus direct online application), but did not vary among social and technological sources. At the point where technological sources are used in "lieu of people," the study of both technological and human actors may be warranted (Contractor et al., 2011, p. 683). This study provides substantial evidence for the sociomaterial relationship and suggests that strength of tie may have meaning in bounded contexts, like a job search, involving both human and technological actors.

Adding to the isomorphism of social and technical actors, regression results remained significant between tie strength and homophily, ease of access, social support, and influence, both with and without online-only sources (i.e., websites and direct online application). The only relationship that became nonsignifcant without online-only sources was bridging. In other words, the social and technical sources called on during a job search were analytically indistinct, as predicted by sociomateriality. The effects for bridging suggest that job seekers perceive that online sources offer information that would be inaccessible otherwise. The boundaries of space and time that may have limited job search in the past (e.g., getting the right newspaper classified ads at the right time) are reduced by instant and ubiquitous access to job information online. One caveat is warranted to this conclusion: *post hoc* analysis revealed that websites were strong ties because of the frequency of interaction, while strong human ties were strong because of emotional closeness. The combination of these findings suggests that, while job seekers see differences in sources (Pentland & Feldman, 2008), they use the network of job information sources on the basis of commensurate source attributes, regardless of social/technical differences. It appears job seekers are as likely to turn to

online postings, like Craigslist.com or Indeed.com, as they are to ask those whom they interact with face-to-face. Thus, sociomateriality is generally supported by these findings.

In all, the argument that humans and technology are easy to distinguish may hold true in some contexts but not in others (for a discussion, see Pentland & Feldman, 2008). For example, consider how important a cell-phone is to the average American. Those who consider cell-phones a third-limb or extension of the self (see Edley & Houston, 2011) would likely rate the device as completely overlapping with the self (7 on the Inclusion of Other in the Self scale). This example can be applied to well-worn websites. For instance, many people turn to Google.com for information on virtually any topic (in fact, in Study 2 one job seeker responded about Google.com). For individuals who rely heavily on one website that site is likely both a strong and persistent tie. However, the persistence of ties is a reasonable consideration for the sociomaterial perspective, as it is for any network study, a point explored further below. Thus, research on sociomateriality would do well to consider for what duration and under what conditions the social and material components of a network overlap. Certainly, both social and material actors' network presence is fluid across contexts and social or material sources are likely privileged in one context or another.

In line with Web 2.0, or social web adoption, the Internet is facilitating greater levels of interaction than ever (Walther & Jang, 2012). The findings of these studies support the argument that sociomateriality is an effective theoretical lens for studying how technology continues to become embedded in everyday interactions (Edley & Houston, 2011). Walther (2009) suggests computer-mediated theorists are obligated to

theorize not at the current capabilities of technology, but at the potential for online interaction in current and emerging media. For instance, interactive technological assistants (e.g., Google Assistant, Amazon's Alexa, and Apple's Siri) may soon be conducting web searches on behalf of job seekers. Further, the complex algorithms behind social websites already lead to targeted ads and emails for anyone who searches online. Although the data reported here suggest that job seekers think of online sources of information as separate from social sources (Study 1), both online and social sources coexist on a continuum of tie strength and source attributes. Certainly more interactive and ubiquitous technological sources (including assistant software) are likely to forge stronger and more meaningful ties with all social actors who use technology.

Complex databases for connecting and retrieving information from unknown others, are now ubiquitous. These websites link information seekers to disparate others and serve as vital sources of information. Thus, it makes sense to include "technology in the network" (Contractor et al., p. 683). This association is likely true for other network tasks as well, including sending and receiving support, gathering information, and solving problems. Future research should consider whether source type/category of source or tie strength serves as a better predictor for both source attributes and source utilization. When technological sources are considered along with traditional and human information sources, it is clear that ties of varying strengths can be more than just social connections. These findings suggest that who or what researchers and social actors consider a tie needs to be reevaluated. Further, the findings detailed here suggest that tie strength is, at a minimum, a meaningful indicator of other network qualities (i.e., perceived ease of access, bridging, support, influence, and homophily).

Latent Tie Theory and the Strength of Weak Ties

The always-available communication channels afforded by the Internet are changing the availability of social connections and technical sources of information. Despite evidence suggesting that a person's social network size remains the same, in spite of social websites (i.e., Dunbar, 2015), this study highlights how multiple job information sources can be accessed "cheaply and easily" across great distance at any time (Ellison, Steinfeld, & Lampe, 2007, p. 1146). As Constant, Sproull, and Kiesler (1996) observed: "Computer networks can link people, in the absence of acquaintances, physical proximity, group membership, a history of prior relationships, and demographic similarity" (pp. 119-120). The evidence provided by these findings suggests that individuals who use new communication media are capable of quickly shifting the composition of their social network. While past theory has focused on peripheral shifts (i.e., latent to weak ties), the evidence presented in the current studies suggests that the always-on connections may facilitate more situated and, at times, dramatic shifts in tie strength (i.e., no tie to strong tie) to meet task demands. This finding is important because support of latent tie use is sparse. For instance, Utz (2015) found no information benefits based on latent ties and concluded that additional research is needed to demonstrate the role of ties. Job seekers appear to quickly move social and non-human sources from no tie or latent tie to both weak (i.e., direct online application) and strong ties (i.e., job information websites) through cognitive and affective means (i.e., perceptions of closeness; Smith, 2012) as well as behavioral means of increased interaction.

Study 1 demonstrated increases in overall use of online resources and information during the job search. Further, Pew Internet and American Life data show increases in use of online information sources by Americans from year to year (Smith, 2015). In Study 1, social networking sites were also a common source of job information. While online sources, social sources, and formal sources were all used in meaningful patterns together, the data suggest that job seekers rely on a particular type of source for job information. Extending these findings, Study 2 highlights the perceptual processes underlying source utilization. Participants in this study classified websites as strong ties, a finding primarily driven by frequency of interaction with these always-on sources of job information. In contrast, direct online application, the other online-only source, represented the weakest tie (in terms of frequency and closeness) on average. These contrasting online sources suggest that job seekers can appropriate sources from latent connections to weak or even strong ties. However, job search websites like Indeed.com, Monster.com and even Craigslist.com may represent a new form of tie: an easily accessible bridging tie.

Though the examples above focus on online interaction, there is reason to believe that social ties function in a similar manner. *Post hoc* tests showed no differences in tie strength between online and in-person interaction with either close ties or acquaintances. It is likely that job seekers become closer to and interact more frequently with *any* source that can be accessed during a job search; indeed, ease of access was consistently related to strength of tie. It may be that sources that are seen as possessing more positive traits (with the exception of influence) are called upon and become stronger. It could also be that sources are used because they possess these traits

before the job seeker begins the search. For example, if a job seeker knows a Facebook friend has helpful information regarding a job search, that job seeker likely turns to that source via messages, posts, or any other means of connection available. Examination of media multiplexity (i.e., multiple ties across multiple types of networks) between a job seeker and information source in the future is warranted.

Future research must disentangle the causal mechanism leading to use of a source during the job search. Given that perceived homophily is positively related to tie strength, it is likely that positive attributes are ascribed to sources a job seeker decided to use rather than vice-versa (a self-serving bias, e.g. Shepperd, Malone, & Sweeny, 2008), but this claim requires substantiation. Additional longitudinal evidence of the escalation and de-escalation of tie strength within situated interaction (e.g., job searching, information seeking, learning, and problem solving) is needed to clarify whether positive attributes are the cause of connection or connection is the cause of positive attributes. Two recent developments in network theory help explain this relational escalation with ties: (a) social capital exchange online and (b) the bandwidth-diversity tradeoff theory.

Social capital and the Internet. As detailed in the literature review above, the research on social capital and online sites has yielded mixed findings. For instance, Vitak (2014) found that, on social networking sites, the distinction between instrumental, social, and emotional support is unclear. Further, studies demonstrate that both strong and weak ties accessed online provide support. Perhaps this is why Liu, Ainsworth, and Baumeister's (2016) meta-analysis (published after this dissertation's data collection began) shows robust effects for both bridging and bonding social capital

on social networking sites. Utz and Muscanell (2015) conclude that "the classical assumptions from social capital theory do not hold any more on social media" (p. 421). The evidence suggests that social networking sites allow users to obtain support from both strong and weak ties. In these studies, though social support was correlated with tie strength, nonhuman information sources (i.e., websites) were among the strongest ties. The studies detailed in this dissertation add to the mounting evidence that attributes of face-to-face relationships like social, emotional, and instrumental support do not map well onto the changing landscape of interaction via the Internet.

These findings offer some explanation why social capital measurements vary with social website usage: Job seekers, and those who tap their social network using always-on media, are able to quickly and easily move ties from latent to weak, strong, or moderate ties. In conjunction with the increased trust placed in information posted by unknown others online (e.g., Jensen, Averbeck, Zhang, & Wright, 2014; Lim & Van Der Heide, 2015), the current studies suggests that tie strength morphs during online interaction. These findings may shed some light on the meta-analytic findings of Liu et al. (2016). Instant access also allows for instant reclassification of relationship based on the information or support-seeker's needs. While persistent, strong (or even moderate) ties may not change rapidly, increased interaction available across all types of ties via the Internet does allow for fluidity of tie classification.

Diversity-Bandwidth Trade-off. The second explanation for the tie re-appropriation comes from Aral and Van Alsyne's (2011) diversity-bandwidth trade-off theory. These authors claim that strength of tie is less important than overall ability of one's social network to carry information of varying complexity. Specifically, the

theory argues that humans have finite resources available to maintain social connections and an optimal network is the network capable of carrying whatever information is needed. As Aral (2016) claims, "high bandwidth ties are maintained with high-value information sources, while lower bandwidth ties are maintained with lower-value information sources" (p. 1933). Additionally, the theory contends that, because of the finite ability to maintain relationships, there is a tradeoff between maintaining high-bandwidth strong connections and low-bandwidth weak ties such that strong ties, which provide greater information carrying capacity, are costly to maintain. In all, more diverse information comes at the costs of lower bandwidth and higher bandwidth reduces network diversity.

The structural model in Study 2 introduces new evidence into this diversity-bandwidth tradeoff theory—when job seekers see the job search as a network-driven phenomena, they turn to stronger rather than weaker ties. Contrary to the theory's prediction that social connections represent a finite set of resources in which network actors trade bandwidth (i.e., strong connections) for diversity (i.e., weak connections), this study suggests that job seekers who believe the job search is about tapping a broad network of contacts actually turn to strong ties, or perhaps turn their weak ties into strong ties. This finding does not deny that bandwidth is a finite resource, but does extend the theory to suggest the tradeoffs with bandwidth and diversity may be more rapid or in-the-moment. In line with the theory, when job seekers experienced greater uncertainty discrepancy, they reached out to weaker ties on average. Restated in bandwidth-diversity terms, when job seekers needed a greater diversity of information (because of uncertainty), they tended to use weaker connections.

This evidence reinforces Bruggeman's (2016) recent extension of diversity-bandwidth theory that suggests *bandwidth matching* occurs when information sources are called upon to meet information needs. This study presents the first empirical evidence supporting bandwidth matching. In the case of job seekers, weaker ties are believed to reduce uncertainty discrepancy while stronger ties are perceived as capable of facilitating network connection. Again, these claims are contingent of the causal process affecting perceptions of ties. On one hand, connection may breed positive perception. On the other hand, positive perception may lead to changes in connection. Either way, these findings go against the mathematical probability that weak ties *should* offer more and unique information while strong ties provide more complex information and influence. Instead, results show the network of a job seeker may be a dynamic environment in which skilled job seekers call upon the best suited sources and make them into strong ties. Future research should look for bandwidth matching in situated contexts like searching for a job. Those helping job seekers should encourage them to explore their network as much as possible while exploiting the best available resources of job information by turning those sources into strong ties.

Finally, the tie escalation and de-escalation proposed here suggest a distinction between long-term ties and short-term ties, extending diversity-bandwidth trade-off theory as well as SWT. Such a distinction has been hinted at in the literature; Marsden and Campbell (2012) suggest that the long-term emotional involvement may be important to tie strength as "features such as frequency and closeness accumulate rather than substitute for one another" (p. 19). Thus, commitment, investment, satisfaction, and quality of alternatives may be useful in distinguishing between human and non-

human sources of interaction (e.g., Rusbult & Farrell, 1983). Future research should measure situated (e.g., closeness, frequency of interaction) and long-term (e.g., commitment, investment) variables as indicators of tie strength.

Implications for Network Theory

The last sets of implications derived from these studies are applicable to network theory and network analysis. In line with recent social capital research on social networking sites, the approach taken in both studies is focused on job seekers' perceptions of source attributes and their own job search experiences. Therefore, claims about network compositions from these studies are only possible from the ego's perspective (for a discussion, see Krämer, Rösner, Eimler, Winter, & Neubaum, 2014). However, job seekers' perceptions are tied to source use and tie strength and, thus, matter to the job search. The following paragraphs detail the assumptions of motivation in network research, propose a multilevel approach to network analysis, and review the implications for strength of weak ties research.

Contractor et al. (2006) remind network researchers that network analysis is a focus on relations and "actors may be any kind of meaningful social unit, including individuals, collective entities, firms, organizations, and divisions within organizations, as well as nonhuman agents, such as knowledge repositories" (p. 682). Their multi-theoretical multilevel (MTML) approach to organizational interaction also emphasizes the importance of distinguishing cognitive, behavioral, and network-level phenomena. In the case of this dissertation, the Study 1 represents a network-of-networks approach with results speaking to types of ties used during the job search. Contractor et al. (2006)

call this a global-level of network interaction. Study 2 focuses on cognitive and perceptual processes related to network use—a micro-level or perceptual approach.

Typically, sociologists examine SWT research with a keen eye on the network of actors, focusing on the structural benefits afforded by weak ties (Burt, 1992). However, some research suggests that the benefits of weak ties are not evident to network actors (Lin, 2001). Friedkin's (1983) study of the network of professors in two institutions showed actors are only effective at seeing about 30% of network information at one-step away and know less than 10% of information at two-steps or more. In other words, network actors are not particularly effective at seeing the composition of their own networks and are likely unaware of the structural advantage afforded to them.

This dissertation highlights the complexities associated with information seeking via social networks during the job search. Specifically, these studies show that the communicative reality (the person-to-person or person-to-information source communication) that job seekers engage in does not seem to fit the SWT theory's description of the sociological reality. Job seekers no longer, and perhaps never did, perceive weak social connections as the primary or "most important" source of job information. Instead, technological repositories and latent ties turned into strong ties (e.g., Craigslist.com, Monster.com, Indeed.com) are the preferred source to use when seeking job information. Not only do job seekers prefer these sources, they also report online sources as the most important source of job information (at a rate higher than all person-to-person sources combined). The assumptions of SWT theory are not consciously realized by (or perhaps known to) the job seekers looking for work.

Burt (2000) contends that, "[T]he network is its own explanation of motive" (p. 36). Burt (2005) later softens his position, acknowledging the importance of an actor's entrepreneurial attitude in network utilization. The findings of this dissertation extend the perceptual grounds for network action much further and call into question network-as-motivation assumption. In Study 2, the first antecedent endogenous variable was network size. Though perceived network size had a significant indirect effect on average strength of tie, contrary to SWT, the effect of networks size was positively related to average strength of tie used. In other words, actors who perceived larger networks often reached out to stronger ties. Further, the structural model showed that perceptions of the task as a network problem and level of uncertainty discrepancy were predictive of strength of tie used. The evidence is clear: While perceived network is one motive, it is not the only (or even primary) motive effecting network utilization.

In sum, network researchers should heed Shumate and Contractor's (2014) call for the analysis of network phenomena at multiple levels with available explanatory mechanisms. Beyond Shumate and Contractor's call, future research should also acknowledge that network parameters like density, tie strength, and transitivity alone cannot account for actor motivations during a task performance. Instead, network research should assume a psychodynamic approach whereby psychological factors are considered both the cause and consequence of social interactions (e.g., Brown & Starkey, 2000). A similar argument can be made for the interplay between dyad interaction and triad interaction, as well as from triad interaction to larger group interaction. Though many network scholars have emphasized the varying levels of network interaction (e.g., actor, dyad, triad, global; Contractor et al. 2006), few studies

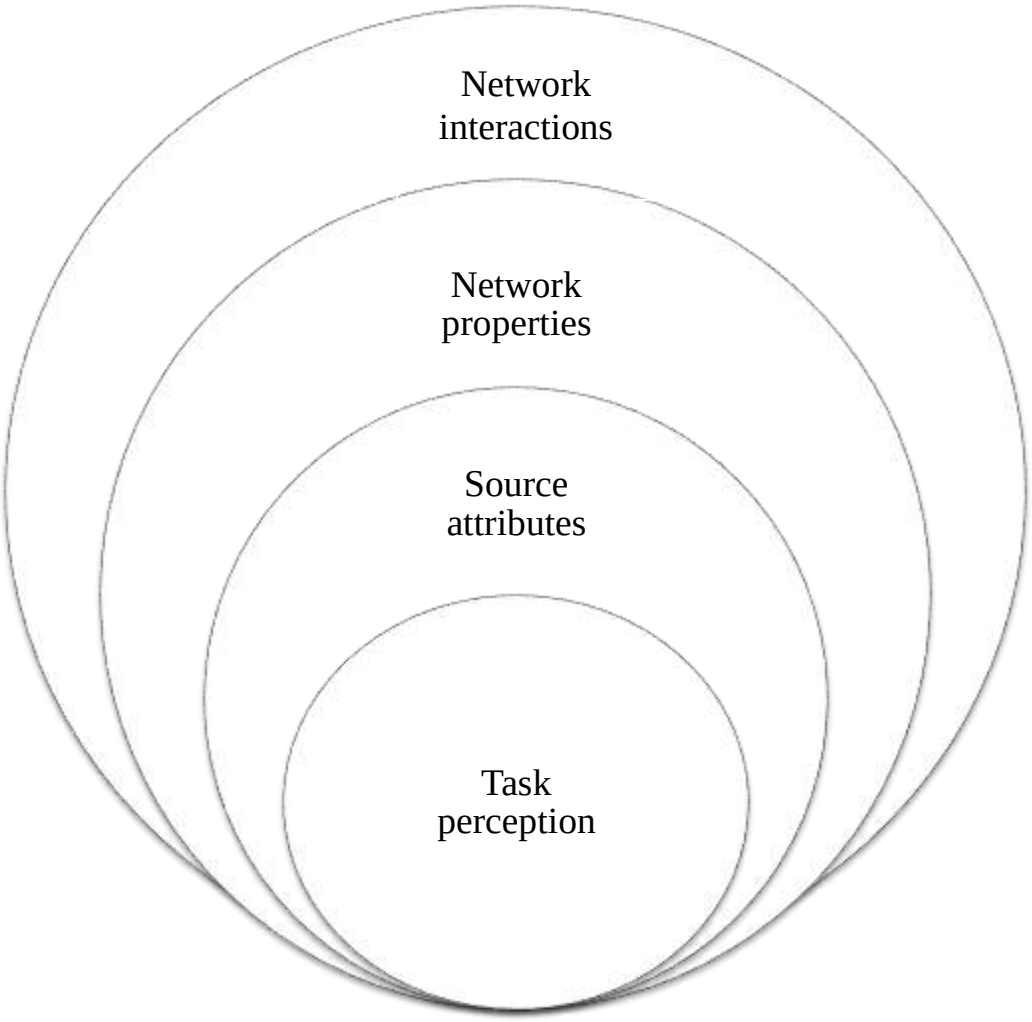
have emphasized the micro-level cognitive processes that affect decision, choice, and action by network actors. The findings of Study 2 show that perception of the task, the source, and the network all affect the network resources both as perceived and as used by network actors. Adding in cognitive and perceptual variables offers additional explanatory power to studies concerned with network formation and utilization.

It appears that moderation and differentiation across various levels of the network is key to understanding job seeker motivations as they relate to both perceptions and network use. Lin (2001) provides a synopsis of the dichotomy in social capital research. Some theories like SWT and SHT favor network probabilities to account for actor decision, choice, and agency. Other theories of social capital may favor agency at the cost of structural advantage. The studies in this dissertation seem to indicate multiple levels of influence on tie use. Participants in this study reported their perceptions and their action to provide evidence about that structure of interaction with job information sources (Study 1) and the motivation for source use (Study 2). However, these data neglect a birds-eye, macro view of a whole network dynamic (Burt [2005] might call these competitive advantages). Instead, these data answer what sources job seekers turn to and why.

Taken together, these findings suggest that levels of measurement in network research is a nested problem. Specifically, various attributes within job seekers, between sources, within network, and between the numerous networks in which actors are embedded work in concert to determine network action. Each level from cognitive to societal can affect decisions made by a network actor. While these studies were unable to measure the full-network (an impossible task given the nearly infinite number of

sources available to any job seeker), they do show that meaningful variance is explained by job seekers' perceptions of the self, the task, and the sources. Research also shows that actors' positions in network structure afford clear benefits to actors (Burt, 2005). The model laid out in Figure 9 depicts one way to map the multiple levels of network influence.

Figure 9
Nested Levels of Network Influence



The model proposed here, shown in Figure 9, emphasizes to network researchers that network use is fundamentally a communication problem. The question of who says what to whom when and with what effect (Lasswell, 1948) can only be answered when the complex psycho- and socio-dynamics of communication are considered. Within communicator attributes (like task-familiarity and uncertainty), perceived source attributes (like supportiveness, ability to influence, ease of access), and perceptions of the network space (like network size, bridging ability) all partially determine which sources are contacted. However, the network itself also serves as a motivational force in which savvy or entrepreneurial network actors take advantage of the competitive advantages they can afford (for details, see Burt, 2005). Further, as Contractor et al. (2011) clearly demonstrate, multiple networks (e.g., advice giving, advice seeking, friendship) also overlap to determine who is called upon and under what circumstances.

Consider the example of a job seeker who is both uncertain and who thinks of the job seeking process as an information (as opposed to network) process. These findings suggest that this individual will likely apply directly to jobs (i.e., use weak ties) and hope to gain employment. It does not matter if this job seeker is in an advantageous structural position (e.g., the job seeker's close friends know people who could hire the job seeker) if the job seeker does not actually use the network advantage. As Obukhova and Lin (2013) explained, having network resources is not the same as using network resources. Marsden and Campbell (2012) are even more direct: "Put simply, that a tie has the capacity to convey resources or information of value does not assure that it will transmit them" (p. 20). Those teaching, coaching, and engaging in job search should acknowledge how easy it can be to ignore some resources at the expense of others (e.g.

focus on formal sources at the expense of technical sources). Effective job seekers use their network, in both social and technical form, to their benefit during job search.

A comprehensive multilevel approach to network analysis can account for the numerous network and cognitive influences in networked action. A multilevel approach acknowledges that multiple nodes with multiple relations are part of the complex social environment. Taking a multilevel approach avoids "a significant oversimplification of the rich complexity that exists in most social networks" (Contractor et al., 2011, p. 686). Though researchers like Obhukhova and Lin (2005) and Marsden and Campbell (2001) prescribe varied motivations, few network studies have examined cognitive motivations. Future research must address the levels of motivation (e.g., communicator and source attributes, and network perception) affecting network action detailed above.

Contractor, Whitbred, Fonti, and Steglich (2012) contend that "we need studies that: (a) incorporate multiple theories that influence the evolution of emergent communication networks, (b) incorporate multiple levels of analysis, and (c) utilize analytic strategies that allow examination of the relative influences of the theoretical mechanisms over time" (p. 336). This so-called multi-theoretical multilevel (MTML) approach has been adopted in several studies (e.g., Contractor et al., 2006; Contractor et al., 2011). In general these studies have neglected any perceptual measures in favor of ego-attributes (e.g., age, gender, education). The findings of this dissertation suggest levels of analysis previously not identified: (a) between network (network interactions), (b) within network (network properties), (c) between sources (source attributes), and (d) within ego (task perception) all matter in complex information exchange tasks such as job searches. Focusing only on one type or level of analysis conceals rich data that can

be described through more comprehensive examinations (Contractor et al., 2011). Despite the argument for MTML approaches, actor-perception and cognition are often excluded in favor of network level information. Including technology and perception (i.e., accounting for multiple levels of motivation) in the networks of job seekers provides greater explanatory power of both network composition and utilization.

Strength of Weak Ties. Though theory and experiment are capable of demonstrating optimal network models, there are still many unanswered questions about how naturally occurring networks operate (Aral, 2016). The studies detailed in this dissertation examine the naturally occurring networks of job seekers in order to provide evidence that links theory and action during job searches. Specifically, this research explains what perceptions of source and actor motivations drive tie usage. This evidence speaks to the whole-network and ego-network divide in strength of weak tie (SWT) research (Aral, 2016; Burt, 1992). Although Americans' social networks may be relatively stable in terms of social ties (as detailed in Chapter 1), the sources of information used by American job seekers have undergone a dramatic shift, at least in terms of job search. Now, more than ever, information sources accessed online are the primary source of job information. As speculated above, this shift may be because complex communication media allow for the escalation of interaction with little effort.

Obukhova and Lin (2013) and Yakubovich (2005) both described numerous anecdotes across cultures, essentially implying "it's not what you know; it's who you know;" (e.g., the Russian saying "It is better to have 100 friends than 100 rubles"; Bian [1997] writes about the *guanxi* [literally relation or relationship] networks in China). However, *having* resources in one's social network is not the same as *using* one's social

resources. There is no denying the role of weak ties in successful information diffusion. For instance, large-scale social networking site data (e.g., Bakshy, Marlow, Rosenn, & Adamic, 2012; Grabowicz, Ramasco, Moro, Pujol & Eguiluz, 2012) and a national sample of call logs (Onella et al., 2007) both demonstrate that weak ties connect otherwise disconnected groups and individuals. The wisdom of the available network does not necessarily translate to the actions of a network actor.

These findings suggest that the benefits previously attributed to both strong (i.e., complex information transfer) and weak ties (i.e., novel information transfer) are important to job seekers (Granovetter, 1983; 1995). More specifically, it appears that tie strength is fluid in relation to an actor's perception of the ability of a job information source to meet their needs. Burt's (1992) insight that "tie strength is a correlate, not a cause" (p. 27) is essential to interpreting the results of these studies. What does this mean for SWT? Initially, it indicates that the job search situation dictates the appropriate tie utilization.

The idea that ties are appropriated to the situation is informed by research about the online environment in general. If ties are quickly escalated from latent to weak ties or even strong ties, Walther's (1996) hyperpersonal perspective may help explain the mechanism at work. The hyperpersonal perspective contends that impression formation online leads to emotionally intense relationships because of selective self-presentation online and selective attribution on the part of the receiver. Regarding perceiver effects, Walther (2011) contends:

> When receiving messages from others in CMC, an individual may tend to exaggerate perceptions of the message sender. In the absence of the physical and other cues that face-to-face encounters provide, rather than fail to form an impression, receivers fill in the blanks with regard to missing information. This often takes the form of idealization if the initial clues about another person are favorable. (p. 460)

Though website tie strength was driven by interaction frequency, interaction with social connections likely follows Walther's (2011) claim. Restated in terms of a job seeking situation, connecting with a weak connection or a latent tie may prompt intense relational development (at least in terms of frequency of interaction and closeness) as a function of medium used. Perhaps those strong ties are the result of relational escalation that is exacerbated by contact via computer-mediated communication (i.e., hyperpersonal communication). In Study 2, those who saw the job search as a network-laden process were likely to utilize strong ties; in part, because these individual's turned websites into strong ties through increased interaction. Future research must examine the cognitive, affective, and behavioral processes that lead to increased strength of ties. Granovetter's (1973) complex definition of tie strength as an amalgam of emotional intensity, time spent together, mutual confiding, and reciprocity may need to be revisited to tease out the complexities between an *in situ* strong tie and lasting strong relationship. Likely, situated ties are less emotionally intense and equipped for reciprocating than are the ties that span space and time.

Structural holes and tie utilization. Bruggeman (2016) reminds network scholars that, "the value of a structural hole is reduced by the number of nodes that have access to it" (p. 1923). Given the bridging function of websites, the value of structural holes that are used extensively should be questioned. Restated with the present findings, the Internet connects many dissimilar others to job information; however, because it is

capable of facilitating so many connections, the value of searching for jobs via the Internet may be minimized. This is a catch-22 whereby job who do not use the vast pool of information available online are at a competitive disadvantage. At the same time, while posting information online can give organizations greater exposure and leads to a greater diversity of candidates, it also increases competition and dilutes the search pool for job seekers. In Bruggeman's words, "it seems very unlikely that actors having their strongest ties to sources that provide irrelevant or false information would outperform those using their strongest ties to acquire valuable information instead" (p. 1926). Here Bruggeman suggests that savvy network actors are capable of turning the most valuable information sources into strong ties. The notion that network actors can exploit the value of structural holes, despite prevalence of use by other network actors, is supported by the findings reported in Study 2. Savvy job seekers can identify quality information sources and modify tie strengths with beneficial (and useless) sources to their benefit.

Perhaps the network truism that structural holes lose value as more actors use them no longer holds when the threshold of information transmission (i.e., bandwidth and diversity of information) is increased dramatically by vast online databases. For example, if one wants to know what it is like to work at the University of Oklahoma, at the time this was written, there are over 400 reviews on Glassdoor.com; for students, there are more than 2,500 reviews on Niche.com. The point here is that the Internet is offering an expansive amount of information about employers, job opportunities, and many other areas in which a person might seek information. Job seekers see it this way as well; recall that *post hoc* comparisons removing online-only sources caused the relationships between tie-strength and bridging to become non-significant. Future

research must investigate the new form of bridging provided by complex media that allow strangers with unknown motives to aid our decision making (Jensen et al. 2013). The mass availability of detailed insider information is particularly relevant in the face of the potential to alter the definition of a bridge.

Practical application of SWT. Those who know the benefits of SWT tend to view the theory as a truism. Recall that Mark Granovetter has been called the James Dean of sociological research (Glass, 2016). While the SWT theory did represent a major breakthrough for sociology, the strength of strong and moderate ties (providing support, influence, or other valuable benefits) cannot be ignored (Granovetter, 1983; 1995). Further, the ability of network actors to quickly escalate a relationship from weak to strong calls into question the original premise. Should educators and job search consultants continue to tell students and job seekers to comb the periphery of their social network, asking everyone they encounter, "Do you know of any jobs that fit my abilities?" As an example, Guffey and Lowey (2014), in their popular business communication text, advise students to ask a dentist or neighbor about prospective job opportunities. However, the evidence presented in this dissertation may change these practices, given that the norms and roles of an offline society differ from Internet interactions. When every potential information source is just a click away, it is appropriate, perhaps even beneficial, to seek job information as often as possible. In other words, a job seeker can connect synchronously or asynchronously with both human and non-human communication partners to find the best available job information.

Of course, those advising job seekers should also recognize that networked actors cannot see their own networks well. As Friedkin (1983) demonstrates, network actors see about one-third of relationships one-step away and less than 10% of relationships at two-steps away. In sum, humans are not always effective at identifying their own structural advantages or disadvantages. Thus, students ought to be advised that the network has benefits awaiting those who take initiative (Burt, 2005). Additionally, because of the support available online, perhaps mentors should advise students that the job search is a intensive process and that, while discouraged job seekers without support struggle (i.e., Feuls et al., 2016; Fiesler et al., 2014), those who can turn their weak and distant connection into valuable resources likely succeed in the job finding process. Communication with known and unknown others (both human and nonhuman) is essential for an effective job search. The advice to comb the periphery of one's social network remains the same; however, an addendum that leveraging online networks is essential to job search success is required. These findings, of course, transcend the job search context, the sociomaterial and latent tie implications suggest the need for situated, or task-specific, investigations of the role of tie strength.

Conclusion

The two studies presented here explore how American job seekers use their networks. The findings offer implications for sociomateriality, latent tie theory, and network research in general. Study 1 demonstrated that various types of sources are used together at a rate greater than chance. Job seekers turn to social sources, online sources, and formal sources during the job search. Job seekers tend to use the same types of sources together—suggesting there may be different types of job seekers. Study

2 explored job seeker perceptions of sources, their own network, and the job search task to reveal the relationships between tie strength and source attributes.

Together these studies show that technology can be considered "inside" the network of job seekers, and suggest that it is time to reconsider the role of technology in other types of networks. The social and material dichotomy has less meaning when technological sources are considered close and are always available for access. Further, the always-on Internet facilitates ties of all types and allows a network actor increase tie strength with little energy and effort. Together, these studies emphasize the importance of examining network perceptions not just the structural (dis)advantages associated with network position. The main premise of SWT that weak ties are more numerous and span across different social circles than one's strong ties is brought into question by these situated findings. It appears that job seekers turn latent and no-tie connections into both weak and strong ties to successfully engage in job search. Taken together, these findings suggest that future research examining the longitudinal escalation and de-escalation of ties based on task needs is warranted.

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Appendix A: Detailed Measures

Sense of Power Scale (website example)

Please indicate your level of agreement with the following statements. (1 = *strongly agree*, 7 = *strongly disagree)*

1) I think the people on glassdoor.com have a great deal of power over a hiring organization.
2) The people on glassdoor.com can get an employer to do what they desire.
3) The people on glassdoor.com have little sway with an employer.
4) The people on glassdoor.com ideas and opinions are often ignored by an employer.
5) If the people on glassdoor.com want to, they get to make the decisions about hiring.
6) The people on glassdoor.com can get an employer to listen to what they say.

Original Bridging Scale (newspaper example)

Instructions: Please rate your agreement with the following. (1 = *strongly disagree*, 7 = *strongly agree*)

1) The Norman Transcript is capable of connecting me with information I could not otherwise access.
2) The Norman Transcript serves as an intermediary between myself and the jobs I sought.
3) The Norman Transcript serves as a bridge between myself and employers
4) The Norman Transcript is capable of connecting me with others who have valuable information about the job I sought.
5) The Norman Transcript is connected to others who I could not access otherwise.

Updated Bridging Scale (newspaper example)

Instructions: Please rate your agreement with the following. (1 = *strongly disagree*, 7 = *strongly agree*)

1) The Norman Transcript is capable of connecting me with information I could not otherwise access.
2) The Norman Transcript serves as an intermediary between myself and the jobs I sought.
3) The Norman Transcript is not able to connect me with potential employers.
4) The Norman Transcript is not capable of connecting me with others who have valuable information about the job I sought.
5) The Norman Transcript is connected to others who I could not access otherwise.

Uncertainty Discrepancy

*Instructions: These questions are regarding your feelings during your last/current job search. (*1 = *strongly disagree,* 7 = *strongly agree)*

1) I wanted to know more than I did about the job finding process.
2) I know less than I'd like to about how to best find a job.
3) I wish I knew more about how to find jobs effectively.
4) I am happy with the amount I know about finding a job.
5) I am confident I know what I need to know about the job finding process.

Text and Body Work Scale

Instructions: Regarding your current/most recent job. Please rate your agreement with the following statements. (1 = *strongly disagree,* 7 = *strongly agree)*

1) I primarily use my hands/body to do my job.
2) I primarily use texts (i.e., words, books, e-mails, etc.) in my line of work.
3) I spend a large portion of my day doing tasks that require physical labor.
4) I spend most of my day sitting at a desk.
5) My work is physically challenging.
6) My job could be considered a "white collar" job.
7) My job could be considered a "blue collar" job.

Updated Exploitation/Exploration Scale Items

1. I searched for new and different job opportunities. (R)
2. I looked at diverse job opportunities. (R)
3. I focused on trying new job search skills. (R)
4. I was very adaptable when searching for job opportunities. (R)
5. I attempted to learn new skills or knowledge to find job opportunities. (R)
6. I mainly relied on past experience to leverage job opportunities. (T)
7. I relied on existing relationships for job opportunities. (T)
8. I engaged in job search activities in which it was clear how to proceed. (T)
9. I focused mainly on short-term goals when finding a job. (T)
10. I had the knowledge necessary to search for jobs effectively at the time. (T)
11. I relied on my existing knowledge of job information sources to find job opportunities. (T)
12. I relied on my close friends and family members to help me find a job. (R)
13. I called on a diverse group of people to help me find a job. (T)
14. I view the job search process as a competition to be won. (T)
15. I view the job search process as a chance to learn something new. (R)
16. The job search process is about creating new connections with people I don't know well. (T)
17. The job search process is about fostering existing relationships with people I am close to. (R)
18. The job search requires me to use technical knowledge that is not easily understood. (R)
19. The job search requires me to use intuition. (T)
20. The job search requires me to focus on networking. (T)
21. The job search requires me to be innovative. (R)
22. The job search requires me to be efficient. (T)
23. The job search requires me to take risks. (R)

Note: T = exploitation, R = exploration

Updated Task-Familiarity Scale Items and Loadings

	Task-familiarity, $\alpha = .87$
7. I relied on existing relationships for job opportunities.	**.785**
12. I relied on my close friends and family members to help me find a job.	**.797**
13. I called on a diverse group of people to help me find a job.	**.839**
17. The job search process is about fostering existing relationships with people I am close to.	**.815**
20. The job search requires me to focus on networking.	**.825**

Note: Factors are rotated using direct oblimin oblique rotation. The first 50 survey responses were used to conduct this analysis.

Principal Component Analysis on Information Quality and Source Expertise

	Expertise, α = .94	Information Quality, α = .84
Expertise 1: Intelligent/Unintelligent	**.896**	.011
Expertise 2: Trained/Untrained	**.904**	-.066
Expertise 3: Expert/Inexpert	**.834**	.027
Expertise 4: Informed/Uninformed	**.854**	.038
Expertise 5: Competent/Incompetent	**.861**	.064
Expertise 6: Bright/Stupid	**.902**	.005
Information Quality 1: Objective	.008	**.804**
Information Quality 2: Complete	.360	**.635**
Information Quality 3: Accurate	.325	**.668**
Information Quality 4: Relevant	.213	**.683**
Information Quality 5: Novel	-.142	**.647**

Note: Factors are rotated using direct oblimin oblique rotation. This analysis comes from the first randomly selected dataset.

Appendix B: Sample Survey

Q215.
Online Consent to Participate in Research

Would you like to be involved in research at the University of Oklahoma?
I am Cameron W. Piercy from the Department of Communication and I invite you to participate in my research project entitled Job search information sources. This research is being conducted on Qualtrics.com via OU's Norman Campus. You were selected as a possible participant because you accepted this HIT on Amazon, agreeing that you have sought a job in the past 2-years. You must be at least 18 years of age to participate in this study.

Please read this document and contact me to ask any questions that you may have BEFORE agreeing to take part in my research.

What is the purpose of this research? The purpose of this research is understand the sources people use during job search and why they use them.

How many participants will be in this research? About 500 people will take part in this research.

What will I be asked to do? If you agree to be in this research, you will be asked to answer a series of questions about your current or most recent job search. These questions will include both your perceptions of the sources you used and your feelings about the job search. You will also be asked about your current job.

How long will this take? Your participation will take between 30 minutes and 1 hour. Participants will be compensated based on the number of questions they are required to answer. Responses that are too fast or too slow (more than 3 times above or below the average) will not be awarded compensation. Responses that miss more than half of the directed response questions (e.g. please select "strongly agree") will not be awarded compensation.

What are the risks and/or benefits if I participate? There are no risks and no benefits from being in this research.

Will I be compensated for participating? You will be reimbursed for your time and participation in this research. Participants will receive $5.00 upon completion of the survey. Responses that are too fast or too slow (more than 3 times above or below the average) will not be awarded compensation. Responses that miss more than half of the directed response questions (e.g. please select "strongly agree") will not be awarded compensation. You may only take this survey one (1) time, duplicate participants will not be awarded compensation.

Who will see my information? In research reports, there will be no information that will make it possible to identify you. Research records will be stored securely and only approved researchers and the OU Institutional Review Board will have access to the records. In addition, this is an academic not-for-profit research project. Data are collected via mTurk (an online survey system) that has its own privacy and security policies for keeping your information confidential. Please note no assurance can be made as to the use of the data you provide for purposes other than this research.

Do I have to participate? No. If you do not participate, you will not be penalized or lose benefits or services unrelated to the research. If you decide to participate, you don't have to answer any question and can stop participating at any time.

Who do I contact with questions, concerns or complaints? If you have questions, concerns or complaints about the research or have experienced a research-related injury, contact me at
Cameron Piercy
580.713.6610
cpiercy@ou.edu
or my advisor
Sun Kyong Lee
sunklee@ou.edu
You can also contact the University of Oklahoma – Norman Campus Institutional Review Board (OU-NC IRB) at 405-325-8110 or irb@ou.edu if you have questions about your rights as a research participant, concerns, or complaints about the research and wish to talk to someone other than the researcher(s) or if you cannot reach the researcher(s).
Please print this document for your records. By providing information to the researcher(s), I am agreeing to participate in this research.

This research has been approved by the University of Oklahoma, Norman Campus IRB.
IRB Number: 7560 Approval date: 12/20/2016

(•) I agree to participate
( ) I do not want to participate

Q3. **In the past <u>two years</u> have you changed jobs, positions, or left a job?**

(•) Yes, changed jobs
( ) Yes, changed position
( ) Yes, left a job
( ) No

Q2. **Are you currently looking for a new job/position?**

Definitely yes	Probably yes	Might or might not	Probably not	Definitely not
( )	( )	(•)	( )	( )

Q4. **Do you have access to the Internet on a regular basis?**

(•) Yes
( ) No

Q6.
In which state do you currently reside?

New Jersey

Q149. Please enter the content shown in the picture below.



Privacy & Terms

Sources. **During your current or most recent job search, to what extent did you use each of the following sources?**
Please think of one person or website for each source you report using in this response, do not reuse the same source for multiple modes of communication.

	Did Not Use	Used Occasionally	Used Frequently
A close friend or family member contacted online	(•)	( )	( )
An acquaintance or professional contact online	(•)	( )	( )
A close friend or family member contacted in-person	( )	( )	(•)
An acquaintance or professional contact in-person	(•)	( )	( )
A website	( )	(•)	( )

Applied directly to a company in-person	◉	○	○
Applied directly to a company online	○	◉	○
A job/career fair	◉	○	○
A job board/email list service	◉	○	○
An employment agency (government or private)	◉	○	○
Please select did not use to show you read this	◉	○	○
Other (please specify)	◉	○	○

Q148. During your current/most recent job search, who or what was/has been the most important job information source?

- ○ A close friend or family member contacted online
- ○ An acquaintance or professional contact online
- ◉ A close friend or family member contacted in person
- ○ An acquaintance or professional contact in person
- ○ A website
- ○ Applied directly to a company in person
- ○ Applied directly to the company online
- ○ A job/career fair
- ○ A job board/email list service
- ○ An employment agency (government or private)
- ○ Other (please specify)

sonline. Please write the first name OR title (e.g. Jane, sister) of someone you are really close with (e.g. best friend, spouse, parent, child, etc.) who you contacted ONLINE for job information.

This question was not displayed to the respondent.

Q70. What media would you use to contact this person? (Check all that apply)

This question was not displayed to the respondent.

wonline. Please write the first name OR title (e.g. Justin, church member) of an acquaintance or professional contact who you contacted ONLINE for job information.

This question was not displayed to the respondent.

Q71. What media would you use to contact this person? (Check all that apply)

This question was not displayed to the respondent.

sinperson. Please write the first name OR title (e.g. Jane, sister) of someone you are really close with (e.g. best friend, spouse, parent, child, etc.) who you contacted IN-PERSON for job information.

Mom

winperson. Please write the first name OR title (e.g. Justin, church member) of an acquaintance or professional contact who you contacted IN-PERSON for job information.

This question was not displayed to the respondent.

webpage. **Please write the URL/name of the webpage you used to obtain job information.**

Monster.com

directinperson. Please write the name of the company you applied to directly to obtain job information.

This question was not displayed to the respondent.

directonline. **Please write the URL/name of the website you used to apply directly to the company online.**

http://careers.barnesandnoble.com/

careerfair. Please write the name of the job/career fair you used to obtain job information.

This question was not displayed to the respondent.

jobboard. Please write the name of the job board/email list service you used to obtain job information.

This question was not displayed to the respondent.

empagent. Please write the name of the employment agency you used to obtain job information.

This question was not displayed to the respondent.

c.sonline. Please select the picture that best describes your relationship with during your job search:

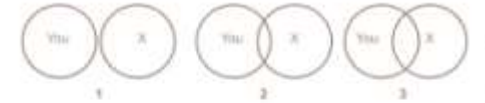


This question was not displayed to the respondent.

f.sonline. During your current or most recent job search, how frequently did/do you interact with

This question was not displayed to the respondent.

c.sonline. Please select the picture that best describes your relationship with during your job search:

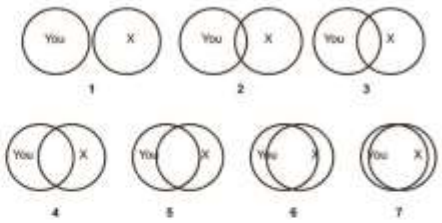


This question was not displayed to the respondent.

f.sonline. During your current or most recent job search, how frequently did/do you interact with

This question was not displayed to the respondent.

c.sinperson. **Please select the picture that best describes your relationship with Mom during your job search:**

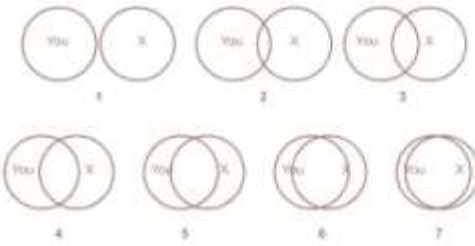


1 2 3 4 5 6 7

f.sinperson. **During your current or most recent job search, how frequently did/do you interact with Mom**

Never	About once a year	Several times a year	Every few months	Monthly	Weekly	Several times a week	Daily
○	○	○	○	○	○	○	◉

c.sinperson. **Please select the picture that best describes your relationship with during your job search:**

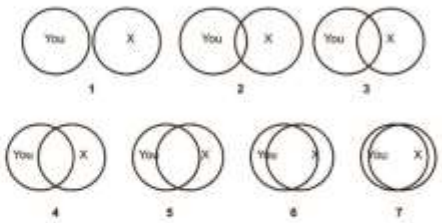


This question was not displayed to the respondent

f.sinperson. **During your current or most recent job search, how frequently did/do you interact with**

This question was not displayed to the respondent

***c.website.* Please select the picture that best describes your relationship with Monster.com during your job search:**

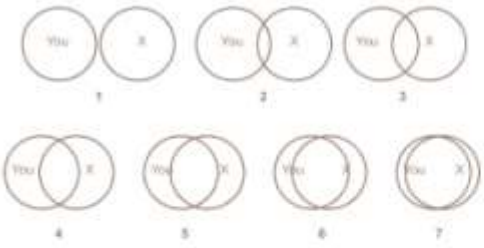


1 2 3 4 5 6 7

f.website. **During your current or most recent job search, how frequently did/do you interact with Monster.com**

Never	About once a year	Several times a year	Every few months	Monthly	Weekly	Several times a week	Daily
○	○	○	○	○	○	◉	○

c.directinperson Please select the picture that best describes your relationship with during your job search:

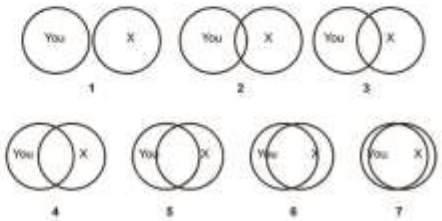


This question was not displayed to this respondent

f.directinperson During your current or most recent job search, how frequently did/do you interact with

This question was not displayed to this respondent

c.directonline. Please select the picture that best describes your relationship with http://careers.barnesandnoble.com/ during your job search:



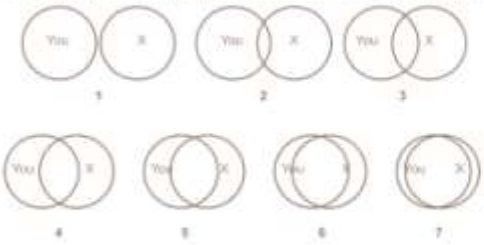
1 2 3 4 5 6 7

○ ◉ ○ ○ ○ ○ ○

f.directonline. During your current or most recent job search, how frequently did/do you interact with http://careers.barnesandnoble.com/

Never	About once a year	Several times a year	Every few months	Monthly	Weekly	Several times a week	Daily
○	◉	○	○	○	○	○	○

c.careerfair Please select the picture that best describes your relationship with during your job search:

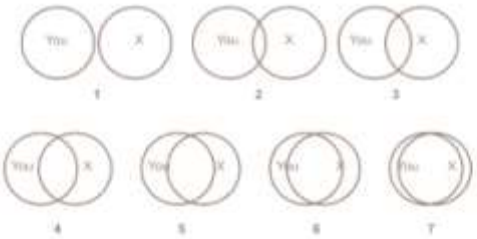


This question was not displayed to this respondent

f.careerfair During your current or most recent job search, how frequently did/do you interact with

This question was not displayed to this respondent

c.jobboard Please select the picture that best describes your relationship with during your job search:

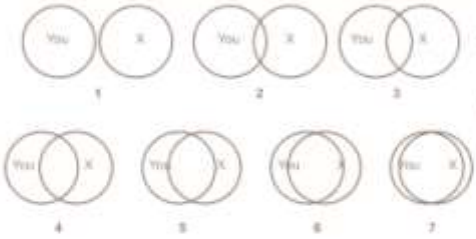


This question was not displayed to the respondent

f_jobboard: During your current or most recent job search, how frequently did/do you interact with

This question was not displayed to the respondent

c_empagency: Please select the picture that best describes your relationship with

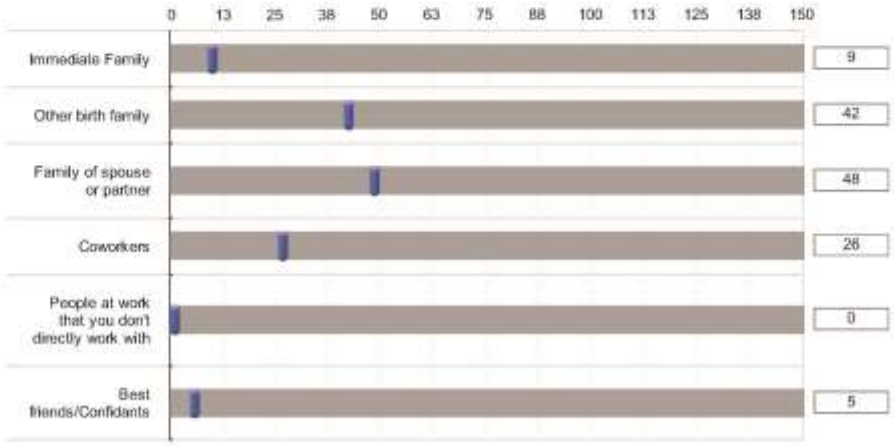


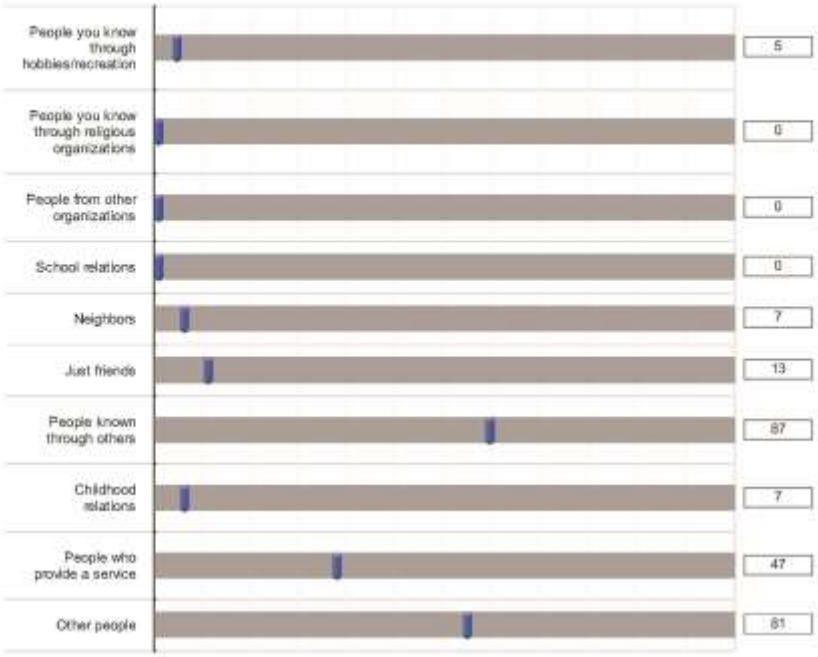
This question was not displayed to the respondent

f_empagency: During your current or most recent job search, how frequently did/do you interact with

This question was not displayed to the respondent

Net. **Please estimate the number of people you know in each of the following categories. To select 0 simply click on the slider.**





UN. **These questions are regarding your feelings during your last/current job search.**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I wanted to know more than I did about the job finding process.	○	◉	○	○	○	○	○
I knew less than I'd like to about how to best find a job.	○	◉	○	○	○	○	○
I wish I knew more about how to find jobs effectively.	○	○	○	○	◉	○	○
I am happy with the amount I knew about finding a job.	○	○	○	○	○	◉	○
I am confident I knew what I needed to know about the job finding process.	○	○	○	○	○	◉	○

EE. Please rate your agreement with these statements regarding your current or most recent job search:

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I searched for new and different job opportunities.	○	○	○	○	◉	○	○
I looked at diverse job opportunities.	○	◉	○	○	○	○	○

I focused on trying new job search skills.	○	○	◉	○	○	○	○
I was very adaptable when searching for job opportunities.	○	○	○	◉	○	○	○
I attempted to learn new skills or knowledge to find job opportunities.	○	○	◉	○	○	○	○
I mainly relied on past experience to leverage job opportunities.	○	○	◉	○	○	○	○
I relied on existing relationships for job opportunities.	○	○	○	○	○	◉	○
I engaged in job search activities in which it was clear how to proceed.	○	○	○	◉	○	○	○
I focused mainly on short-term goals when finding a job.	○	○	○	○	◉	○	○
I had the knowledge necessary to search for jobs effectively at the time.	○	○	○	○	○	◉	○
I relied on my existing knowledge of job information sources to find job opportunities.	○	○	○	○	◉	○	○
I request that you respond disagree to this question to show you read it.	○	◉	○	○	○	○	○

EEN. Please rate your agreement with these statements regarding your current or most recent job search:

	Strongly Disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I relied on my close friends and family members to help me find a job.	○	○	○	○	○	◉	○
I called on a diverse group of people to help me find a job.	○	○	◉	○	○	○	○
I view the job search process as a competition to be won.	○	○	○	◉	○	○	○
I view the job search process as a chance to learn something new.	○	◉	○	○	○	○	○
The job search process is about creating new connections with people I don't know well.	○	○	○	◉	○	○	○
The job search process is about fostering existing relationships with people I am close to.	○	○	○	○	◉	○	○
The job search requires me to use technical knowledge that is not easily understood.	○	◉	○	○	○	○	○
The job search requires me to use intuition.	○	○	○	◉	○	○	○
The job search requires me to focus on networking.	○	○	○	◉	○	○	○
The job search requires me to be innovative.	○	○	◉	○	○	○	○
The job search requires me to be efficient.	○	○	○	◉	○	○	○
The job search requires me to take risks.	○	○	◉	○	○	○	○

Q216. Please describe how easy or difficult your job search was/has been in a few sentences. Please explain what source has been most helpful and why in your answer.

My job search ended up being easier than I had initially assumed. I started out on job sites and searches posting my resume, but by mother learned of a position in her company that I was qualified for. She passed my name along to the hiring committee and I was contacted for an interview, and subsequently given the job. It was a quick process and I was working within the week.

EmpStatus. **Which statement best describes your current employment status?**

- (•) Working (paid employee)
- ( ) Working (self-employed)
- ( ) Not working (temporary layoff from a job)
- ( ) Not working (looking for work)
- ( ) Not working (retired)
- ( ) Not working (disabled)
- ( ) Not working (other) [ ]
- ( ) Prefer not to answer

TimeOnJob. **How long have you been at your current job?**

- (•) Less than 1 year
- ( ) 1-2 years
- ( ) 2-5 years
- ( ) 5+ years

UnempDur. **How long, if at all, were you/have you been unemployed prior to you current job?**

[30 or more months ▼]

Occup. **What is your current/most recent occupation?**

Data Entry

SS_Self. **Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job. Where would you place yourself on this ladder?**



10 9 8 7 6 5 4 3 2 1
( ) ( ) ( ) ( ) ( ) ( ) ( ) (•) ( ) ( )

ChangeOcc. **During your most recent job search did you try to change occupations?**

- (•) Yes
- ( ) No
- ( )

Unsure/Prefer not to answer

FathOcc. **What was your father's occupation? (If you don't know, please write "NA")**

Project supervisor

SS_Father. **Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job. Where would you place your father on this ladder?**



Not Applicable	10	9	8	7	6	5	4	3	2	1
○	○	○	○	◉	○	○	○	○	○	○

TextBody. **Regarding your current/most recent job. Please rate your agreement with the following statements.**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I primarily use my hands/body to do my job.	◉	○	○	○	○	○	○
I primarily use texts (i.e., words, books, e-mails, etc.) in my line of work.	○	○	○	○	○	◉	○
I spend a large portion of my day doing tasks that require physical labor.	◉	○	○	○	○	○	○
I spend most of my day sitting at a desk.	○	○	○	○	○	○	◉
Please select Agree to show that you read this question.	○	○	○	○	○	◉	○
My work is physically challenging.	◉	○	○	○	○	○	○
My job could be considered a "white collar" job.	○	○	○	○	○	○	◉
My job could be considered a "blue collar" job.	◉	○	○	○	○	○	○

SD_Expert. Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent.

SO_InfoQual Please indicated your level of agreement with the following statements:

provides information that is...

This question was not displayed to the respondent.

SO_Power Please indicated your level of agreement with the following statements:

This question was not displayed to the respondent.

SO_Homo
Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

:

This question was not displayed to the respondent.

SO_Stat Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off – those who have the least money, least education, and least respected jobs or no job.

Where would you place on this ladder?



This question was not displayed to the respondent.

SO_Ease1 Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.
In general, how often is this the case when obtaining job information from ?

This question was not displayed to the respondent.

SO_Ease2 How accessible or easy is it to get job information from ?

This question was not displayed to the respondent.

SO_Ease3 How difficult on average is it to get job information from ?

This question was not displayed to the respondent.

SO_Support Interactions with are:

This question was not displayed to the respondent.

SO_Bridge: **Please rate your agreement with the following.**

This question was not displayed to the respondent.

WO_Expert: Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent.

WO_InfoQual: Please indicated your level of agreement with the following statement:

provides information that is...

This question was not displayed to the respondent.

WO_Power: **Please indicated your level of agreement with the following statements:**

This question was not displayed to the respondent.

WO_Homo
Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

:

This question was not displayed to the respondent.

WO_Status: Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place on this ladder?



This question was not displayed to the respondent.

WO_Ease1: **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case when obtaining job information from ?

This question was not displayed to the respondent.

WO_Ease2: **How accessible or easy is it to get job information from ?**

This question was not displayed to the respondent

WO_Ease3 **How difficult on average is it to get job information from ?**

This question was not displayed to the respondent

WO_Support **Interactions with are:**

This question was not displayed to the respondent

WO_Bridge **Please rate your agreement with the following.**

This question was not displayed to the respondent

SIP_Exper. Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from Mom.

Intelligent	○ ◉ ○ ○ ○ ○ ○	Unintelligent
Untrained	○ ○ ○ ○ ○ ◉ ○	Trained
Inexpert	○ ○ ○ ○ ○ ◉ ○	Expert
Informed	○ ◉ ○ ○ ○ ○ ○	Uninformed
Incompetent	○ ○ ○ ○ ○ ○ ◉	Competent
Bright	○ ◉ ○ ○ ○ ○ ○	Stupid

SIP_InfoQual. Please indicated your level of agreement with the following statements:

Mom provides information that is..

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Objective	○	○	○	◉	○	○	○
Complete	○	○	○	○	○	○	◉
Accurate	○	○	○	○	○	○	◉
Relevant	○	○	○	○	○	○	◉
Novel	○	○	○	◉	○	○	○

SIP_Power. **Please indicated your level of agreement with the following statements:**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think Mom has a great deal of power over a hiring organization.	○	○	○	○	◉	○	○
Mom can get an employer to do what he or she desires.	○	○	○	○	○	◉	○
Mom has little sway with an employer.	○	◉	○	○	○	○	○
Mom's ideas and opinions are often ignored by an employer.	○	◉	○	○	○	○	○
If Mom wants to, she or he gets to make the decisions about hiring.	○	○	○	○	◉	○	○
Mom can get an employer to listen to what he or she says.	○	○	○	○	○	◉	○

SIP_Homo.
Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Mom :

Is like me	○ ◉ ○ ○ ○ ○ ○	Is unlike me
Is different from me	○ ○ ○ ○ ○ ◉ ○	Is similar to me
Has goals similar to mine	◉ ○ ○ ○ ○ ○ ○	Has goals different from mine

SIP_Status. Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place Mom on this ladder?



10 9 8 7 6 5 4 3 2 1
○ ○ ○ ◉ ○ ○ ○ ○ ○ ○

SIP_Ease1. **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case when obtaining job information from Mom?

Never	◉ ○ ○ ○ ○ ○ ○	Always

SIP_Ease2. **How accessible or easy is it to get job information from Mom?**

Very easy	◉ ○ ○ ○ ○ ○ ○	Not at all easy

SIP_Ease3. **How difficult on average is it to get job information from Mom?**

Very difficult	○ ○ ○ ○ ○ ○ ◉	Not at all difficult

SIP_Support. **Interactions with Mom are:**

Supportive	○ ◉ ○ ○ ○ ○ ○	Not Supportive
Positive	○ ◉ ○ ○ ○ ○ ○	Negative
Encouraging	○ ◉ ○ ○ ○ ○ ○	Not Encouraging

SIP_Bridge. **Please rate your agreement with the following.**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Mom is capable of connecting me with job information I could not otherwise access.	○	○	○	○	○	○	◉
Mom serves as an intermediary between myself and the jobs I sought.	○	○	○	○	○	◉	○
Mom is not able to connect me with potential employers.	◉	○	○	○	○	○	○
Mom is not capable of connecting me with others who have valuable information about the job I sought.	◉	○	○	○	○	○	○
Mom is connected to employers who I could not access otherwise.	○	○	○	○	○	○	◉

WIP_Expert Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent

WIP_InfoQual Please indicated your level of agreement with the following statement:

provides information that is...

This question was not displayed to the respondent

WIP_Power **Please indicated your level of agreement with the following statements:**

This question was not displayed to the respondent

WIP_Homo
Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers

:

This question was not displayed to the respondent

WIP_Status Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place on this ladder?



This question was not displayed to the respondent.

WP_Ease1 Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.
In general, how often is this the case when obtaining job information from ?

This question was not displayed to the respondent.

WP_Ease2 How accessible or easy is it to get job information from ?

This question was not displayed to the respondent.

WP_Ease3 How difficult on average is it to get job information from ?

This question was not displayed to the respondent.

WP_Support Interactions with are:

This question was not displayed to the respondent.

WP_Bridge Please rate your agreement with the following.

This question was not displayed to the respondent.

WEB_Expert. Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from Monster.com.

Intelligent	○ ◉ ○ ○ ○ ○ ○	Unintelligent
Untrained	○ ○ ○ ○ ◉ ○ ○	Trained
Inexpert	○ ○ ○ ○ ○ ◉ ○	Expert
Informed	◉ ○ ○ ○ ○ ○ ○	Uninformed
Incompetent	○ ○ ○ ○ ○ ◉ ○	Competent
Bright	○ ○ ◉ ○ ○ ○ ○	Stupid

WEB_InfoQual. Please indicated your level of agreement with the following statements:

Monster.com provides information that is...

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree

Objective	○	◉	○	○	○	○	○
Complete	○	○	◉	○	○	○	○
Accurate	○	○	○	○	○	○	◉
Relevant	○	○	○	○	○	○	◉
Novel	○	◉	○	○	○	○	○

WEB_Power. **Please indicated your level of agreement with the following statements:**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think the people at Monster.com have a great deal of power over a hiring organization.	◉	○	○	○	○	○	○
The people at Monster.com can get an employer to do what they desire.	◉	○	○	○	○	○	○
The people at Monster.com have little sway with an employer.	○	○	○	○	○	○	◉
The people at Monster.com ideas and opinions are often ignored by an employer.	○	○	○	○	○	○	◉
If the people at Monster.com want to, they get to make the decisions about hiring.	◉	○	○	○	○	○	○
The people at Monster.com can get an employer to listen to what they say.	◉	○	○	○	○	○	○

WEB_Homo.
Bubbles at the ends indicate very strong feelings bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Those who are part of Monster.com :

Are like me	○	○	◉	○	○	○	Are unlike me
Are different from me	○	○	○	○	◉	○	Are similar to me
Have goals similar to mine	○	○	◉	○	○	○	Have goals different from mine

WEB_Status. Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place those who are part of Monster.com on this ladder?



10	9	8	7	6	5	4	3	2	1
○	○	○	○	○	◉	○	○	○	○

WEB_Ease1. **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case with Monster.com?

Never	○ ○ ○ ◉ ○ ○ ○	Always

WEB_Ease2. **How accessible or easy was it to get job information from Monster.com?**

Very easy	◉ ○ ○ ○ ○ ○ ○	Not at all easy

WEB_Ease3. **How difficult on average is it to get job information from Monster.com?**

Very difficult	○ ○ ○ ○ ○ ○ ◉	Not at all difficult

WEB_Support. **Interactions with those who are part of Monster.com are:**

Supportive	○ ○ ◉ ○ ○ ○ ○	Not Supportive
Positive	○ ○ ◉ ○ ○ ○ ○	Negative
Encouraging	○ ○ ◉ ○ ○ ○ ○	Not Encouraging

WEB_Bridge. **Please rate your agreement with the following.**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Monster.com is capable of connecting me with job information I could not otherwise access.	○	○	○	○	○	◉	○
Monster.com serves as an intermediary between myself and the jobs I sought.	○	○	○	○	○	○	◉
Monster.com is not able to connect me with potential employers.	◉	○	○	○	○	○	○
Monster.com is not capable of connecting me with others who have valuable information about the job I sought.	○	◉	○	○	○	○	○
Monster.com is connected to employers who I could not access otherwise.	○	○	○	○	○	○	◉

JB_Expert. **Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.**

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent.

JB_InfoQual. **Please indicated your level of agreement with the following statements.**

provides information that is...

This question was not displayed to the respondent.

JB_Power. **Please indicated your level of agreement with the following statements:**

This question was not displayed to the respondent.

JB_Homo
Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Those who are part of :

This question was not displayed to the respondent.

JB_Status Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place those who are part of on this ladder?



This question was not displayed to the respondent.

JB_Ease1 **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case with ?

This question was not displayed to the respondent.

JB_Ease2 **How accessible or easy was it to get job information from ?**

This question was not displayed to the respondent.

JB_Ease3 **How difficult on average is it to get job information from ?**

This question was not displayed to the respondent.

JB_Support **Interactions with those who are part of are:**

This question was not displayed to the respondent.

JB_Bridge **Please rate your agreement with the following.**

This question was not displayed to the respondent.

EA_Expert Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent.

EA_InfoQual Please indicated your level of agreement with the following statements:

provides information that is...

This question was not displayed to the respondent.

EA_Power Please indicated your level of agreement with the following statements:

This question was not displayed to the respondent.

EA_Homo
Bubbles at the ends indicate very strong feelings bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Those who are part of :

This question was not displayed to the respondent.

EA_Status Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place those who are part of on this ladder?



This question was not displayed to the respondent.

EA_Ease1 Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.
In general, how often is this the case with ?

This question was not displayed to the respondent.

EA_Ease2 How accessible or easy was it to get job information from ?

This question was not displayed to the respondent.

EA_Ease3 How difficult on average is it to get job information from ?

This question was not displayed to the respondent.

EA_Support Interactions with those who are part of are:

This question was not displayed to the respondent

EA_Bridge Please rate your agreement with the following.

This question was not displayed to the respondent

CF_Expert Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent

CF_InfoQual Please indicated your level of agreement with the following statements

provides information that is...

This question was not displayed to the respondent

CF_Power **Please indicated your level of agreement with the following statements:**

This question was not displayed to the respondent

CF_Homo
Bubbles at the ends indicate very strong feelings bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Those who are part of :

This question was not displayed to the respondent

CF_Status Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place those who are part of on this ladder?



This question was not displayed to the respondent

CF_Ease1 **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case with ?

This question was not displayed to the respondent.

CF_Ease2. **How accessible or easy was it to get job information from ?**

This question was not displayed to the respondent.

CF_Ease3. **How difficult on average is it to get job information from ?**

This question was not displayed to the respondent.

CF_Support. **Interactions with those who are part of are:**

This question was not displayed to the respondent.

CF_Bridge. **Please rate your agreement with the following.**

This question was not displayed to the respondent.

DO_Expert. Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from http://careers.barnesandnoble.com/.

Intelligent	○ ○ ◉ ○ ○ ○ ○	Unintelligent
Untrained	○ ○ ○ ○ ◉ ○ ○	Trained
Inexpert	○ ○ ○ ○ ◉ ○ ○	Expert
Informed	○ ◉ ○ ○ ○ ○ ○	Uninformed
Incompetent	○ ○ ○ ○ ◉ ○ ○	Competent
Bright	○ ○ ◉ ○ ○ ○ ○	Stupid

DO_InfoQual. Please indicated your level of agreement with the following statements:

http://careers.barnesandnoble.com/ provides information that is...

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Objective	○	○	◉	○	○	○	○
Complete	○	○	○	○	○	◉	○
Accurate	○	○	○	○	○	◉	○
Relevant	○	○	○	○	○	◉	○
Novel	○	○	○	◉	○	○	○

DO_Power. **Please indicated your level of agreement with the following statements:**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I think the people at http://careers.barnesandnoble.com/ have a great deal of power over a hiring organization.	○	○	○	○	○	○	◉
The people at http://careers.barnesandnoble.com/ can get an employer to do what they desire.	○	○	○	○	◉	○	○

The people at http://careers.barnesandnoble.com/ have little sway with an employer.	◉	○	○	○	○	○	○
The people at http://careers.barnesandnoble.com/ ideas and opinions are often ignored by an employer.	○	◉	○	○	○	○	○
If the people at http://careers.barnesandnoble.com/ want to, they get to make the decisions about hiring.	○	○	○	○	◉	○	○
The people on http://careers.barnesandnoble.com/ can get an employer to listen to what they say.	○	○	○	○	○	◉	○

DO_Homo.
Bubbles at the ends indicate very strong feelings bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Those who are part of http://careers.barnesandnoble.com/ :

Are like me	○ ○ ○ ◉ ○ ○ ○	Are unlike me
Are different from me	○ ○ ○ ◉ ○ ○ ○	Are similar to me
Have goals similar to mine	○ ○ ○ ◉ ○ ○ ○	Have goals different from mine

DO_Status. Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place those who are part of http://careers.barnesandnoble.com/ on this ladder?



10 9 8 7 6 5 4 3 2 1
○ ○ ○ ○ ○ ○ ◉ ○ ○ ○

DO_Ease1. **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case with http://careers.barnesandnoble.com/?

Never	○ ○ ◉ ○ ○ ○ ○	Always

DO_Ease2. **How accessible or easy was it to get job information from http://careers.barnesandnoble.com/?**

Very easy	○ ◉ ○ ○ ○ ○ ○	Not at all easy

DO_Ease3. How difficult on average is it to get job information from http://careers.barnesandnoble.com/?

Very difficult	○	○	○	○	○	◉	○	Not at all difficult

DO_Support. Interactions with those who are part of http://careers.barnesandnoble.com/ are:

Supportive	○	○	○	◉	○	○	○	Not Supportive
Positive	○	○	○	◉	○	○	○	Negative
Encouraging	○	○	○	◉	○	○	○	Not Encouraging

DO_Bridge. Please rate your agreement with the following.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
http://careers.barnesandnoble.com/ is capable of connecting me with job information I could not otherwise access.	○	○	○	◉	○	○	○
http://careers.barnesandnoble.com/ serves as an intermediary between myself and the jobs I sought.	○	○	○	○	○	○	◉
http://careers.barnesandnoble.com/ is not able to connect me with potential employers.	○	◉	○	○	○	○	○
http://careers.barnesandnoble.com/ is not capable of connecting me with others who have valuable information about the job I sought.	○	◉	○	○	○	○	○
http://careers.barnesandnoble.com/ is connected to employers who I could not access otherwise.	○	○	○	○	◉	○	○

DIP_Expert. Bubbles at the ends indicate very strong feelings. Bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

On the scales below, indicate your feelings about job information from .

This question was not displayed to the respondent.

DIP_InfoQual. Please indicated your level of agreement with the following statements:

provides information that is...

This question was not displayed to the respondent.

DIP_Power. **Please indicated your level of agreement with the following statements:**

This question was not displayed to the respondent.

DIP_Homo.
Bubbles at the ends indicate very strong feelings bubbles toward the middle indicate fairly weak feelings. There are no right or wrong answers.

Those who are part of :

This question was not displayed to the respondent.

DIP_Status. Think of a ladder with 10 steps representing where people stand in US society. At step 10 are the best off - those who have the most money, the most education, and the most respected jobs. At step 1 are the worst off - those who have the least money, least education, and least respected jobs or no job.

Where would you place those who are part of on this ladder?



This question was not displayed to the respondent.

DIP_Ease1. **Sometimes information exists that we know would be helpful during job search, but is not readily available because of time, expense, or difficulty in obtaining it.**
In general, how often is this the case with ?

This question was not displayed to the respondent.

DIP_Ease2. **How accessible or easy was it to get job information from ?**

This question was not displayed to the respondent.

DIP_Ease3. **How difficult on average is it to get job information from ?**

This question was not displayed to the respondent.

DIP_Support. **Interactions with those who are part of are:**

This question was not displayed to the respondent.

DIP_Bridge. **Please rate your agreement with the following.**

This question was not displayed to the respondent.

Age. **What is your age?**

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Sex. **What is your sex?**

- ○ Male
- ◉ Female
- ○ Other/Prefer not to answer

Edu. **What is the highest level of school you have completed or the highest degree you have received?**

- ○ Less than high school degree
- ○ High school graduate (high school diploma or equivalent including GED)
- ○ Some college but no degree
- ◉ Associate degree in college (2-year)
- ○ Bachelor's degree in college (4-year)
- ○ Master's degree
- ○ Doctoral degree
- ○ Professional degree (JD, MD)

Race.
Choose one or more races that you consider yourself to be:

- ☑ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Pacific Islander
- ☐ Other ____

MaritalStat.
Are you now married, widowed, divorced, separated or never married?

- ○ Married
- ○ Widowed
- ○ Divorced
- ◉ Separated
- ○ Never Married

Income.
Information about income is very important to understand research results. Would you please give your best guess?
Please indicate the answer that includes your entire household income in (previous year) before taxes.

$30,000 to $39,999

Q193. **Did you find any part of this survey confusing or difficult to understand? If so, your feedback will be used to modify the survey in the future.**

No

PJFit. **Please rate your level of agreement with the following statements regarding your workplace.**

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The things I value in life are very similar to the things that my organization values.	○	○	◉	○	○	○	○
My personal values match my organization's values and culture.	○	○	◉	○	○	○	○
My organization's value and culture provide a good fit with the things that I value in life.	○	○	◉	○	○	○	○
All in all, the job I have is great.	○	○	○	◉	○	○	○
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
In general, I am satisfied with my job.	○	○	○	○	◉	○	○

I am generally satisfied with the kind of work I do in this job.	○	○	○	○	◉	○	○
I am very interested in what others think about the organization.	○	◉	○	○	○	○	○
When I talk about the organization where I work, I usually say "we" rather than "they."	○	◉	○	○	○	○	○
	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The organization's successes are my successes	○	○	◉	○	○	○	○
When someone praises the organization, it feels like a personal compliment.	○	○	◉	○	○	○	○
If a story in the media criticized the organization, I would feel embarrassed.	○	○	○	◉	○	○	○

HoursSearch. **On average, how many hours per month have you spent attempting to find a different job? Enter only the number of hours (e.g. 1, 13, 106, etc.).**

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Appendix C: Survey Decision Tree

