Professional Online Networking: Investigating the Technological and the Human Side of Networking with Professional Social Networking Sites

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Professional social networking sites (SNS) have become a vital part of modern days professional lives. They are a convenient way to receive information about job offers, work-related content, and to connect with other professionals independent of time and space. Research in the field of social capital has shown that a network of people can give access to information, influence, and solidarity which positively affect both subjective and objective career outcomes. Moreover, research has shown that a diverse network is most beneficial as it gives access to non-redundant information, new perspectives, and new ideas. These assets are especially important for both daily work and career paths of knowledge workers in protean careers. Yet, most professional SNS users are mainly connected with others from their direct work environments such as colleagues and university friends. For one thing, this is because of the homophily principle which states that people tend to surround themselves with others who are similar to them. On the other hand, contact recommender systems of professional SNS support connecting with similar others as contact recommendations are usually based on similarity. Professional SNS thereby neglect their own potential of connecting people on a much larger scale and of facilitating diverse online networking.

The cumulative dissertation, therefore, was set out to investigate the technological and the human side of professional online networking to gain evidence on how to encourage professional SNS users to build more diverse business networks. The dissertation consists of four research articles answering the following four research questions:

1. Is there a difference between offline and online professional networking in terms of intensity and in terms of influence factors?
2. How do basic technological features and functions (e.g. diverse contact recommendations) influence professional online networking?
3. How do different information designs of contact recommendations influence professional online networking?
4. How does diverse online networking influence people's social identification with their online business networks?

Research articles one and four focus on the side of the user while research articles two and three focus on the side of the technology. First, article one investigates influence factors on professional (online) networking to give insights into how to continue with subsequent studies and possible ways to change technological features and functions of professional SNS. Second, articles two and three focus on the side of the technology by investigating different technological design aspects (e.g. diverse contact recommendations, types of explanations, types of information) and their influence on professional

online networking. Finally, article four returns to the side of the user by investigating people's social identification with their online business networks when people network more diverse. In the dissertation, the social identity perspective is used as a groundwork for the social capital theory. The four research articles with a total of six studies, combining survey and experimental studies, provide comprehensive insights into how people network with professional SNS. Two survey studies ask people about their real networking behavior and online business networks and four experimental studies have people network with a mock-up business networking site presenting contact recommendations and contact requests of fake people in a controlled set-up.

In summary, the four research articles show that people's online networking is mainly driven by cognitive factors, more specifically, people's knowledge about the benefits of (diverse) networking. When people know about the benefits of networking and the benefits of diverse networking, they network more and more diverse. This can be addressed in the design of contact recommendations by displaying an explanation why someone is recommended thereby hinting at the benefits of networking in general and at the benefits of diversity. Moreover, this can be addressed by presenting contact recommendations emphasizing dissimilarity information in contrast to similarity information. Both different types of explanations and different types of information weaken the homophily principle and encourage people to network more diverse. Besides, basic technological functions influence online networking. When people are presented with a more diverse set of contact recommendations to choose from, they do not network less but consequently, end up with a more diverse business network. Also, when people first see contact requests from others, they subsequently send more contact requests themselves.

Furthermore, the negative affective influence of anxiety towards unknown people is different for offline than for online networking. In line with the social compensation hypothesis, in online settings, the negative influence is weaker than it is in offline settings. When only looking at online settings we see that higher levels of anxiety still reduce the number of people connected with but not the diversity of the resulting networks. Hence, people do not feel less anxiety when connecting with similar others than when connecting with dissimilar others. This is also supported when the influence of anxiety is ruled out. When comparing a bookmark condition where people can only bookmark potential business contacts with a connect condition where people can only send a contact request, there is no difference neither in quantity nor in diversity of the assembled networks. Hence, people do not identify beneficial business contacts when bookmarking but do not send a request because of affective reasons when the only option is to send a request. That again shows that networking is rather driven by cognitive instead of affective influence factors.

Finally, returning to the side of the user we see that more diverse online networking leads to a reduction of social identification with people's online business networks. Diverse online networking reduces social identification with the network and as a result the willingness to support the network. Hence,

diverse online networking compromises the benefits a network provides. Yet, in the absence of similarity, there is also evidence that people attribute others in their online networks with characteristics of their own to perceive them as similar. Shared characteristics function as a reason to identify and compensate for the lack of formal similarity when business networks become more diverse. Moreover, the specific features and functions of professional SNS besides contact recommendations can compensate for the lack of identification.

The central message is the following: The dissertation gives insights into how people use and interact with professional SNS and contact recommendations. It points out possibilities of how these websites can be improved to help users reach the full potential of these vital parts in modern days professional lives. Derived from the predominantly cognitive influences (i.e. knowledge about the benefits of networking and the benefits of diversity) on people's professional online networking, technological features and functions can be designed to encourage people to network more diverse. More diverse networking, however, leads to a reduction of social identification with and willingness to support the network compromising the idea of social capital. Yet, there is evidence that people find other ways to identify with their online business networks and the specific features and functions of professional SNS besides contact recommendations can compensate for the lack of identification as well.

Berufliches online Networking: Eine Untersuchung der technologischen und der menschlichen Seite des Networkings mit beruflichen Social Networking Sites

Berufliche Social Networking Sites (SNS) sind aus dem modernen Berufsleben nicht mehr wegzudenken. Sie sind eine bequeme Möglichkeit, Informationen über Stellenangebote und arbeitsbezogene Inhalte zu erhalten und sich mit Fachleuten unabhängig von Zeit und Raum zu vernetzen. Forschung auf dem Gebiet des sozialen Kapitals hat gezeigt, dass ein Netzwerk Zugang zu Informationen, Einfluss und Solidarität bietet, was sowohl subjektive als auch objektive berufliche Ergebnisse positiv beeinflusst. Darüber hinaus hat die Forschung gezeigt, dass ein diverses Netzwerk am vorteilhaftesten ist, da es den Zugang zu nicht redundanten Informationen, neuen Perspektiven und neuen Ideen ermöglicht. Diese Vorteile sind sowohl für die tägliche Arbeit als auch für die Karrierewege von Wissensarbeiter*innen in proteischen Karrieren besonders wichtig. Dennoch sind die meisten Nutzer*innen auf beruflichen SNS hauptsächlich mit anderen aus ihrem direkten Arbeitsumfeld, wie zum Beispiel mit Kolleg*innen und Freund*innen von der Universität vernetzt. Dies liegt zum einen am Homophilie-Prinzip, das besagt, dass Menschen dazu neigen, sich mit Personen zu umgeben, die ihnen ähnlich sind. Zum anderen unterstützen Kontaktempfehlungssysteme auf beruflichen SNS das Vernetzen mit ähnlichen Personen, da Kontaktempfehlungen in der Regel auf Ähnlichkeit basieren. Berufliche SNS vernachlässigen dabei ihr eigenes Potential, Menschen in einem viel größeren Umfang zu vernetzen und diverses online Networking zu fördern.

Die kumulative Dissertation untersuchte daher die technologische und die menschliche Seite des beruflichen online Networkings, um Erkenntnisse darüber zu gewinnen, wie Nutzer*innen von beruflichen SNS dazu ermutigt werden können, diverse berufliche Netzwerke aufzubauen. Die Dissertation besteht aus vier Forschungsartikeln, die die folgenden vier Forschungsfragen beantworten:

1. Gibt es einen Unterschied zwischen offline und online beruflichem Networking in Bezug auf die Intensität und in Bezug auf die Einflussfaktoren?
2. Wie beeinflussen grundlegende technologische Merkmale und Funktionen (z.B. diverse Kontaktempfehlungen) das berufliche online Networking?
3. Wie beeinflussen unterschiedliche Informationsdesigns von Kontaktempfehlungen das berufliche online Networking?
4. Wie beeinflusst diverses online Networking die soziale Identifikation der Menschen mit ihren beruflichen online Netzwerken?

Artikel eins untersucht zunächst die Einflussfaktoren auf das berufliche (online) Networking, um Hinweise zu geben, wie mit nachfolgenden Studien fortgefahren werden kann und wie technologische Merkmale und Funktionen von beruflichen SNS verändert werden können. Danach konzentrieren sich die Artikel zwei und drei auf die Seite der Technologie, indem sie verschiedene Aspekte des

technologischen Designs (z.B. diverse Kontaktempfehlungen, Arten von Erklärungen, Arten von Informationen) und deren Einfluss auf das berufliche online Networking untersuchen. Schließlich kehrt Artikel vier auf die Seite der Nutzer*innen zurück, indem er die soziale Identifikation der Menschen mit ihren beruflichen online Netzwerken untersucht. In der Dissertation wird die Theorie der sozialen Identität als Grundlage für die Theorie des sozialen Kapitals verwendet. Vier Forschungsartikel mit insgesamt sechs Studien, die sowohl Umfrage- als auch experimentelle Studien kombinieren, bieten umfassende Einblicke in die Art und Weise, wie Menschen mittels beruflicher SNS netzwerken. In zwei Befragungsstudien werden Probanden zu ihrem tatsächlichen Networking-Verhalten und ihrem beruflichen online Netzwerk befragt. In vier experimentellen Studien netzwerken Probanden mit einer simulierten Business-Networking-Seite, die sowohl Kontaktempfehlungen als auch Kontaktanfragen von fingierten Personen in einem kontrollierten Aufbau präsentiert.

Zusammenfassend zeigen die vier Artikel, dass online Networking hauptsächlich durch kognitive Faktoren gelenkt wird, genauer gesagt durch das Wissen um die Vorteile von Networking. Wenn Menschen die Vorteile des Networkings und die Vorteile des diversen Networkings kennen, vernetzen sie sich mit mehr Personen und diverser. Dem kann bei der Gestaltung von Kontaktempfehlungen dadurch Rechnung getragen werden, dass eine Erklärung angezeigt wird, warum jemand empfohlen wird. Diese Erklärung kann auf die Vorteile des Networkings im Allgemeinen und auf die Vorteile von Diversität hinweisen. Darüber hinaus kann dem Einfluss des Wissens durch die Auswahl der Informationen von Kontaktempfehlungen Rechnung getragen werden. Bei der Präsentation von Kontaktempfehlungen können Informationen zu Unterschiedlichkeiten im Gegensatz zu Informationen zu Ähnlichkeiten betont werden. Sowohl unterschiedliche Arten von Erklärungen als auch unterschiedliche Arten von Informationen schwächen das Homophilie-Prinzip und ermutigen Nutzer*innen dazu, sich diverser zu vernetzen. Außerdem beeinflussen grundlegende technologische Funktionen das online Networking. Wird ein diverses Set an Kontaktempfehlungen zur Auswahl angeboten, vernetzen sich Nutzer*innen nicht mit weniger Menschen, sondern erhalten ein diverseres Netzwerk. Wenn Menschen zuerst Kontaktanfragen von anderen beantworten, senden sie darauffolgend selbst mehr Kontaktanfragen aus. Darüber hinaus ist der negative affektive Einfluss der Angst gegenüber unbekannten Personen beim offline Networking anders als beim online Networking. In Übereinstimmung mit der Hypothese der sozialen Kompensation ist der negative Einfluss in online Umgebungen schwächer als in offline Umgebungen. Wenn wir nur online Networking betrachten, stellen wir fest, dass ein höheres Level an Angst zwar die Größe allerdings nicht die Diversität des entstandenen Netzwerks reduziert. Daraus folgt, dass Menschen nicht weniger Angst empfinden, wenn sie sich mit ähnlichen Personen vernetzen als wenn sie sich mit unähnlichen Personen vernetzen. Das wird auch unterstützt, wenn der Einfluss von Angst ausgeschlossen wird. Vergleicht man eine Bookmark-Bedingung, bei der Menschen Geschäftskontakte nur abspeichern können, mit einer Connect-Bedingung, bei der Menschen nur direkt eine Kontaktanfrage senden können, gibt es weder

einen Unterschied in der Größe noch in der Diversität der Netzwerke. Folglich speichern Personen in der Bookmark-Bedingung keine potenziellen Kontakte, denen sie in der Connect-Bedingung aufgrund von affektiven Einflüssen keine Anfrage senden würden. Das zeigt erneut, dass Networking eher von kognitiven als von affektiven Einflussfaktoren gelenkt wird. Wenn wir schließlich auf die Seite der Nutzer*innen zurückkehren, sehen wir, dass diverses online Networking zu einer Verringerung der sozialen Identifikation mit dem beruflichen online Netzwerk führt. Diverses online Networking reduziert die soziale Identifikation mit dem Netzwerk und infolgedessen die Bereitschaft das Netzwerk zu unterstützen. Daher beeinträchtigt diverses online Networking die Vorteile, die ein Netzwerk bietet. Bei fehlender Ähnlichkeit gibt es jedoch auch Hinweise darauf, dass Menschen anderen in ihrem online Netzwerk eigene Eigenschaften und Merkmale zuschreiben, um sie als ähnlich wahrzunehmen. Gemeinsame Eigenschaften und Merkmale dienen als Grundlage, sich mit anderen Personen zu identifizieren und den Mangel an formalen Ähnlichkeiten auszugleichen, wenn berufliche Netzwerke stets diverser werden. Darüber hinaus gleichen auch die spezifischen Merkmale und Funktionen beruflicher SNS, die neben Kontaktempfehlungen existieren, einen Mangel an Identifikation aus.

Die zentrale Botschaft ist die folgende: Die Dissertation gibt Einblick in die Art und Weise, wie Menschen beruflicher SNS und Kontaktempfehlungen nutzen. Sie zeigt Möglichkeiten auf, wie diese Plattformen verbessert werden können, um es Nutzer*innen zu ermöglichen, das volle Potenzial dieser Plattformen auszuschöpfen. Abgeleitet von den überwiegend kognitiven Einflüssen (d.h. Wissen um die Vorteile des Networkings und die Vorteile von Diversität) auf das berufliche online Networking, können technologische Merkmale und Funktionen so gestaltet werden, dass sie Menschen zu diversem online Networking ermutigen. Diverses online Networking führt jedoch zu einer Verringerung der sozialen Identifikation mit und der Bereitschaft zur Unterstützung des Netzwerks. Das kompromittiert die Idee der Theorie des sozialen Kapitals. Es gibt jedoch Hinweise darauf, dass Menschen andere Wege finden, um sich mit Personen in ihrem beruflichen online Netzwerk zu identifizieren, und die spezifischen Merkmale und Funktionen von beruflichen SNS, die neben Kontaktempfehlungen existieren, können einen Mangel an Identifikation ausgleichen.

CONTENTS

GENERAL INTRODUCTION

Professional social networking sites (SNS) such as LinkedIn and the German platform XING have become increasingly popular within the last years. In 2020, the international platform LinkedIn had more than 700 million registered users worldwide and more than 15 million users in Germany. The German professional SNS XING had more than 17 million users in Germany, Austria, and Switzerland. Next to their personal users, LinkedIn and XING are used by organizations and recruiters to advertise jobs and contact potential employees. Both platforms claim to have managers and academics as their most important user group, advertising their usage with the benefits of connecting with people who might be beneficial for someone's career, finding internships and positions, and gaining access to important information (Bohnensteffen, 2020; Firsching, 2020; Legeland, 2017; XING Marketing Solutions, 2020). When it comes to informational content, LinkedIn has recorded an 89 percent increase in live streams since March 2020 and a 50 percent increase in shared content within the last year. People can share images, videos, online links, or self-written text. Moreover, there are two million groups on LinkedIn and 85.000 groups on XING that function as discussion forums where members can discuss, share information, and exchange views with a focus on specific topics or industries. Both platforms also offer events, either as online events with live streaming or as an organizational tool for real-life events thereby combining the offline and the online world of networking (Bielawa, 2020; Clark, 2020; Firsching, 2020; Zehmisch, 2017).

As we can see, professional SNS have become a vital part of modern days professional lives. Millions of people especially in academic and managerial professions use professional SNS in their working life to look out for job offers, to receive important information about their business sector, or to discuss current topics with other professionals. One crucial element of SNS use is the personal network someone builds. These individual business networks influence how much information and what type of information people receive. The starting point to an individual business network is professional networking. However, when we take a closer look at the topic of professional networking with its benefits and constraints, we see that still today with modern technology there is room for improvement. Although professional SNS offer the unprecedented opportunity to connect with professionals from around the globe independent of time and space, usually online business networks consist of people from someone's direct work environment such as colleagues and university friends who are already known offline (Papacharissi, 2009; Utz & Muscanell, 2014). Professional SNS themselves claim to be a

convenient way to connect with colleagues, college classmates, and friends disregarding their own potential of connecting people on a much larger scale. Hence, although professional SNS make it very effortless to build large business networks providing access to important information, professional SNS users make little use of it. But how can we change that? How can we encourage professional SNS users to take full advantage of these new possibilities?

In the present chapter, I will provide a basic theoretical background for my dissertation. First, I will give an overview on the literature on professional networking by focusing on the main purpose and the benefits of professional networking especially for knowledge workers. Second, I will demonstrate the obstacles to achieving all the potential benefits of professional networking. Third, I will point out the specifications of professional SNS in the realm of professional networking and how especially professional SNS can help to overcome the previously discussed obstacles. Finally, I will illustrate the research questions of the current dissertation, at the same time outlining how the dissertation is going to answer them.

Professional Networking for Knowledge Workers

To begin with, professional networking has been investigated in multiple disciplines. These include the research fields of management (e.g. Forret & Dougherty, 2001; Michael & Yukl, 1993), organizational groups and teams (e.g. Garcia-Lorenzo, 2006; Gibson, Hardy III & Buckley, 2014), and leadership (e.g. Venkataramani, Green & Schleicher, 2010). As a result, professional networking is known by various terms, various definitions, and various activities that constitute professional networking. The beginning of networking research approximately started with Granovetter (1973) and his famous article “The Strength of Weak Ties” directing attention to the value of so-called weak ties in contrast to strong ties. Granovetter (1973) argued that not only strong ties such as family members and close friends but also weak ties such as acquaintances, colleagues, and distant friends can have value when it comes to personal support.

One of the first definitions of professional networking was established by Gould and Penley (1984, p. 246) who defined networking as “the practice of developing a system or ‘network’ of contacts inside and/or outside the organization, thereby provided relevant career information and support for the individual.” Over the last 30 years there have been several more definitions of professional networking. For instance, Michael and Yukl (1993, p. 328f.) defined networking as, “behaviors designed to build informal interpersonal relationships with people inside and outside the organization. In general, networking involves the exchange of affect (liking,

friendship), information, benefits, and influence". Behaviors that build and maintain informal interpersonal relationships are for example calling and visiting people, socializing before and after formal meetings, and attending social activities. Forret and Dougherty (2001, p. 284) defined professional networking as an "individual's attempt to develop and maintain relationships with others who have the potential to assist them in their work or career." Similarly, Whiting and De Janasz (2004, p. 283) talked about networking as "building and nurturing personal and professional relationships to create a system or chain of information, contact, and support, [which] is crucial for career and personal success." Finally, in 2009, Wolff and Moser (p. 196) defined networking as "behaviors that are aimed at building, maintaining, and using informal relationships that possess the (potential) benefit of facilitating work related activities of individuals by voluntarily granting access to resources and maximizing common advantages." Networking consists of work-related activities such as "going out for drinks with business acquaintances after work, introducing oneself to colleagues, or passing on professional gossip" (Wolff & Moser, 2010, p. 239).

Regarding terms, professional networking is sometimes also called *strategic* (Ibarra & Hunter, 2007) or *instrumental* networking (Casciaro, Gino & Kouchaki, 2014). While all these definitions vary in whether networking is divided into intra- and extra-organizational, whether networking consist of three stages (building, maintaining, and using) or only two stages (building and maintaining), or whether the definitions include the assets that will be exchanged (e.g. information), these terms reflect what all definitions have in common. They all share their goal orientation, meaning that networking is always defined by the purpose of professional success. According to all these definitions, the purpose of professional networking is to build (maintain, and use) social capital. While professional networking is at the individual behavioral level of a person connecting with others, social capital refers to the network that is built by connecting with others at the structural level surrounding the individual. Just like professional networking, social capital has been investigated in different research fields with different definitions. Integrating definitions from more than 20 researchers, Adler and Kwon (2002, p. 23) define social capital as "the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor." Hence, professional networking – meaning the building and maintaining of relationships with others – creates a network of people who can potentially provide information, influence, and solidarity for professional success.

A long line of research of about 30 years has shown that a network of people providing information, influence, and solidarity can influence several career outcomes. In fact, professional networking and social capital are positively associated with both subjective career outcomes such as career satisfaction (Ng, Eby, Sorensen, Feldman, 2005; Porter, Woo & Campion, 2016; Seibert, Kraimer & Liden, 2001; Wolff & Moser, 2009) and objective career outcomes such as finding a new job (Porter, Woo & Campion, 2016; Van Hoye, Van Hooft & Lievens, 2009; Wolff & Moser, 2010; Yakubovich 2005), increase in work performance (Cross & Cummings, 2004; Sparrowe, Liden, Wayne & Kraimer, 2001; Thompson, 2005), increase in salary (Gould & Penley, 1984; Ng et al., 2005; Seibert, Kraimer & Liden, 2001; Wolff & Moser, 2009), and even promotions (Forret & Dougherty, 2004; Ng et al., 2005; Seibert, Kraimer & Liden, 2001; Wolff & Moser, 2010).

Moreover, in line with theories of boundaryless (Arthur, 1994; Arthur & Rousseau, 1996) or protean careers (Hall, 1976; 2001) professional networking represents an important career management tool. Boundaryless or protean careers are characterized by self-direction and autonomy of the individuals who are planning their own careers independent of their current organizations. Career choices of boundaryless or protean careers are based on the individuals' needs and values in contrast to their organizations' needs and values. Resulting career paths usually include a higher degree of mobility between positions and organizations, changing work settings, and changing work content. Hence, those careers require people to adapt and evolve by learning new abilities and skills and are claimed to be prominent on the field of knowledge work (Briscoe, Hall & DeMuth, 2006; Donnelly, 2009).

"The main feature differentiating knowledge work from other conventional work is that the basic task of knowledge work is thinking. Although all types of jobs entail a mix of physical, social, and mental work, it is the perennial processing of non-routine problems that require non-linear and creative thinking that characterizes knowledge work" (Reinhardt, Schmidt, Sloep & Drachsler, 2011, p. 150). According to Davenport (2005) knowledge workers are responsible for innovation, product invention, service invention, and organizational strategy creation. Consequently, for knowledge workers professional networking and social capital are not only a career management tool but also a source of information for daily non-routine, non-linear, and creative work. A business network can help to receive crucial information at the right place at the right time.

Especially when it comes to non-routine work for product innovation, strategy creation, and creativity a diverse network is most beneficial. Numerous studies have investigated the relationship between social network composition and the origins of creativity and innovation. They range from studies analyzing the micro level of dyadic exchanges within networks, studies analyzing the structure of networks of individuals, up to studies analyzing the networks of cities and communities in Great Britain at the population level. They all have concluded that diversity is key to creativity and innovation. This is because a diverse and low-interconnected network of people can give access to non-redundant information, new perspectives, and new ideas. Combined wisely, they can lay the foundation for innovative methods and approaches for the newly arising complexities of our time (Baer, 2010; Burt, 2004; Eagle, Macy & Claxton, 2010; Parise, Whelan & Todd, 2015; Perry-Smith, 2006; Sosa, 2011).

Diverse Professional Networking

So far, we know that networking in general and especially diverse networking is most beneficial for professional success. While it is easy to state that diverse networking is beneficial, it is not as simple to define diversity. In general, diversity is defined as the "distribution of differences among the members of a unit with respect to a common attribute X" (Harrison & Klein, 2007, p. 1199). Diversity is a unit-level construct. It can only describe a unit but not differences between individuals within a unit. Moreover, diversity is attribute-specific. A unit cannot be diverse per se, it can only be diverse with respect to a specific attribute. Hence, a unit can be diverse concerning one attribute for example age and not be diverse concerning another attribute for example gender at the same time. Besides, there are three distinctive types of diversity: separation, disparity, and variety (Harrison & Klein, 2007). Separation refers to diversity on a horizontal continuum. It applies to opinions, values, beliefs, and attitudes. A minimum of separation is when all members of the unit share the same opinion, values, beliefs, or attitudes. A maximum of separation is when members of a unit equally split into the two extremes of the spectrum forming oppositions. Higher levels of separation lead to reduced cohesiveness, more interpersonal conflict, distrust, and decreased task performance. Disparity refers to diversity on a vertical continuum. It applies to pay, income, prestige, status, authority, and social power. A minimum of disparity is when all members of the unit are at the same level. A maximum of disparity is when one member of the unit is at the top and everyone else is at the bottom of the spectrum. Higher levels of disparity lead to more within-unit competition, resentful deviance, reduced member input, and withdrawal.

Finally, variety refers to qualitative diversity without a continuum. It applies to expertise, industry experience, knowledge, and information. A minimum of variety is when all members of a unit share the same expertise, industry experience, knowledge, and information. A maximum of variety is when all members of a unit evenly spread across all possible categories. Higher levels of variety lead to greater creativity, innovation, higher decision quality, more task conflict, and increased unit flexibility (Harrison & Klein, 2007). Hence, regarding professional networking and the building of a business network the required diversity is variety concerning people's expertise and industry experience depending on their occupations. Only diversity concerning people's expertise and occupations guarantees non-redundant knowledge and information. But do people naturally form diverse business networks? One of the basic principles that influences with whom we build social relations is the homophily principle. It states that "a contact between similar people occurs at a higher rate than among dissimilar people" (McPherson, Smith-Lovin & Cook, 2001, p. 416). That is because people tend to surround themselves with others who are similar to them concerning "sociodemographic, behavioral, and intrapersonal characteristics" (McPherson, Smith-Lovin & Cook, 2001, p. 415; Ahuja, Soda & Zaheer, 2012; Ibarra, 1992; Ingram & Morris, 2007). "Homophily in ethnicity creates the strongest divides in our personal environments, with age, religion, education, occupation, and gender following in roughly that order" (McPherson, Smith-Lovin & Cook, 2001, p. 415).

Moreover, researchers have found similarity to play a major role in private relationship initiation and maintenance. Similarity with the other person implies familiarity and trust which eases relationship formation (Knapp & Vangelisti, 2009; Regan, 2011). People pay more attention to similar others than to dissimilar others because similar others are expected to be more likely to engage in a conversation and to be more trustworthy (Greene, Derlega & Mathews, 2006; Regan, 2011). Also, Kaptein, Castaneda, Fernandez, and Nass (2014) showed that people experience stronger feelings of connectedness with similar others than with dissimilar others. Besides, similarity has been found to affect interpersonal liking and attraction towards others in online settings (Antheunis, Valkenburg & Peter, 2010). These authors showed that similarity was associated with higher levels of liking and attraction but at the same time with lower levels of uncertainty towards other SNS users (Antheunis, Valkenburg & Peter, 2010). Finally, Trepte, Reinecke, and Juechems (2012) identified similarity as the basis of private online interactions in the context of online gaming as people received more social support from similar others than from dissimilar others.

Accordingly, people's personal networks are rather homogeneous than heterogeneous. While in a private context it is perfectly fine to have relationships with others that are similar in age, interests, and hobbies, in a professional context the homophily principle is against the requirements of an eligible business network. However, when it comes to relationship formation, people do not make a difference between a private and a professional setting. For example, when we look at work team formation processes of students at universities or of employees in organizations, we find the same pattern as for private networking. Researchers have found that when students assemble their work teams "they are ultimately more likely to choose their prior social connections" (Gómez-Zará et al. 2019, p. 1). Moreover, Hinds, Carley, Krackhardt, and Wholey (2000, p. 226) showed that "when selecting future group members people are biased toward others of the same race, others who have a reputation for being competent and hardworking, and others with whom they have developed strong working relationships in the past." Hence, people's "decisions lead to nondiverse and segregated teams, where most of the expertise and social capital are concentrated in a few teams" (Gómez-Zará et al. 2019, p. 1). Even when people are trained in diversity trainings to reduce these biases, assemble more diverse teams, and hire more diverse people, they have difficulties in overcoming their natural tendencies (Chang et al., 2019; Dobbin & Kalev, 2016; Noon, 2018).

In conclusion, the homophily principle and the diversity requirements of a business network are not reconcilable. When we follow our natural principles, we will automatically form networks that are homogeneous. Usually business networks consist of people from the direct work environment such as colleagues and university friends who have a similar professional background and a similar occupation (Papacharissi, 2009; Utz & Muscanell, 2014). Moreover, in offline settings there are additional obstacles to diverse networking. Usually conferences and business events are meant for a specific industry or business sector. Depending on the topic of the event, only people with fitting expertise and occupations will attend leading to the fact that most people attending will have similar expertise and occupations. Consequently, networking a diverse set of people at such business events is hard to achieve if not impossible. However, today there is a second option to professionally network. As mentioned above, professional SNS became increasingly popular in recent years and they offer new opportunities for professional networking.

Professional Networking with Professional Social Networking Sites

Professional SNS offer plenty of features to their users. Professional SNS allow "users to create a profile based on their professional affiliation and connect to professional contacts within and outside their professional networks" (Papacharissi, 2009, p. 200). Profiles are used to easily present oneself and one's professional achievements by providing information about prior organizations and positions, about educational backgrounds and expertise, and about skills. Once a profile was created, people can build their networks by connecting with other users. They can either proactively send contact requests to others or reactively accept contact requests from others. When people are connected, they see each other's content meaning posts of self-created information, online links, images, or videos. These posts can be liked, commented, and shared and anytime people interact with a post by liking, commenting, or sharing, the post becomes visible to everyone in their networks as well. It becomes visible to them, even when they are not directly connected with the creator of the post. That way, information can spread through different networks far beyond the original network of the creator.

Most important, when it comes to networking on professional SNS, is that professional SNS support their users networking pursuits by recommending people to connect with. Users can connect with other users either by name search if the potential business contact is already known or with the help of contact recommendations by the system. Contact recommender systems display numerous people defined by an algorithm based on who the platform assumes users are interested in connecting with. Moreover, unlike intra-organizational SNS, professional SNS such as LinkedIn or XING are public and available for everyone to create an account. Hence, they are not limited within the boundaries of an organization and people from different organizations can interact with each other on the platform. Also, everyone who creates an account can be recommended as potential business contact by the system.

When we remember the requirements of a business network that can provide access to non-redundant information, new perspectives, and new ideas for non-routine, non-linear, and innovative tasks, contact recommendations on public professional SNS can build the perfect starting point. Contact recommendations have the unprecedented potential to recommend a diverse set of people with different expertise and different occupations so people can build diverse networks that foster creativity and innovation (Harrison & Klein, 2007). Yet, current contact recommender systems are usually based on similarity and as a result recommend similar instead of dissimilar others. They use similarity of profile information, experiences, companies,

industries, schools, or friends of friends as basis for recommendation (Agarwal & Bharadwaj, 2013; Chamoso, Rivas, Rodríguez, Bajo, 2018; Chen, Geyer, Dugan, Muller & Guy, 2009; Guy, Jacovi, Perer, Ronen & Uziel, 2010; Huang, Tunkelang, Karahalios, 2014; LinkedIn, 2020). Unfortunately, the approach of recommending people based on similarity only reinforces people's natural tendencies of connecting with similar others (McPherson, Smith-Lovin & Cook, 2001). Besides, with this approach, these platforms neglect scientific evidence that diverse business networks are most beneficial for professional success especially for their most prominent user group of knowledge workers in academic and managerial professions. Hence, when we ask the question on how to encourage professional SNS users to take full advantage of these platforms' new possibilities, we more specifically need to ask how to encourage users to build more diverse business networks?

This question can only be answered by investigating how users interact with professional SNS. To do so, we need to consider the affordance framework since "an affordances perspective represents a relational approach to understanding how people interact with technology" (Evans, Pearce, Vitak & Treem, 2017, p. 35). The term *affordance* was first coined by Gibson in 1979. Coming from the psychology of visual perception in different conditions of lightning, Gibson (1979) defined the new concept as the interaction between an environment and an animal to be "not simply the product of the two factors […] but an entity in itself" (Trepte, Scharkow & Dienlin, 2020, p. 107). An affordance is something that the environment offers the animal in relation to what the animal can do with what is offered but independent of the animal's perception of what is offered (Gibson, 1979). For example, a table offers the affordance of "hidability" but only for people who are small enough to hide underneath the table independent of people's perception of the table offering a place to hide. For other people the same table offers the affordance of "sitability" but only for people who are tall enough to climb on and sit on the table independent of people's perception of the table offering a place to sit.

Only a few years later, the concept was introduced to the field of human-computer-interaction (HCI) by Norman (1988) to answer the question of who defines the usage of technology. Does the technology and its features define how it is used or does the user define how it is used? As early as Gibson (1979) and Norman (1988) combined the two perspectives by stating that the environment meaning the technology can only offer the possibility for action. However, the possibility for action is interlinked with the capability for action of the animal meaning the user (Evans et al., 2017; Gibson, 1979; Norman, 1988). While Norman (1988) did acknowledge that

neither technology nor user alone can define the use of technology, he did not acknowledge that affordances are independent of users' perception. He was convinced that users must be aware of what they can do with a technology to even use it. He defined affordances as "the perceived or actual properties of the thing, primarily those fundamental properties that determine just how the thing could possibly be used" (Norman, 1988, p. 9). In 1999, he tried to correct the deviation from the original definition from Gibson (1979) by saying that he should have spoken of "perceived affordances" (Norman, 1999). Yet, in the meantime the previous definition lead to numerous articles investigating how to implement and design technological features. Researchers in the field of HCI, thereby, prioritized the side of the technology because they considered the design aspects to be responsible to inform the user about how the technology is used (e.g. Gaver, 1991; 1992; Hutchby, 2001; Norman, 1988; Vicente & Rasmussen, 1992). Since 1999, several researchers have tried to clarify and to evolve the concept of affordances within HCI research (e.g. Baerentsen & Trettvik, 2002; McGrenere & Ho, 2000; Turner, 2005). Yet, "the exact meaning of the term continues to be a subject of ongoing debate" and its application in interaction design remains vague (Kaptelinin & Nardi, 2012, p. 1; Oliver, 2005; Torenvliet, 2003).

The concept was also investigated in the field of communication research. Here, on the other hand, people argued that affordances only emerged through the agency of the user in interaction with technology thereby prioritizing the side of the user (e.g. Boczkowski, 2004; Boudreau & Robey, 2005; Oudshoorn & Pinch, 2003). "By claiming that affordances do not cause behavior but simply make it possible, Gibson made room for the idea of agency" (Withagen, de Poel, Araújo & Pepping, 2012, p. 257). Hence, communication researchers are convinced that technological features can only structure usage, they cannot determine it. That is because technological features are "technically embedded, static, and objectively defined" (Trepte, Scharkow & Dienlin, 2020, p. 108) while usage is dynamic as it depends on dynamic goals and intentions of the user. Another argument for the focus on human agency is, that the same technological features and functions can be used for different outcomes and goals. Outcomes and goals which are themselves independent of technological features (Humphreys, Karnowski & von Pape, 2018). Yet again, the concepts that evolved from the original definition by application and operationalization are relatively vague. As a result, in the field of communication research there were also variations of uses of the term and misunderstandings of the concept (Evans et al., 2017; Faraj & Azad, 2012; Parchoma, 2014).

Both disciplines investigated the concept independent of each other, using their own definitions, their own methods and their own understandings of the term leading to misunderstandings in both domains. Yet, both perspectives have in common that neither technology nor users alone can define how technology is used. It is an interplay of possibilities on the side of technology and of capabilities on the side of the user. In conclusion, "affordances neither belong to the environment nor the individual, but rather to the relationship between individuals and their perceptions of environments" (Parchoma, 2014, p. 361; Evans et al., 2017; Leonardi & Barley, 2008). Thus, Humphreys, Karnowski and von Pape (2018) describe an affordance as something that is embodied by the technology but enacted by the user.

When applying the concept to professional SNS, we can first look at the four affordances Treem and Leonardi (2012, p. 143) defined for intra-organizational SNS. These are editability, persistence, visibility, and association. Editability means that content can be carefully prepared and edited before publication and sometimes even modified and revised after publication. Editability can be used to regulate personal expression, to target content for specific audiences, and to enhance the quality of information. Persistence means that content remains accessible even when the creator stops using the website since it does not expire or disappear. Persistence can be used to collect knowledge and information and to grow content over time. Editability and persistence, however, are not specific to (professional) SNS. Many technological platform and services such as e-mail, message services, websites, wikis, and blogs offer the possibility to craft information before and sometimes even edit information after publication. Moreover, usually once published information stays online and does not get deleted. What is specific for (professional) SNS, on the other hand, are visibility and association with visibility only existing because of association. Treem and Leonardi (2012) consider association to be the primary specification of SNS and there are two forms. First, the association between two individuals, usually referred to as a social tie. Second, the association between individuals and their created content. People are associated with their posts, comments, and shares making their opinions, actions, and work achievements visible. This can lead to so-called meta knowledge about who does and knows what which in the context of professional SNS is also referred to as ambient awareness (Levordashka & Utz, 2016; 2017). Thus, the association between users and between users and their content leading to users' visibility and meta-knowledge about their expertise and skills, are the very attributes of SNS that facilitate the beneficial outcomes of a personal business network which are access to information, influence, and solidity. "In other words, SNSs provide association with the aim of connecting users, which promotes the accumulation

of social capital and the exchange of personal information" (Trepte, Scharkow & Dienlin, 2020, p. 107).

The Current Dissertation

When humans interact with technology, the interaction is defined by both the technological side and the human side. Hence, these are the two sides I am going to look at in my dissertation. For one thing, I am convinced that technology must offer information on how it used. It is important that people know about technological features and functions, because when they do not realize their options, they will simply not use them. For example, when people do not realize that a button is clickable, they will not click it leading to the fact that its existence becomes irrelevant. Hence, I agree with Norman's (1988) perspective of using design aspects to inform people about how to use technology. Yet, I also agree with communication researchers' perspective that without motivation, intention, or goals of the users, meaning without agency, there will be no usage. Also, it is possible that people use the same features and functions for different outcomes, depending on their abilities and goals. Hence, features and functions do exist independent of usage, yet their meaning is defined by usage. That is why, in contrast to the original definition by Gibson (1979), technological environments should not be analyzed independent of users' perception. Consequently, technology must offer information on how to use it with design aspects or with other sorts of information such as instructions but at the same time these design aspects or information need to fit people's motivations and goals.

With respect to the question of how to encourage users to build more diverse business networks, contact recommendations on professional SNS are a perfect feature to start with. By defining who is getting recommended and by defining how recommendations are presented, people can be informed about how to make the most of contact recommendations. Moreover, with the design and presented information, people's motivations or goals for networking can be addressed. Furthermore, Withagen et al. (2012) argue that design aspects can also invite people to behave in a certain way. They state: "apparently, the environment is not a neutral manifold of action possibilities the agent simply chooses from; rather, the environment can invite a certain action or even urge a person to do something" (Withagen et al., 2012, p. 253). In 2016, Davis and Chouinard even go further by claiming that technology can be designed to request, demand, encourage, discourage, allow, and refuse usage. Technology can for example refuse usage when features and function are only available to the administrator but not for the regular user. Usage can be discouraged by implementing obstacles that make usage hard to achieve

(e.g. unsubscribing from a newsletter usually requires finding a very small unsubscribe button). Requesting usage means that one way of action is preferred while alternative actions remain possible (e.g. entering a phone number when ordering online is voluntary). Demanding usage, on the other hand, only allows one way of action with no possible alternatives (e.g. entering a street address when ordering online is mandatory). Allowing usage simply means that there is no preference and all actions are accepted. Finally, encouraging usage means to fosters one type of usage while suppressing another one. For example, Facebook's and Instagram's algorithms encourage users to engage in liking, commenting, and sharing by mainly presenting posts that are most likely to evoke that interaction. On the other hand, posts that are less likely to evoke that rection are presented with a lower probability (Davis & Chouinard, 2016).

In conclusion, there is a new line of reasoning on how technological features and functions can be designed to inform, encourage, and invite users to certain behaviors, still acknowledging users' agency and their personal motivations, goals, and needs. Hence, the current dissertation aims at investigating the technological and the human side of contact recommender systems usage. First, it aims at investigating influence factors on professional networking offline and online on the side of the individual to get insights into which motivations and goals to address with the design of contact recommendations. Second, it aims at encouraging or inviting professional SNS users to build larger and more diverse online business networks with the help of contact recommender systems. Third, the dissertation returns to the side of the user and aims at identifying potential negative side effects of diverse professional online networking. When people are invited to diverse networking, accept the invitation, and accordingly network more diverse, how will this affect their relationships with their business networks? Will a deviation from their natural principles of relationship formation affect people's relationships with one another? Will diverse networking affect people's willingness to support their networks by sharing information, influence, and solidarity? Since diverse professional networking has been shown to have many benefits (Baer, 2010; Burt, 2004; Eagle, Macy & Claxton, 2010; Parise, Whelan & Todd, 2015; Perry-Smith 2006; Sosa, 2011), are there also potential negative side effects? To investigate this question, I will look at people's social identification with their networks as a groundwork for the social capital theory and the willingness so support other people in the network by sharing information, influence, and solidity. The cumulative dissertation is organized in four research articles addressing four research questions.

The fist article addresses research question one: Is there a difference between offline and online professional networking in terms of intensity and in terms of influence factors? The first article will focus on the individual and give an overview on influence factors associated with professional networking both offline and online. It will give an overview on previously identified influence factors by combining research on professional offline networking and research on (private) online networking with SNS. The two research domains will be brought together by jointly investigating professional offline and professional online networking in an exploratory survey study. The study is set out to give insights into how to continue with subsequent studies and possible ways to address users' motivations, needs, and goals to encourage them to build more diverse business networks.

The second article will address research question two: How do basic technological features and functions (e.g. diverse contact recommendations) influence professional online networking? In an experimental study, participants will network with a mock-up business networking site sending and accepting contact requests. Article two will look at the basic idea of encouraging people to network more diverse by simply recommending a more diverse set of people. Second, article two will look at whether people network differently when they send contact requests compared to when they only bookmark potential business contacts. That is meant to examine whether people can cognitively identify beneficial business contacts when bookmarking but might not be sending a request because of affective reasons when the only option is to send a request. Third, the second article will validate the results from the survey study in an experimental design. Finally, the second article will propose ways to improve professional SNS to encourage diverse online networking which will be investigated in article three.

The third article will address research question three: How do different information designs of contact recommendations influence professional online networking? With two experimental studies, the third article will investigate new ways of recommending business contacts by offering an explanation why someone is recommended and by offering different types of information about the recommended business contact. The first study will focus on two types of explanations with one hinting at dissimilar others and the second one additionally hinting at the benefits of diversity compared to when no explanation is given. The second study will additionally compare two types of information with one emphasizing dissimilarity information as a new way of presenting contact recommendations in contrast to emphasizing similarity information as it is performed by current contact recommender systems.

Finally, the fourth article will address research question four: How does diverse online networking influence people's social identification with their online business networks? The fourth article will again investigate the users' side by looking at people's social identification with and their willingness to support towards their networks depending on network diversity. One experimental and one survey study will also give insights into people's perception of their networks as either one entity or as different subgroups of people. Besides, the fourth article will look at characteristics that professional SNS users attribute to other people in their networks. In the absence of formal similarities, people might attribute others in their networks with characteristics of their own to perceive them as similar. Shared characteristics can function as reason to identify with others when business networks become more diverse.

The dissertation will end with a general discussion summarizing the overall findings and providing theoretical and practical implications concerning the technological and the human aspects of professional online networking. Moreover, strengths and limitations of the dissertation will be discussed and ideas for future research will be outlined.

ARTICLE I

Professional Networking:

Exploring Differences Between Offline and Online Networking

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Professional Networking:
Exploring Differences Between Offline and Online Networking

Abstract

Professional networking has mostly been researched in offline contexts. With professional social networking sites (SNS), such as LinkedIn or the German platform XING, professional networking can be extended to online contexts. Therefore, this study examines if people differ in the intensity of offline and online networking and if influence factors differentially predict offline and online networking. An exploratory online survey of working people (N = 326, mean age = 37 years, 56% women) revealed that mean values among the four different networking types did not differ significantly. However, people can be divided into four clusters of networkers (the minimal, the heavy, the mainly offline, and the mainly online networkers). When looking at influence factors, there is a positive association of people's knowing about the benefits of networking and their networking intensity for all types of networking offline and online. Beyond that, the negative affective influence of anxiety towards unknown people on networking shows an interaction effect with networking type as it is stronger for offline networking than it is for online networking. The results indicate that professional social networking sites might help people with their networking pursuits by reducing negative emotions associated with networking, thereby contributing to the social compensation hypothesis.

1. Introduction

Professional networking, defined as an "individual's attempt to develop and maintain relationships with others who have the potential to assist them in their work or career" (Forret & Dougherty, 2001, p. 284), is an important tool for career success. This applies especially for knowledge workers (Hube, 2005) who pursue boundaryless (Arthur & Rousseau, 1996) or protean careers characterized by self-direction and autonomy of the individual (Hall, 1976; 2001). Multiple studies have revealed a positive relationship between professional offline networking and subjective and objective career outcomes (e.g. Forret & Dougherty, 2004; Wolff & Moser, 2009; 2010). However, although there are hundreds of articles and books on how to network for business purposes (e.g. Byham, 2009; Casciaro, Gino & Kouchaki, 2016; Cross & Thomas, 2011; Misner & Hilliard, 2017), starting a conversation with unknown people at crowded business events might feel uncomfortable and intimidating, not only for shy and

anxious people. With professional social networking sites (SNS), such as LinkedIn or the German platform XING, however, networking can be performed in online settings as well.

Professional SNS allow "users to create a profile based on their professional affiliation and connect to professional contacts within and outside their professional networks" (Papacharissi, 2009, p. 200). Sending and accepting contact requests can be realized with a click, messages can be carefully edited, and professional SNS support their users' networking pursuits by recommending business contacts to connect with. Today, experts and knowledgeable people from all sorts of fields and from all over the world can potentially become part of your business network. Yet, many people are online mainly connected with others they know from their direct work environment, such as colleagues and university friends, making their online networks a mere copy of the offline ones (Papacharissi, 2009; Utz & Muscanell, 2014). Utz and Breuer (2019) have also found that people who do network offline are also more likely to use professional SNS. Moreover, Boyd and Ellison (2008, p. 211) specifically use the term "social network site" instead of "social networking site" as they claim: "we chose not to employ the term "networking" [since] "networking" emphasizes relationship initiation, often between strangers. While networking is possible on these sites, it is not the primary practice on many of them […]." Consequently, we ask: Should professional offline and professional online networking be considered as being independent from one another or are professional SNS only used to digitally manage offline networking?

The goal of this article is to compare professional offline and professional online networking. To do so, we first compare the intensity of engaging in offline networking with the intensity of engaging in online networking. We also explore whether different types of networkers can be identified (e.g. people who mainly network offline; people who network both offline and online). In a second step, we exploratorily examine whether personality, motivational, and affective factors are differentially associated with offline and online networking. To identify relevant factors, we build on literature on professional offline networking on the one side and on literature investigating SNS use in private contexts on the other side, thereby bringing these hitherto unrelated fields together.

2. Literature Review

Professional networking is usually defined as set of behaviors aimed at building and maintaining interpersonal relationships that have the potential to benefit work-related activities

(Forret & Dougherty, 2001; Wolff & Moser; 2006). Wolff and Moser (2006) additionally distinguish between intra-organizational networking with colleagues and extra-organizational networking with people from other organizations. Moreover, they differentiate between building, maintaining, and using contacts. Research on the benefits or antecedents of professional networking has implicitly focused on offline networking as the assessment of professional networking has mostly focused on offline activities. Hence, concerning professional offline networking, there is a rich set of studies to draw evidence from. In contrast, studies on professional online networking are very sparse (Blank & Lutz, 2017; Richter, Riemer & vom Brocke, 2011; Zhang & Leung, 2015), even though these platforms have become very popular with millions of users worldwide (Firsching, 2020). Due to its independence of time and space, online networking is especially suited for networking with contacts outside the own organization. People can send out contact requests (proactive networking) or simply accept received contact requests from others (reactive networking).

Interestingly, although the benefits of professional networking especially come from making new contacts, with their design of contact recommendations, professional SNS foster connecting with people someone already knows (Papacharissi, 2009; LinkedIn, 2020). Thus, Ellison and Boyd's (2013) claim that SNS are more accurately termed social network sites than social networking sites also holds in a professional context. The claim is based on the fact that professional SNS are rather used to show existing networks than they are used for actively seeking new connections. Hence, it is not clear whether people engage differentially in various forms of networking or whether different types of networkers can be distinguished (e.g. people with a preference for either offline or online networking or people who engaging in both forms to the same extent). Our first research question is therefore: RQ1: Is there a difference between offline and online professional networking in terms of intensity?

Despite the formal differences between offline and online networking, research has identified similar benefits. Work on professional offline networking has found positive effects both on subjective and objective career outcomes such as finding a new job, increase of work performance, salary increases, and even promotions (e.g. Blickle et al., 2012; Bozionelos, 2008; Forret & Dougherty, 2004; Kim, 2013; Ng & Feldman, 2014; Spurk, Hirschi & Dries, 2019; Thompson, 2005; van Hoye, van Hooft & Lievens, 2009; Wolff & Moser, 2009; 2010). A recent line of research has investigated the benefits of professional networking via professional SNS. That work has found that professional online networking also leads to informational benefits,

job search assistance, work-related assistance, and career sponsorship (e.g. Baruffaldi, Di Maio & Landoni, 2017; Davis, Wolff, Forret & Sullivan, 2020; Nikitkov & Sainty, 2014; Utz & Breuer, 2016; 2019; Utz, 2016). It is less clear, however, whether the influence factors on offline and online networking are also the same. Similar influences have been discussed, but their relationships with offline and online networking have not been compared systematically. Our second research question therefore is: RQ2: Are offline and online professional networking associated with different influence factors? To identify relevant influences, we review previous work on professional offline networking and on private online networking with SNS, since work on SNS use has mostly focused on non-professional platforms such as Facebook. Influences on private SNS use might be relevant because professional SNS and private SNS mainly offer the same features and functions.

2.1 Personality Traits

To explain differences in professional offline networking between people, many researchers have focused on personality traits. When looking at the Big Five personality traits, extraversion has been found to be positively associated with professional offline networking. However, the results were more inconsistent for agreeableness, openness to new experiences, neuroticism, and conscientiousness (Bendella & Wolff, 2020; Forret & Dougherty, 2001; Wanberg, Kanfer & Banas, 2000; Wolff & Kim, 2012; van Hoye, van Hooft & Lievens, 2009). In addition, in line with the positive association of extraversion, a proactive personality, a networking personality as well as self-esteem have been found to be positively associated with professional offline networking (Bendella & Wolff, 2020; Forret & Dougherty, 2001; Lambert, Eby & Reeves, 2006; Thompson, 2005; Vandenberghe & Basak Ok, 2013).

When it comes to personality and private SNS use, again the Big Five personality traits were object of research and again the results were rather inconsistent. This time, extraversion and openness to new experiences turned out as most consistent predictors (Amichai-Hamburger & Vinitzky, 2010; Gosling, Augustine, Vazire, Holtzman & Gaddis, 2011; Muscanell & Guadagno, 2012; Ross, Orr, Sisic, Arseneault & Simmering, 2009; Ryan & Xenos, 2011; Utz, Tanis & Vermeulen, 2012; Wilson, Fornasier & White, 2010). Furthermore, a higher need to belong has been found to be associated with a higher willingness to join SNS (Gangadharbatla, 2008), the use of SNS, and the number of friends (Krasnova, Hildebrand, Günther, Kovrigin & Nowobilska, 2008; Utz, Tanis & Vermeulen, 2012). In contrast to the positive association of self-esteem with professional offline networking, findings for private SNS use turned out to be

inconsistent across different operationalizations of SNS use (Mehdizadeh, 2010, Wilson, Fornasier & White, 2010; Kalpidou, Costin & Morris, 2011; Utz, Tanis & Vermeulen, 2012). The last personality trait frequently examined with private SNS use is narcissism. Since SNS make it easy to present oneself in an idealized way to a large audience, it has been assumed that especially narcissists are attracted by SNS (Buffardi & Campbell, 2008) and that spending time on SNS increases narcissism (Gentile, Twenge, Freeman & Campbell, 2012). Narcissism has been found to be positively related to several indicators of SNS use (Buffardi & Campbell, 2008; Mehdizadeh, 2010) but it has also been shown to be unrelated to the number of friends (Utz, Tanis & Vermeulen, 2012).

There is also recent research on how personality traits are associated with professional SNS use. There is first evidence that extraversion, openness, and emotional stability are related to using professional SNS (Buettner, 2016; Davis et al., 2020). Brandenberg, Ozimek, Bierhoff, and Janker (2018) discovered a negative association of self-esteem and XING usage indicating that professional SNS use and professional networking should not be equated.

2.2 Motivation and Strategic Factors

In addition to global personality traits, other work-related influence factors have been researched, such as (protean) career orientation. A longitudinal study by Waters, Brisco, Hall, and Wang (2014) showed that protean career orientation was related to professional offline networking as a job search method. Moreover, protean career orientation was positively associated with proactive career behaviors including networking (Herrmann, Hirschi & Baruch, 2015), and career self-management behaviors also including networking (De Vos & Soens, 2008). Furthermore, especially for knowledge workers (Hube, 2005) whose daily work is characterized by non-routine but variable and complex tasks, professional networking can be essential even for daily business. Thus, people's proportion of knowledge work needs to be accounted for. In a literature review, Porter and Woo (2015) summarized that "existing networking studies suggest that one networks for three major professional purposes: work performance, career development, and job search" (Porter & Woo, 2015, p. 1495). Notice that these are all explicit motivations. Wolff, Weikamp, and Batinic (2018) in contrast, examined the influence of implicit motivations (i.e. need for power, need for achievement, and need for affiliation) on six types of professional offline networking: building, maintaining, and using contacts, which can each happen internally and externally of one's own organization. While need for achievement was positively associated with all six types of networking, need for

affiliation was only positively associated with building contacts both internally and externally. Need for power was positively associated with using contacts within one's own organization but not with any of the other forms of professional networking.

When considering career orientation and need for power as factors that influence professional networking, previous career and power achievements might also have an influence. In business contexts, career and power achievements can easily be identified by the hierarchy level someone holds. In 1993, Michael and Yukl investigated the networking behavior of managers. They discovered a positive association of hierarchy level with professional networking. As hierarchy level of managers rises, networking frequency increases. The researchers thereby extended the findings of Luthans, Hodgetts, and Rosenkrantz (1988), who identified networking as one of the activities managers routinely engage in. Forret and Dougherty (2001) replicated Michael and Yukl's (1993) findings also including non-managers. They demonstrated that hierarchy level was a significant positive predictor of networking and concluded that as one's hierarchy level increases, so do work expectations of them, which in turn motivates them to build more ties to (relevant) others. Hence, hierarchy level needs to be controlled for as well.

When it comes to private SNS use and motivational and strategic factors, impression management behaviors (Goffman, 1961) need to be considered. Research on whether users present themselves in an idealized or an authentic way revealed mixed results. Studies relying on self-report have often found that participants claimed to use idealized presentations of themselves (Brivio & Ibarra, 2009; Manago, Graham, Greenfield & Salimkhan, 2008; Rosenberg & Egbert, 2011). On the other hand, studies comparing self-report with impressions formed by strangers showed that SNS profiles rather represent users' real and authentic selves. Here, profile owners first had to describe themselves twice, one time in an authentic and one time in an idealistic way. Meanwhile, strangers evaluated the personality of the profile owners by only looking at the SNS profile. When the evaluations of the personalities were compared with the two self-descriptions, the researchers showed that not only were the evaluations similar to the authentic description rather than to the idealistic description, but these evaluations were also similar between different observers (Back et al., 2010; Gosling, Gaddis & Vazire, 2007; Kluemper & Rosen, 2009; Kluemper, Rosen & Mossholder, 2012). Moreover, there is one study by Sievers, Wodzicki, Aberle, Keckeisen, and Cress (2015) who applied the latter method to the professional SNS XING, demonstrating that people present themselves rather authentically

on XING. The degree of idealized self-presentation is also limited on SNS because besides self-generated information, there is also other-generated information (e.g. posts by friends on someone's timeline) and system-generated information (e.g. the display of friend connections) which is more difficult to manipulate (Walther, van der Heide, Hamel & Shulman, 2009). System-generated information such as the display of connections could strategically be used to showcase one's network of important people. In other words, the name dropping that happens in offline contexts is now permanently accessible and visible for everyone who has a profile on the same SNS.

2.3 Affective Influence Factors

The last group of influence factors previously investigated are affective influences. Wanberg, Kanfer, and Banas (2000) for example discovered that feeling comfortable with networking leads to more networking as networking comfort was the largest positive predictor when tested alongside the Big Five. In addition, Casciaro, Gino, and Kouchaki (2014) examined the feeling of dirtiness. According to the authors, networking for business purposes and personal gain might contradict one's sense of ethics. Individuals may think that they only "use" those other people and as a result felt "dirty". They found evidence that participants indeed felt dirty when they had to recall a planned networking scenario compared to an unintentional networking scenario. This can influence people's networking behavior as they might try to avoid that negative feeling by not engaging in professional networking. Another example is a study by Walter, Levin, and Murnighan (2015). The researchers asked MBA students to reconnect with two people they had not spoken to in at least three years and ask them for their help with a work project. Participants were rather reluctant, felt anxious, and as a result mainly chose contacts whom they knew well in the past, rather than contacts they attributed the most value to. The authors concluded that although participants were able to identify valuable candidates, they chose to contact less valuable people they knew well to avoid anxiety.

Finally, the last pieces of evidence that are considered in this article are affective influence factors online. There are several theoretical considerations about how computer-mediated communication, SNS use, or internet use in general affect people's social relationships. On one side of the spectrum is the displacement hypothesis from Kraut et al. (1998) that states that time spent online cannot be used as time spent with family and friends, resulting in fewer and weaker social relationships. Four years later, Kraut et al. (2002) revisited this hypothesis, stating that people who do already have strong relationships offline will also have strong relationships

online; people who struggle to have strong relationships offline, on the other hand, will also struggle online. The hypothesis is called the rich-get-richer or social enhancement hypothesis (SEH). On the other side of the spectrum is the social compensation hypothesis (SCH) from McKenna and Bargh (1999). This hypothesis states that people who have problems in forming relationships offline, especially anxious and shy people, can use the internet to compensate for their offline reticence and form relationships online. Since restraining (affective) influences do not apply as much online as they do offline, those people benefit from the online environment in a poor-get-richer-sense.

Zywica and Danowski (2008) found evidence for both the rich-get-richer (SEH) and the poor-get-richer (SCH) hypotheses as they apply to different sets of people. In addition, Rice and Markey (2009) assessed participants' anxiety after a 15 minutes conversation with another person that was either computer-mediated with an instant messaging tool or face-to-face and showed that people reported less anxiety in the computer-mediated condition than in the face-to-face condition. Also, Weidman et al. (2012) identified that people high in anxiety reported more comfort online and less comfort offline than people low in anxiety. Finally, Shaw, Timpano, Tran, and Joormann (2015) discovered that people with greater social anxiety symptoms generally spent more time on Facebook.

2.4 Summary and Present Research

To sum up, there is a rich set of potential influence factors when bringing together research on professional offline and private online networking. Personality traits have intensively been examined in both fields. Extraversion turned out as important predictor in both fields, whereas the results for other personality traits were less consistent. Motivational and strategic factors have also been studied in both fields. However, work on professional offline networking has looked at career-specific motivations, whereas work on private SNS use rather focused on impression management. Affective influence factors have been investigated in both domains. However, the focus of the research differed. In the field of professional offline networking researchers focused on whether affective influences were associated with networking, whereas in the field of private online networking researchers focused on whether (negative) affective influences could be overcome in online settings. Considering that anxiety and the feeling of dirtiness prevented people from networking offline, the most interesting hypothesis concerning differences between professional offline and online networking is the social compensation

hypothesis. In online settings those negative affective influences might not apply as strongly as they do offline.

Moreover, during our literature review, we found indications for one potential influence factors, that has not been systematically studied before: whether people know that networking can be beneficial for their professional lives. A variety of self-help books and articles try to advise people how to business network and inform about the benefits of business networking. However, the relation of knowing about the benefits of networking and actual networking behavior has never been investigated. Additionally, students who have not yet started their careers often do not entirely understand the value of networking and misinterpret professional networking as "asking special favors from others to gain an unfair advantage" (De Janasz & Forret, 2008, p. 635). These authors created and evaluated four exercises to train students in their networking abilities and inform them about the benefits of business networking. They demonstrated that after the training many students did change their minds and understood the concept and the benefits of professional networking. Hence, it is interesting to see how people's knowledge about the benefits of networking is associated with their networking behavior.

Also, we modified two factors slightly. When it comes to narcissism, often a distinction between grandiosity and entitlement is made. Especially in the realm of networking for professional success and advancement, there might be people who want to gain an unfair advantage. Networking could also be influenced by a sense of entitlement as some people might think that they are entitled to have important and influential contacts in their business networks that can help them with their own professional advancement. Second, as the name suggests, sociability is a major element of *social* networking sites. As extraversion turned out as significant predictor of both professional offline networking and private online networking, we assessed the feeling of sociability, a closely related construct. According to Ellison and Boyd (2013, p. 160f.), "the implicit role of communication and information sharing has become the driving motivator for participation." Moreover, connecting with other people offline by talking, hanging out, and getting along is a social activity. Hence, the feeling of sociability could influence people's professional networking.

In the present study, we want to examine whether various influence factors are differentially associated with offline and online networking. To do so, we build on the identified factors. As we combine influences that come from two unrelated research domains, that have mostly been

investigated independently, or have never been investigated before, the study is exploratory[1]. We investigate ten influencing factors. More specifically, these factors were career orientation, friendship orientation, impression management, entitlement, knowing about the benefits, networking comfort, the feeling of dirtiness, the feeling of sociability, and finally the feeling of anxiety. The feeling of anxiety was split into anxiety towards unknown people and anxiety towards high-status people, as professional networking often involves contacting individuals someone has not met before and might be on higher hierarchy levels.

3. Methodology

3.1 Procedure and Sample

In December 2017, an online survey was distributed via Prolific, an English-speaking platform for paid participants. Consequently, participants were mainly British and American. The sample (N = 326) consisted of people with a mean age of 37 years (SD = 10.75, *median* = 36, ranging from 21 to 75 years). Gender was slightly unbalanced with 42 percent male and 56 percent female participants (2 percent did not reveal their gender). Participants either worked within an organization (283 participants) or were self-employed (34 participants). Also, nine participants were currently unemployed. Mean tenure for employees was six years (SD = 6.06, *median* = 4); mean tenure for self-employed participants was 7.2 years (SD = 6.04, *median* = 6). Most of the people had an account on the professional SNS LinkedIn (89 percent). Only eight percent did not have an account on any professional SNS. Nearly 50 percent held a bachelor's degree, 22 percent a master's degree, and five percent were Doctors of Philosophy.

3.2 Dependent Variables

We assessed four networking types as dependent variables. Two of these were offline networking types, namely intra- and extra-organizational networking. We focused on the sub-dimensions of building a network and used the three building items from the short scale from Wolff, Spurk, and Teeuwen (2015) in their English translation from Wolff, Schneider-Rahm, and Forret (2011). The other two dependent variables were online forms of building a network, more specifically, proactive and reactive online networking. On professional SNS, users find other users either by name search, if the person is already known from somewhere else, or by contact recommendations. *Proactive online networking* focuses on networking by sending out contact requests to other users with the help of contact recommender systems. Furthermore, on professional SNS users can receive contact requests from other users. Unlike in offline settings,

[1] The study has been pre-registered. Materials can be found at: https://osf.io/sfc62/?view_only=9dbc1047a99b47b4bd043674a7555698

people can decide whether to accept or reject the request. *Reactive online networking* therefore means networking by accepting contact requests from others. All four networking types focused on the building of new contacts either offline or online.

The dependent variables were assessed with 5-point Likert scales: *Intra-organizational offline networking (building)*: 3 items (α = 0.69; example item: "I use company events to make new contacts") and e*xtra-organizational offline networking (building)*: 3 items (α = 0.74; example item: "I use business trips or training programs to build new contacts") with items from the short scale from Wolff, Spurk, and Teeuwen (2015) in their English translation from Wolff, Schneider-Rahm, and Forret (2011). *Proactive online networking*: 7 items (α = 0.89; example item: "I like to act on contact recommendations and send a contact request to the person recommended") and *reactive online networking*: 6 items (α = 0.85; example item: "I like receiving contact requests as they lead to connections with new people") with self-created measures. These new items reflect how people relate and react to contact recommendations and contact requests. Both scales have been analyzed with exploratory and confirmatory factor analyses to test for reliability, leading to the exclusion of two items for each of the two scales.

3.3 Independent Variables

All independent variables were assessed with 5-point Likert scales, using previously established scales by other researchers (if available) that have been slightly adapted to the context. Short scales were combined to assess every variable with at least five items; long scales were shortened by excluding very similar items for consistency concerning scale length and to prevent participants from losing attention. The two self-created scales have been analyzed with exploratory and confirmatory factor analyses to test for reliability. No items were excluded.

We chose the following scales: *Career orientation*: 6 items (α = 0.77; example item: "Even when completing current tasks, I always have my career advancement in mind") with a scale by Hippler and Krüger (2014). *Friendship orientation*: 6 items (α = 0.85; example item: "It is important for me to hang out with friends regularly.") with Randel and Ranft's (2007) three item co-worker friendship orientation scale and three items of Pöhlmann and Brunstein's (1997) affiliation scale. *Knowing about the benefits*: 8 items (α = 0.89; example item: "A network of people can help to get new career opportunities") with a self-created measure. *Impression management*: 6 items (α = 0.73; example item: "I let people know of my accomplishments") with a scale by Bolino and Turnley (1999). *Entitlement*: 7 items (α = 0.87; example item: "I

deserve more things in my professional life than my coworkers do") with a scale by Campbell, Bonacci, Shelton, Exline, and Bushman (2004). *Anxiety towards unknown people*: 7 items (α = 0.92; example item: "I have difficulty talking with people I have not met before") and *anxiety towards high-status people*: 6 items (α = 0.86; example item: "I have difficulty talking with people higher in hierarchy") with scales from Mattick and Clarke (1998). *Feeling of dirtiness*: 6 items (α = 0.84; example item: "When I engage in networking behavior, I feel inauthentic") with a scale by Casciaro, Gino, and Kouchaki (2014). *Feeling of sociability*: 6 items (α = 0.87; example item: "When I engage in networking behavior, I feel outgoing") with a self-created measure in the style of the feeling of dirtiness scale. *Networking comfort*: 5 items (α = 0.76; example item: "I am comfortable asking previous coworkers or acquaintances for their assistance in my current job.") with a scale by Wanberg, Kanfer, and Banas (2000).

3.4 Control Variables

We controlled for two aspects: The first one was the extent to which participants were knowledge workers. Especially for knowledge workers who work in a boundaryless or protean career environment, networking can be important even for daily working tasks. Hence, working in a knowledge worker profession could influence professional networking. Being a knowledge worker was assessed with a scale by Hube (2005): *knowledge worker*: 4 items (α = 0.64; example item: "I always have to extend, adjust, and revise my knowledge"). The second control variable was participants' hierarchy level. We used hierarchy level as quasi-numeric variable from 1 (no managerial responsibility), 2 (managerial responsibility for 1-5 people), 3 (for 6-10), 4 (for 11-20), 5 (for 21-50) to finally 6 (for more than 50 people), as hierarchy level influenced professional networking in previous studies.

4. Results

4.1 Research Question One

Descriptive statistics and a correlation matrix of all dependent and independent measures can be seen in Table 1. To answer the first research question (Is there a difference between offline and online professional networking in terms of intensity?), mean values of the four different networking types were compared. Results of a within-subjects analysis of variance (ANOVA) showed that participants did not differ significantly across the four types of networking ($F(3,1296) = 1.72$, *n.s.*). Even descriptively the mean values of extra-organizational offline ($M = 3.42$, $SD = 0.99$), proactive online ($M = 3.48$, $SD = 0.84$), and reactive online ($M = 3.49$,

variable		*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
networking type																
1	intra-organizational offline	3.72	0.80													
2	extra-organizational offline	3.42	0.99	0.50***												
3	proactive online	3.48	0.70	0.40***	0.22***											
4	reactive online	3.49	0.73	0.26***	0.13*	0.53***										
influence factors																
5	career orientation	3.49	0.81	0.29***	0.27***	0.28***	0.19***									
6	friendship orientation	3.63	0.81	0.33***	0.28***	0.33***	0.20***	0.33***								
7	knowing about the benefits	4.14	0.58	0.43***	0.34***	0.40***	0.32***	0.35***	0.44***							
8	impression management	2.94	0.77	0.17**	0.11	0.20***	0.12*	0.45***	0.27***	0.16**						
9	entitlement	2.67	0.85	0.12*	0.14**	0.20***	0.11	0.33***	0.16**	0.09	0.44***					
10	anxiety unknown people	2.72	1.01	-0.44***	-0.29***	-0.20***	-0.07	-0.19***	-0.31***	-0.28***	-0.03	-0.10				
11	anxiety high-status people	2.42	0.92	-0.34***	-0.21***	-0.12*	-0.03	-0.15**	-0.20***	-0.21***	0.07	0.00	0.70***			
12	feeling of dirtiness	1.81	0.75	-0.42***	-0.28***	-0.36***	-0.26***	-0.22***	-0.24***	-0.32***	-0.02	-0.03	0.42***	0.36***		
13	feeling of sociability	3.77	0.74	0.53***	0.39***	0.49***	0.41***	0.36***	0.46***	0.47***	0.17**	0.18**	-0.47***	-0.33***	-0.62***	
14	networking comfort	3.43	0.80	0.27***	0.25***	0.17**	0.16**	0.18**	0.37***	0.27***	0.04	0.06	-0.40***	-0.39***	-0.35***	0.41***

Table 1: Descriptive statistics and correlation matrix of all dependent and independent measures. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

SD = 0.82) networking were nearly the same. Only intra-organizational offline networking (*M* = 3.72, *SD* = 0.80) had a slightly higher mean value. In a second step, we conducted a k-means cluster analysis to identify different types of networkers. We used all four networking types as basis for the analysis. As a scree plot did not show substantial evidence on how many clusters to calculate, we looked at a clustergram visualizing the distance between the means of the clusters depending on the number of clusters (Schonlau, 2002).

cluster no.	cluster name	*n*	*M (SD)* internal offline	*M (SD)* external offline	*M (SD)* proactive online	*M (SD)* reactive online
1	minimal networkers	37	2.44 (0.62)	1.98 (0.71)	2.57 (0.76)	2.86 (0.73)
2	mainly offline networkers	85	3.71 (0.63)	3.71 (0.57)	2.79 (0.76)	2.69 (0.66)
3	mainly online networkers	85	3.55 (0.63)	2.64 (0.69)	3.73 (0.41)	3.90 (0.47)
4	heavy networkers	119	4.26 (0.50)	4.20 (0.47)	4.08 (0.46)	3.96 (0.54)

Table 2A: Overview of the four clusters of networkers with mean values and standard deviation for the four networking types. A one-way MANOVA with the four networking types as dependent variables and the cluster variable as independent variable shows a significant difference for all networking types. MANOVA overall: $F(3,322) = 67.25$, $\eta^2 = 0.46$, $p < .001$. Individual results for intra-organizational offline: $F(3,322) = 96.31$, $\eta^2 = 0.47$, $p < .001$; extra-organizational offline: $F(3,322) = 200.01$, $\eta^2 = 0.65$, $p < .001$; proactive online: $F(3,322) = 116.86$, $\eta^2 = 0.51$, $p < .001$; reactive online: $F(3,322) = 107.65$, $\eta^2 = 0.50$, $p < .001$.

cluster no.	cluster name	*M (SD)* career orientation	*M (SD)* friendship orientation	*M (SD)* impression	*M (SD)* entitlement	*M (SD)* knowing benefits
1	minimal networkers	3.11 (0.90)	3.21 (1.01)	2.75 (0.67)	2.47 (0.80)	3.67 (0.79)
2	mainly offline networkers	3.35 (0.72)	3.46 (0.70)	2.81 (0.69)	2.54 (0.75)	3.98 (0.56)
3	mainly online networkers	3.37 (0.77)	3.53 (0.81)	2.96 (0.83)	2.66 (0.80)	4.14 (0.46)
4	heavy networkers	3.80 (0.79)	3.96 (0.70)	3.08 (0.79)	2.84 (0.95)	4.40 (0.46)

cluster no.	cluster name	*M (SD)* anxiety unknown	*M (SD)* anxiety high-status	*M (SD)* feeling of dirtiness	*M (SD)* feeling of sociability	*M (SD)* networking comfort
1	minimal networkers	3.53 (0.79)	2.99 (0.91)	2.48 (0.79)	2.96 (0.65)	2.94 (0.86)
2	mainly offline networkers	2.72 (0.91)	2.39 (0.89)	1.95 (0.80)	3.52 (0.66)	3.39 (0.73)
3	mainly online networkers	2.81 (0.97)	2.44 (0.91)	1.80 (0.72)	3.78 (0.68)	3.38 (0.78)
4	heavy networkers	2.40 (1.03)	2.26 (0.90)	1.50 (0.54)	4.20 (0.54)	3.64 (0.77)

Table 2B: Overview of the four clusters with respect to the mean values of the ten influence factors. A one-way MANOVA with the ten influence factors as dependent variables and the cluster variable as independent variable shows a significant difference for all ten influence factors. MANOVA overall: $F(3,322) = 4.66$, $\eta^2 = 0.13$, $p < .001$; Individual results for career orientation: $F(3,322) = 10.65$, $\eta^2 = 0.09$, $p < .001$; friendship orientation: $F(3,322) = 12.70$, $\eta^2 = 0.11$, $p < .001$; impression management: $F(3,322) = 2.98$, $\eta^2 = 0.03$, *n.s.*; entitlement: $F(3,322) = 3.01$, $\eta^2 = 0.03$, *n.s.*; knowing the benefits: $F(3,322) = 21.56$, $\eta^2 = 0.17$, $p < .001$; anxiety unknown: $F(3,322) = 13.31$, $\eta^2 = 0.11$, $p < .001$; anxiety high-status: $F(3,322) = 6.28$, $\eta^2 = 0.06$, $p < .001$; feeling of dirtiness: $F(3,322) = 20.66$, $\eta^2 = 0.16$, $p < .001$; feeling of sociability: $F(3,322) = 43.89$, $\eta^2 = 0.29$, $p < .001$; networking comfort: $F(3,322) = 8.04$, $\eta^2 = 0.07$, $p < .001$.

It showed that with more than four clusters, the mean values of two (sometimes even three) clusters became so close that their individual existence could not be justified. Hence, we decided to calculate four clusters. The cluster analysis revealed the following four clusters: Cluster one (n = 37) contained the minimal networkers with low mean values for all four networking types. Cluster two (n = 85) contained the mainly offline networkers with higher values for the two offline networking types and lower values for the two online networking types. Cluster three (n = 85) contained the mainly online networkers with lower mean values for the two offline networking types and higher mean values for the two online networking types. Finally, cluster four (n = 119) contained the heavy networkers with all four networking types having high mean values. The four clusters and the mean values of the ten influence factors per cluster can be seen in Tables 2A and 2B.

4.2 Research Question Two

To answer the second research question (Are offline and online professional networking associated with different influence factors?), we calculated linear mixed model regression analyses to account for the hierarchical structure of the data (four networking types nested within participants). As dependent variable we used the value of the four networking types combined into a single variable. To do so, we restructured the data set from wide format (one row per participant) into long format (four rows per participant, one for each type of networking) and built a new variable networking category (online vs. offline, collapsing across the respective two subscales). A significant interaction between networking category and a predictor indicates a differential impact of this variable for offline and for online networking. All continuous independent variables were mean centered prior to analysis (Aiken & West, 1991). In the first model, we used the two control variables and the ten influence factors as predictors. In a second step, interaction terms between networking category (offline vs. online) and influence factors were added to the model.

Despite all the noteworthy positive and negative correlations between the influence factors and the four networking types (cf. Table 1) as model 1 in Table 3 shows, almost all influences were close to zero. Only the two predictors of knowing about the benefits and the feeling of sociability showed noticeable values. When in model 2 interaction terms were added, the results showed that anxiety towards unknown people interacted with the networking category. Again, all other interactions were rather irrelevant as estimate values were rather small. For most influences the effect on networking was the same for offline and online networking.

	model 1		model 2	
predictor	**B**	**SE**	**B**	**SE**
intercept (offline networking)	3.54 ***	0.03	3.53 ***	0.03
online networking	-0.06	0.04	-0.04	0.04
control variables				
knowledge worker	0.09 *	0.04	0.08 *	0.04
hierarchy level	0.08 ***	0.02	0.08 ***	0.02
influence factors				
career orientation	0.06	0.04	0.08	0.05
friendship orientation	0.01	0.04	0.02	0.05
knowing about the benefits	0.25 ***	0.05	0.26 ***	0.07
impression management	0.05	0.04	0.04	0.05
entitlement	0.02	0.04	0.01	0.04
anxiety towards unknown people	-0.04	0.04	-0.13 **	0.04
anxiety towards high-status people	-0.00	0.04	-0.03	0.05
feeling of dirtiness	-0.08	0.05	-0.06	0.06
feeling of sociability	0.31 ***	0.06	0.26 ***	0.07
networking comfort	0.02	0.04	0.02	0.05
interaction terms				
online networking X career orientation			-0.07	0.07
online networking X friendship orientation			-0.02	0.07
online networking X knowing about the benefits			-0.01	0.09
online networking X impression management			0.02	0.07
online networking X entitlement			0.02	0.06
online networking X anxiety towards unknown people			0.25 ***	0.07
online networking X anxiety towards high-status people			0.07	0.07
online networking X feeling of dirtiness			-0.03	0.08
online networking X felling of sociability			0.15	0.09
online networking X networking comfort			-0.01	0.07
random effects				
σ^2	0.46		0.46	
$\tau_{00\ participant}$	0.06		0.06	
$\tau_{00\ participant.online\ networking}$	0.13		0.10	
ICC	0.11		0.12	
marginal R^2 / conditional R^2	0.31 / 0.39		0.32 / 0.40	

Table 3: Linear mixed effect models. Dependent variable: the values of the four networking types. Independent variables: networking category (offline vs. online), career orientation, friendship orientation, knowing about the benefits, impression management, entitlement, anxiety unknown people, anxiety high-status people, feeling of dirtiness, feeling of sociability, networking comfort. Control variables: knowledge worker and hierarchy level. All scales assessed with 5-point Likert scales except for hierarchy level (1-6). All scales are mean centered. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Only for anxiety towards unknown people, the effect differed between offline and online networking. Figure 1 shows that the more participants felt anxious towards unknown people the less they networked. However, this effect was stronger for offline networking than it was for online networking.

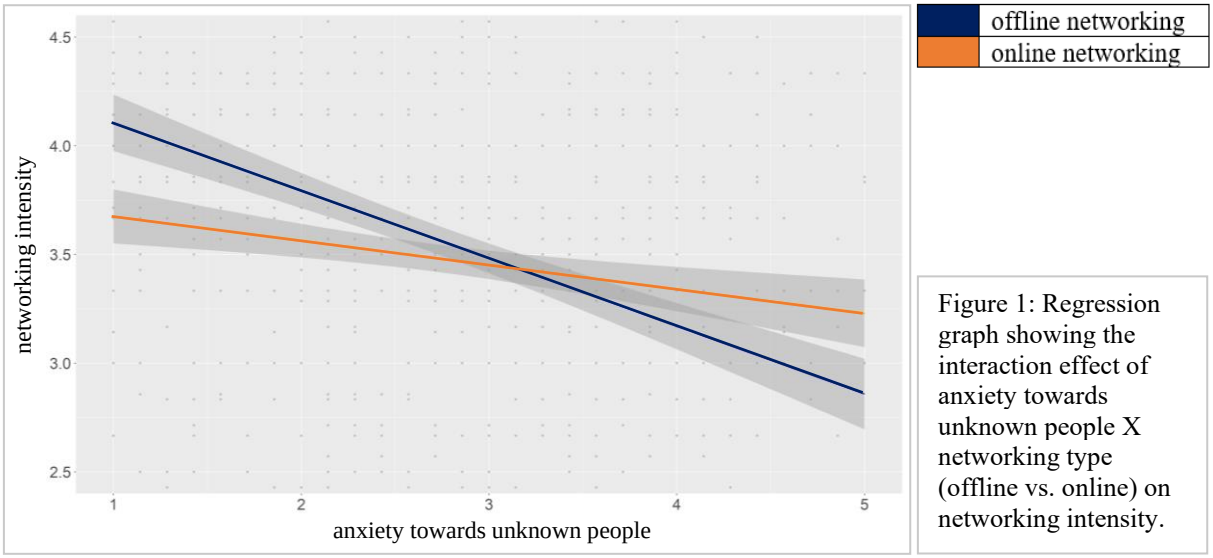

Figure 1: Regression graph showing the interaction effect of anxiety towards unknown people X networking type (offline vs. online) on networking intensity.

5. Discussion

The aim of our survey study was to compare offline and online networking in terms of intensity and in terms of influence factors. Results show that the mean values of the four networking types did not differ within participants. However, when we built clusters to categorize people into different types of networkers, we found that there were four: the minimal, the mainly offline, the mainly online, and finally the heavy networkers. Moreover, when we looked at the influence factors on professional networking, we found an effect of knowing about the benefits as well as of the feeling of sociability on professional networking offline and online. Finally, anxiety towards unknown people was the only influence that interacted with the networking category. The negative effect of anxiety towards unknown people was stronger for offline networking than it was for online networking.

5.1 Theoretical Implications

The cluster analysis of networkers revealed an interesting picture. The minimal networkers still network slightly more online than offline. They shy away most from external offline networking and are most likely to reactively accept contact requests from others online, which poses only minor obstacles. This shows that even people who do not network intensely differentiate between networking types. The heavy networkers, on the other hand, have high values on all

four networking types. Here, reactive online networking is performed the least, implying that the heavy networkers rather prefer to proactively approach others both offline and online instead of reacting to others' requests. Between the two extremes there are two clusters which can be defined as the mainly offline and the mainly online networkers. However, the mainly online networkers also have a moderate intensity of internal offline networking; these people thus shy mainly away from contacting people from other organizations offline. Often organizational culture facilitates networking with colleagues for internal information exchange and cooperation (Eckenhofer & Ershova, 2011). This preference for internal networking over external networking which is also shown by the minimal networkers has repeatedly been found by Wolff and Moser (2006; 2009; 2010). The four clusters also differ on their scores on the potential influence factors. The minimal networkers have the lowest level of knowing about the benefits while the heavy networkers have the highest level. The same is true for career orientation, friendship orientation, impression management, entitlement, networking comfort, and the feeling of sociability. On the other hand, anxiety towards unknown people and anxiety towards high-status people as well as the feeling of dirtiness show a trend in the opposite direction. For most influence factors, the mainly offline and the mainly online networkers have very similar values. Yet, they show different patterns when we look at what types of networking, they engage in.

One major element of the study was to jointly investigate the associations of ten influence factors with offline and online networking. While all the influence factors showed significant correlations with at least some types of networking (see Table 1) and are in line with previous studies in which they were tested independently (Casciaro, Gino & Kouchaki, 2014; Forret & Dougherty, 2001; Michael & Yukl, 1993; Walter, Levin & Murnighan, 2015; Wanberg, Kanfer & Banas, 2000), interestingly, when tested jointly, the results showed that only two influence factors were associated with participants' networking: the feeling of sociability and knowing about the benefits, a cognitive factor not studied before.

The relation between the feeling of sociability and networking might be rather strong as networking and connecting with people is a social process. People might either network more to feel sociable and outgoing or feel sociable and outgoing and accordingly network more. Note that sociability is closely related to extraversion. Extraverted individuals usually socialize more and extraversion turned out as most consistent predictor in prior work on both, professional offline networking and private SNS use. Besides the feeling of sociability, knowing about the

benefits of networking, a cognitive factor that has not received much attention before, significantly predicted networking. This association could be driven by two processes: It might be that people acquire that knowledge from self-help books or trainings and, as a result, network with a greater intensity. Alternatively, they might experience benefits from intense networking and, therefore, know about the benefits. These two processes might mutually enforce each other. Interestingly, the motivational factors of career orientation, friendship orientation, or impression management did neither predict offline nor online networking. A reason might be that they are more specific and might only situationally define with whom exactly people connect or what exact networking events people choose to attend, but not the general intensity of connecting with people.

Finally, for the influence factor of anxiety towards unknown people the results are in line with the social compensation hypothesis of McKenna and Bargh (1999). In online settings, the relationship between anxiety and networking is still negative but less negative than it is for offline networking. According to the social compensation hypothesis people who have difficulty in developing social contacts offline can use the internet to compensate for those limitations and form contacts online. Likewise, online networking on professional SNS can reduce the negative effect of anxiety towards unknown people on networking. Interestingly, only anxiety towards unknown people interacts with the type of networking, indicating that online environments specifically help to remove this affective barrier. However, it is not the case that sociable individuals become even more social in online environments.

5.2 Practical Implications

Based on our results, we would like to give practical implications for the two sides of the networking process: On the side of the networkers, career counselors, and self-help books we recommend informing people about the benefits of professional networking. People's knowledge about the benefits of networking was one of the two main predictors of actual professional networking. The group of the minimal networkers who network with the lowest intensity also had the lowest level of knowing about the benefits. De Janasz and Forret (2008, p. 635) previously showed that students frequently do not understand the value of networking and misinterpret networking as "gaining an unfair advantage". Only when people understand the reciprocally beneficial concept of professional networking, they can use their knowledge to intensify their networking behavior. Second, we recommend encouraging people to use online networking as a full-fledged additional networking opportunity. Especially for people who have

problems with offline networking, online networking can help to compensate for their restraints offline. Previous research has shown that people can benefit from online networking because of informational benefits, job search assistance, work-related assistance, and career sponsorship (e.g. Baruffaldi, Di Maio & Landoni, 2017; Davis et al., 2020; Nikitkov & Sainty, 2014; Utz & Breuer, 2016; 2019; Utz, 2016). Hence, both offline and online networking can have a positive impact on people's professional lives. Yet, the influence factors between the two networking types are different. This is particularly true for anxiety towards unknown people. Whiting and De Janasz (2004, p. 644) proposed that for students who have problems networking in offline settings "networking can be achieved through means other than face-to-face, such as an e-mail or letter". We highly recommend adding professional SNS to that list.

On the side of organizations, managers, and decision makers we recommend recognizing online networking as an adequate networking tool. Online networking is not to be underestimated by regarding it as inferior to offline networking. People who do not network offline do not necessarily want to avoid networking altogether. There will always be people who do not want or who simply cannot network offline. This might be the case due to anxiety and/or a lack of experience. This might also be the case because people live in areas with no networking events or conferences to attend or maybe because of a lack of resources such as money and time. However, these people can use online networking via professional SNS to compensate for their constraints offline. Hence, we recommend acknowledging the efforts of these individuals by giving them an equal chance.

5.3 Limitations of the Study

There are some limitations we want to address. The first one regards the sample. To participate, people were asked to have an account on a professional SNS, resulting in 92 percent of the sample having at least one account. The sample therefore is a rather selective sample of professional SNS users. However, to be able to compare offline and online networking the sample needed to consist of people who engage in both activities. Another limitation is that the study is based on self-report measures and has no experimental design. This means that there might be biases in responses concerning, for example, social desirability, and that the study is not able to determine causality. Consequently, results only show associations between variables. Finally, we want to mention that the self-created scales of proactive and reactive online networking do have room for improvement. We created the scales as there were no previously established scales available when we planned the study. The items of both scales

were based on statements concerning people's relation and reaction to contact recommendations and contact requests. Exploratory and confirmatory factor analyses showed that some items did not fit into the scales and were therefore excluded. Moreover, we know that scales should not be validated with the same sample used to answer our research questions. Unfortunately, it was not possible to do otherwise in this study.

5.4 Future Research

Since there is very little research on professional online networking (Blank & Lutz, 2017), future studies should take a closer look at online networking on professional SNS. Even though some influence factors can be transferred from offline to online settings, on a situational level the conditions are not the same. This study shows that there are, for example, differences concerning anxiety. All the other influence factors, however, did not show an interaction effect meaning that these influence factors apply equally to offline and online settings. Hence, there could be future research on how professional SNS could be designed to help people who might have constraints offline. Since professional networking can have an immense impact on people's professional success, investigating new opportunities of online networking on professional SNS is highly relevant. Also, online networking holds the possibility to connect with people someone has not met and might never be able to meet offline. Professional online networking can support people in the extension of their professional networks in a way that has never been possible. Since the results of this study completely rely on self-report, in future research it is necessary to investigate influence factors and people's professional online networking on a situational level with the use of (mock-up) business networking sites and contact recommendations. Moreover, future studies could include experimental or longitudinal designs to better understand the causal relation between influence factors and professional networking.

6. Conclusion

In conclusion, this study gave an overview of influence factors on professional offline networking and private online networking in a short literature review. Second, this was the first study to jointly investigate professional offline and online networking to examine if people differ in the intensity between offline and online networking. Third, this study bridges two unrelated research domains by investigating previously identified influencing factors from professional offline and private online networking to apply them both to offline and online professional networking.

ARTICLE II

How to Encourage People to Build Diverse Business Networks?

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How to Encourage People to Build Diverse Business Networks?

Abstract

With professional social networking sites (SNS) networking opportunities basically have no limits. Industry experts, influencers, and knowledgeable people from all sorts of fields and from all over the world can possibly become part of your business network, providing access to new perspectives and new information. Used wisely, these assets can enhance personal work performance and career advancement. Yet, many people are online mainly connected with others they know from their direct work environment. This can either have cognitive reasons (i.e. people do not know about the benefits of networking), affective reasons (i.e. people do know about the benefits but feel restraints to apply that knowledge), or technical reasons (i.e. contact recommender systems are mainly based on similarity and thereby facilitate connections between similar people). Despite a lot of research concerning the influences on networking behavior, so far, there is no research investigating if people who do know that networking can be beneficial do network more. More importantly, there is no research investigating if people who know that a diverse network is important do network more diverse and whether or not affective and technical influences interfere with the relationship between knowing and doing. In an experimental study (N = 316), we examine the effects of knowledge and website functionalities on professional networking behavior to draw implications on how to improve professional SNS to encourage people to build diverse business networks. We find that people who generally know that networking is beneficial do network more. Moreover, people who know that diversity is important do network more diverse. Besides, technical features of the website (e.g. who is recommended) can influence people's networking behavior. Finally, results are discussed and implication to improve professional SNS are drawn.

1. Introduction

A long line of research concerning social capital with its three assets influence, solidarity, and information has shown that people's business networks can influence their personal work performance, career success, job search, product innovation, and creativity (Adler & Kwon, 2002; Burt, 1992; Cross & Cummings, 2004; Granovetter, 1973; Sparrowe, Liden, Wayne & Kraimer, 2001). Both self-report-based studies and social-network-analyses-based studies came to the conclusion that people's professional lives benefit from their personal business networks. In addition, network diversity is key. When it comes to product innovation and creativity, a diverse network that provides access to a rich set of information and new perspectives is most

beneficial (Baer, 2010; Burt, 2004; Kochan et al., 2003; Parise, Whelan & Todd, 2015). Especially for knowledge workers who rely on the combination of different views to create new ideas, methods, and approaches to the newly arising complexities of our time professional social networking sites (SNS) offer opportunities of unprecedented extent.

While in offline times you could only connect with people you came across during your work on business events, conferences, or networking events today it is possible to be connected with people you have never met before. Industry experts, influencers, and knowledgeable people from all sorts of fields and from all over the world can possibly become part of your business network and provide access to new perspectives and new information. Professional SNS such as LinkedIn or XING (in Germany) raise professional networking to a whole new level. Users create a profile to easily present their professional achievements, expertise, and skills. Furthermore, contacting someone can easily be realized with a click and messages can be reformulated repeatedly as conversations do not happen simultaneously. People cannot only proactively send out contact requests (i.e. proactive networking), they can also reactively decide whether to accept or decline contact requests from others (i.e. reactive networking). Finally, professional SNS support their users with their networking pursuits by recommending business contacts to connect with.

However, many people do not make use of these new possibilities and connect online mainly with people they have met offline such as from their direct work environment, colleagues, and university friends (Papacharissi, 2009; Utz & Muscanell, 2014). Professional SNS even support that behavior by usually presenting contact recommendations that are based on commonalities and similar profiles (Agarwal & Bharadwaj, 2013; Chen, Geyer, Dugan, Muller & Guy, 2009; Guy, Jacovi, Perer, Ronen & Uziel, 2010). Thus, the question is whether people do not network diverse because of cognitive reasons (i.e. people do not know about the benefits of a diverse business network) or affective reasons (i.e. people do know about the benefits but feel restraints to apply that knowledge). Moreover, would professional SNS users network more diverse when contact recommendations presented a more diverse set of people?

The influences on (mainly offline) professional networking behavior have been researched for years. Many scholars investigated the influences of personality traits (e.g. the Big Five: Fang et al., 2015; Kalish & Robins, 2006; Wolff & Kim, 2012, self-monitoring: Mehra, Kilduff & Brass, 2001; Oh & Kilduff, 2008; Sasovova, Mehra, Borgatti & Schippers, 2010, and self-esteem: Forret & Dougherty, 2001), as well as affective influences (e.g. networking comfort feeling:

Wanberg, Kanfer & Banas, 2000, the feeling of dirtiness: Casciaro, Gino & Kouchaki, 2014, or the feeling of anxiety: Baumann, Utz & Kirsch, 2018; Walter, Levin & Munighan, 2015). These characteristics, however, can only explain why business networking is easier for some people and harder for others when they are already networking. Only a few scholars, on the other hand, focused on why people network in the first place. "Existing networking studies suggest that one networks for three major professional purposes: work performance, career development, and job search" (Porter & Woo, 2015, p. 1495). Shea and Fitzsimons (2016), for example, found that people with a strong career goal network more within their company than people with a strong friendship goal. But when a strong career goal leads to more networking, people first and foremost need to know that networking is a tool for personal career advancement.

Interestingly, despite the fact that there are hundreds of guidebooks and articles that try to inform people about the benefits of business networking (Byham, 2009; Cross & Thomas, 2011), there is little research on whether or not and how knowledge about the benefits of professional networking influences actual networking behavior. Furthermore, there is to our knowledge no research that jointly investigates cognitive and affective influences to see how they influence or rule out each other. Since the benefits of a business network do not only arise from size but more importantly from the composition of one's network the question is whether or not general knowledge about the benefits of networking influences quantity and specific knowledge about network diversity influences the quality of networking.

Presumably, there are two scenarios possible: Either there is a direct effect of knowledge on actual networking behavior or there is a so-called knowing-doing-gap meaning that people indeed know about the importance of networking but do not apply this knowledge because of other (affective) reasons (Pfeffer & Sutton, 2000). When we know how knowledge, affective, and technical influences guide actual networking behavior we can use these findings to improve current professional SNS to help users with their networking pursuits. Hence, in a controlled experimental set-up, we investigate the influences of differences in knowledge on actual networking behavior to draw implications on how to improve professional SNS by proving the information users need.

2. Theoretical Background and Hypotheses

Networking behavior is defined as an "individual's attempt to develop and maintain relationships with others who have the potential to assist them in their work or career" (Forret & Dougherty,

2001, p. 284). As mentioned above, it certainly matters who those others are when it comes to benefits that only derive from a diverse set of perspectives and ideas. In the following, we will explain why people do not naturally form diverse social networks (2.1), how we think knowledge can help to overcome that problem (2.2) and how technical features of the website (e.g. interface design, recommender system design) might help to overcome that problem as well as reduce affective influences (2.3).

2.1 The Homophily Principle versus Diversity

One of the basic principles that influences with whom we build social relations is the homophily principle. It states that "a contact between similar people occurs at a higher rate than among dissimilar people" because we tend to surround ourselves with people that are similar to us concerning "sociodemographic, behavioral, and intrapersonal characteristics" (McPherson, Smith-Lovin & Cook, 2011, p. 415f.; Ahuja, Soda & Zaheer, 2012; Ibarra 1992; Ingram & Morris, 2007). "Homophily in ethnicity creates the strongest divides in our personal environments, with age, religion, education, occupation, and gender following in roughly that order" (McPherson, Smith-Lovin & Cook, 2001, p. 415). Accordingly, people's personal networks are rather homogeneous than heterogeneous. While in a private context it is perfectly fine to have relationships with others that are similar in age, interests, and hobbies, in a professional context the homophily principle is against the requirements of an eligible business network. In a professional context, namely, a diverse network that provides access to non-redundant information, different talents, perspectives, and skills is what we need (Baer, 2010; Burt, 2004; Kochan et al., 2003; Parise, Whelan & Todd, 2015).

Although it is simple to say that a diverse network is good, it is not as simple to say what diversity is. Diversity is defined as the "distribution of differences among the members of a unit with respect to a common attribute X" (Harrison & Klein, 2007, p. 1199). Diversity, therefore, is a unit-level construct. It can only describe the unit as a whole. It cannot describe differences between individuals within a unit. Additionally, diversity is attribute-specific. A unit cannot be diverse per se it can only be diverse with respect to specific attributes of the members. As a consequence, a unit can be diverse concerning one attribute and not be diverse concerning another. Besides, diversity has three distinctive types: separation, disparity and variety. Separation means that members of a unit "differ from one another in their position along a single continuous attribute on a [horizontal] continuum S". Disparity means that members of a unit "differ in the extent to which they hold or receive a share, amount, or proportion of D", a

continuous attribute on a vertical continuum. The last type is variety. Variety, other than the former two, does not stretch out on a continuum as variety means that members of a unit "differ from one another qualitatively – that is on a categorical attribute V" (Harrison & Klein, 2007, p. 1202).

Regarding professional networking the required diversity is variety concerning people's expertise and occupations. The most commonly used measure for diversity-as-variety is Blau's index of heterogeneity as it builds on the qualitative differences between the elements of a unit (Blau, 1977; Harrison & Klein, 2007). Its minimum occurs when every element of the unit is of the same category, its maximum occurs when every category has the same proportion as every other category in the whole unit. Blau's index, however, is sensitive to the number of different categories. The more categories there are, the higher the possible maximum. For instance, with only two categories (e.g. male and female) index values range from zero to a maximum of 0.5; with four categories (e.g. red, blue, green, and yellow) values range from zero to a maximum of 0.75. To be able to compare indices of attributes with different numbers of categories it is necessary to standardize the value by dividing it by the maximum. In the standardized form Blau's index can have values between zero and one that can be interpreted as percentage of variety with a higher value standing for more diversity. The formula to calculate the standardized index is the following:

$$B_S = \frac{1 - \sum p_k^2}{\frac{K-1}{K}}$$

Where p is the proportion of unit members of the k^{th} category to the whole and K is the number of categories.

In conclusion, the homophily principle and the diversity requirements of a business network are not reconcilable. When we follow our natural principles, we will form networks that are homogeneous. Only when we know that diversity in particular is important, we can use this knowledge to intentionally form heterogeneous networks.

2.2 Knowledge

Scientifically, knowledge is differentiated into situational, conceptual, procedural, and strategic knowledge (De Jong & Ferguson-Hessler, 1996; Renkl, 2009). In this study we use knowledge as conceptual knowledge meaning the "knowing that" something is true (e.g. facts and relations) in contrast to the "knowing how" of procedures and processes (e.g. playing an instrument, riding a bike). We split knowledge into two types: (1) general knowledge and (2) specific knowledge. General knowledge is when people rather on a surface level understand the concept that

networking can be beneficial for their personal work performance and career advancement. Specific knowledge is when people on a deeper or more profound level understand what kind of networking exactly (i.e. diverse networking) is beneficial for their personal work performance and career advancement. We assume that when people generally and specifically know about the benefits of networking this will influence their networking behavior. We propose the following hypotheses: H1: People who know that professional networking is beneficial for their work performance and career advancement *in general* do network *more* proactively and reactively. H2: People who *specifically* know that a *diverse network* is beneficial for their work performance and career advancement do network *more diverse* concerning expertise and occupation.

2.3 Affective and Technical Influences

Even when people both generally and specifically know about the benefits of networking, there might be other influences that interfere with the direct effect of knowledge on networking behavior. For example, in previous studies researchers found a positive influence of a networking comfort feeling (Wanberg, Kanfer & Banas, 2000), a negative influence of the feeling of dirtiness (Casciaro, Gino & Kouchaki, 2014), as people feel morally reprehensible when they network for their own advancement and a negative influence of the feeling of anxiety (Walter, Levin & Munighan, 2015). Moreover, in a previous survey study the authors found a negative influence of anxiety towards unknown people on networking intensity (Baumann, Utz & Kirsch, 2018). They specifically focused on anxiety towards unknown people as professional networking online with contact recommendations most likely involves others one has never met before. As a result, affective (or any other additional) influences might create a so-called "knowing-doing-gap" (Pfeffer & Sutton, 2000), comparable with the phenomenon of people knowing that exercising is healthy and knowing how to exercise but still not exercising regularly (Kuwabara, Hildebrand & Zou, 2016). In this study we once again want to test for anxiety towards unknown people to see whether networking behavior is rather driven by cognition or affect. Furthermore, we want to examine how technical functionalities and features of the website might influence people's behavior as we think that affective influences can be weakened by technical elements.

First, we generally assume a difference between proactive and reactive networking. When people "only" have to accept contact requests from others affective influences might not apply as strongly as there is no need to show own initiative and one does not have to approach the

other person as one does when networking proactively. Plus, when people answer contact requests and consequently experience that sending contacts requests is very common within the professional SNS they might feel fewer restraints when they network themselves. Consequently, we expect the following order effect: H3: People who start with reactive networking network more in the subsequent proactive condition than people network proactively who start with proactive networking.

To further explore the role of affective influences, we contrasted the usual networking condition with a "bookmark" condition in which people could only bookmark the contacts they found suitable for their business networks. In the bookmark condition, affective influences should have no effect, and people should merely on a rational basis select the most helpful contacts for their networks. This allows us to test whether people know that a diverse set of contacts would be helpful. Hypotheses four to six therefore are: H4: People in the "bookmark" condition feel less anxiety than people in the "connect" condition. H5: People in the "bookmark" condition network more than people in the "connect" condition. H6: People in the "bookmark" condition network more diverse than people in the "connect" condition concerning expertise and occupation.

Finally, we would like to take a closer look at the contact recommender systems of professional SNS. Usually, contacts are recommended based on commonalities and similarity to users' profiles (Agarwal & Bharadwaj, 2013; Chen et al., 2009; Guy et al., 2010). As we know, most professional SNS users are online connected with people they have met offline such as from their direct work environment, colleagues, and university friends (Utz & Muscanell, 2014). Maybe people connect online with others they already know from the offline world and with others who are similar to them because then affective influences are not as strong as when connecting with dissimilar strangers. So, the question is what happens when professional SNS recommend mainly dissimilar business contacts? Will users connect with less people or will they connect with the same number and as a result end up with a more diverse set of people? Based on current user behavior on professional SNS we expect the following: H7: When people are presented with mainly dissimilar contact recommendations and requests, they network less than when they are presented with a mixture of similar and dissimilar contact recommendations and requests.

3. Methodology

3.1 Design and Sample

The study had a 2x2x2 experimental design. The first experimental factor was the order of networking with one group starting with proactive networking followed by reactive networking (i.e. *pro first*) and the other group starting with reactive networking followed by proactive networking (i.e. *re first*). The second experimental factor was the mode of proactive networking with one group being told that they were actually sending out contact requests (i.e. *connect*) and the second group being told that the site was currently running a software update so that they were only able to bookmark the recommended contacts (i.e. *bookmark*). The last experimental factor was the compilation of the contact recommendations and requests that were presented. One group was presented with a balanced mixture of similar and dissimilar ones (i.e. *similar*) the other group was presented with mainly dissimilar ones (i.e. *dissimilar*) concerning expertise and occupation. Similarity was defined with respect to a scenario that participants held a business degree and were themselves working in logistics. Participants were randomly assigned to one of the eight experimental conditions. Hypotheses, study design, and measures were pre-registered on aspredicted.org[2].

The sample consisted of 316 working people living in the US (37 percent) and UK (62 percent), with a mean age of 37 years (ranging from 21 to 70, *median* = 34.5, *SD* = 11.80). Gender was nearly balanced with 48 percent male participants and 52 percent female participants. To participate they needed to have an account on a business networking site such as for example LinkedIn to be familiar with how those sites work (concerning the sending and receiving of contact requests and recommendation). 74 percent of participants were employed within an organization, 16.80 percent were self-employed, and 9.20 percent were currently unemployed.

3.2 Procedure

An online survey was distributed via Prolific, a participant database where people get paid for participation. The study was created as HTML-file to implement a mock-up business networking site at two points in the questionnaire. Participants were told that the study investigated modern working life with its different aspects. Thus, the study consisted of many tasks that were only meant to distract from the real research intention such as for example questions concerning analytical thinking, concerning soft skills or classical working tasks were participants had to extract information from a diagram. Between those distractions, participants were presented with a mock-up business networking site. The business networking site presented 22 contact

[2] The study has been pre-registered: http://aspredicted.org/blind.php?x=wk3jg8

recommendations in the proactive networking condition and six contact requests in the reactive networking condition of fake people (in the following called *profiles*) (see Figure 1).

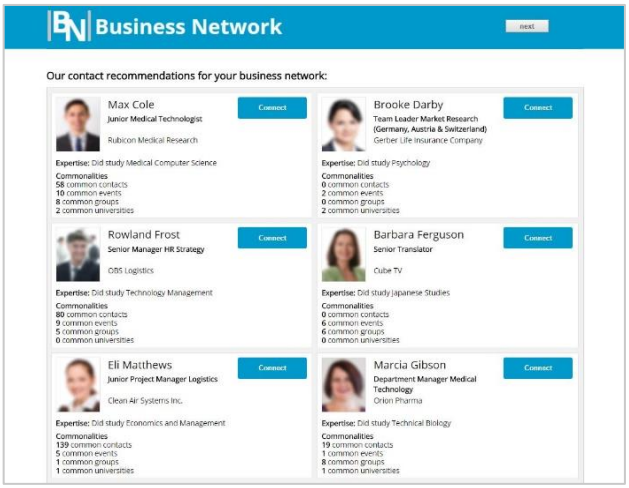

Figure 1: Screenshot of the mock business networking site in the proactive networking condition in the connect mode (presenting contact recommendations).

In total we created 164 profiles by automatically mixing together different names, study courses, jobs, and companies from a database combined with randomly assigned numbers of fake commonalities such as common contacts (between zero and 150), groups (between zero and ten), events (between zero and ten), and universities (between zero and two). The profiles then were assembled in eight *pro*-sets of 22 and eight *re*-sets of six profiles. In each case, four of the sets were *similar*-sets for the similar condition and the other four were *dissimilar*-sets for the dissimilar condition. The profile photos were randomly assigned to the profiles in each set and additionally blurred to rule out any influence. The profiles differed in their hierarchy level (junior, intermediate or senior level), their expertise (i.e. study course), their occupation (combination of job and company), and their fake commonalities with the participant. In the beginning, participants started with reading the scenario and then continued with the first set of filler tasks. The networking parts were introduced with a neutral statement that in their free time they wanted to check on their account to see who was sending them a contact request and who was getting recommended by the site. Participants did not need to network and there was no minimum time they had to wait to be able to continue to the next page. Thereby we wanted to reduce demand characteristics of the mock-up business networking site. When participants clicked on the networking buttons, feedback was shown that a contact request was sent, the person was bookmarked, or the contact request of the other one was accepted or ignored. Anxiety was each time assessed right after the networking part all other independent variables were assessed at the end of the study so participants would not get primed by the assessment.

3.3 Dependent Variables

For the dependent variables the *number of added profiles* was counted for both proactive and reactive networking. Diversity of the newly built network was calculated with Blau's index of

heterogeneity in the standardized form divided by the maximum that would have been possible. Blau's index was calculated for *expertise* and *occupation* always both for proactive networking and for reactive networking.

3.4 Independent Variables

Independent variables were assessed with 5-Point-Likert-scales: *General knowing*: 6 self-created items (Cronbach's $\alpha = 0.76$, example item: "Connecting with people now can help with personal business advancement in the future."). *Specific knowing:* 3 self-created items (Cronbach's $\alpha = 0.65$, example item: "A good business network is when the people in the network have different expertise and backgrounds."). *Anxiety towards unknown people*: 6 items (Cronbach's $\alpha_{pro} = 0.91$; Cronbach's $\alpha_{re} = 0.89$, example item: "I am at ease getting in contact with new people on business networking sites.") with an adapted scale by Mattick and Clarke (1998).

3.5 Attention and Manipulation Check

We included an attention check item in the middle of the questionnaire in the middle of a scale. Participants who failed the attention check were excluded from data analysis. Moreover, at the end of the questionnaire participants were asked how much they empathized with the scenario and whether they had the scenario in mind when they were networking. Only participants who passed the manipulation check with a score above three (on a scale from 1 to 5) were included in the analysis. The final sample consisted of 253 participants.

4. Results

4.1 Hypotheses Testing

Descriptive statistics are reported in Table 1. Interestingly, the mean values of *general knowing* and *specific knowing* are above, mean values of anxiety, on the other hand, are below the scale center. To test H1, we calculated linear regression analyses to see how people's knowledge was related to their networking behavior. *General knowing* was the predictor and *number added PRO* and *number added RE* were the respective dependent variables to see how a unit change in knowing impacts the number of added profiles proactively and reactively. For the proactive networking condition we found a significant relation between general knowing and the number added with $F(1,251) = 9.46$, $p < .01$, $R^2 = 0.03$, $B = 2.24$. For the reactive networking condition we also found a significant relation with $F(1,251) = 4.92$, $p < .05$, $R^2 = 0.02$, $B = 0.44$. Thus, when people increase by one on the general knowing scale, they on average add 2.24 more profiles proactively and 0.44 profiles reactively. As a result, H1 can be supported.

	M (SD)
dependent variables	
number added PRO	8.75 (5.70)
number added RE	4.17 (1.54)
Blau's index expertise PRO	0.69 (0.30)
Blau's index expertise RE	0.83 (0.22)
Blau's index occupation PRO	0.67 (0.32)
Blau's index occupation RE	0.77 (0.26)
independent variables	
general knowing about the benefits	4.32 (0.48)
specific knowing about the benefits	4.07 (0.71)
anxiety towards unknown people PRO	2.85 (1.08)
anxiety towards unknown people RE	2.72 (1.02)

Table 1: Descriptive statistics of all dependent and independent variables

For H2 we looked at the relation between *specific knowing* as predictor and the *diversity of expertise* and the *diversity of occupation* as dependent variables each time for proactive and for reactive networking. Results for expertise when proactively networking showed a significant effect with $F(1,239) = 8.05$, $p < .01$, $R^2 = 0.03$, $B = 0.08$. The same was true for expertise when reactively networking with $F(1,243) = 5.11$, $p < .05$, $R^2 = 0.02$, $B = 0.04$. Results for occupation when proactively networking also showed a significant effect with $F(1,239) = 6.26$, $p < .05$, $R^2 = 0.02$, $B = 0.07$. Only the effect for occupation when reactively networking was not significant with $F(1,243) = 2.17$, *n.s.*, $R^2 = 0.00$, $B = 0.03$. Hence, when people increase by one on the specific knowing scale, they network between four and eight percent more diverse. Only the diversity of occupation in the reactive networking condition was not significantly related to specific knowing. Nevertheless, H2 can be supported.

Afterwards, we calculated a 2x2x2 ANOVA to see how experimental conditions influenced people's networking behavior and to get insights into H3, H5, and H7. The dependent variable was how many people were added proactively (*number added PRO*) and the predictors were the three experimental conditions for order, mode, and similarity. There was only a main effect for networking order ($F(1,245) = 33.58$, $p < .001$). A comparison of the two experimental groups (pro first and re first) with respect to proactively added people showed that people who start with reactive networking network more in the subsequent proactive condition ($M = 10.62$, $SD = 6.09$) than people who directly start with proactive networking ($M = 6.68$, $SD = 4.40$). H3 can therefore be supported. In contrast to H5, there was absolutely no difference ($F(1,245) = 0.01$, *n.s.)* in the number of proactively added profiles between the connect ($M = 8.72$, $SD = 6.34$) and the bookmark ($M = 8.78$, $SD = 4.90$) condition. Consequently, H5 had to be rejected. In contrast to H7, there was also no effect ($F(1,245) = 0.60$, *n.s.*) of similarity on the number of proactively

added profiles (similar condition: M = 8.67, SD = 5.44; dissimilar condition: M = 8.83, SD = 5.95). So far with respect to proactive networking H7 has to be rejected. Besides, there were no interaction effects between any of the experimental conditions, with order X mode having the highest value (F(1,245) = 1.73, *n.s.*). All other values were even lower.

In a second step we calculated both a 2x2x2 ANOVA to get insights into how the experimental conditions influenced the dependent variables of diversity concerning expertise (*Blau's index expertise PRO*) and diversity concerning occupation (*Blau's index occupation PRO*) for proactive networking. Again, there were no interaction effects between the experimental conditions neither for the diversity of expertise nor for the diversity of occupation. However, there were main effects of order for both diversity concerning expertise (F(1,233) = 9.09, p < .01) and diversity concerning occupation (F(1,233) = 7.57, p < .01). When people start with reactive networking, they network more diverse concerning expertise (M = 0.74, SD = 0.27) and occupation (M = 0.72, SD = 0.28) in the subsequent proactive networking part than when they directly start with proactive networking (expertise: M = 0.63, SD = 0.33; occupation: M = 0.61, SD = 0.34). Moreover, there was a main effect for similarity both for expertise (F(1,233) = 24.62, p < .001) and for occupation (F(1,233) = 38.73, p < .001). In the dissimilar condition, participants proactively networked more diverse concerning expertise (M = 0.78, SD = 0.27) and concerning occupation (M = 0.78, SD = 0.25) than in the similar condition (expertise: M = 0.60, SD = 0.32; occupation: M = 0.55, SD = 0.34). As reported above the quantity of networking did not differ between the similar and dissimilar condition for proactive networking and as a consequence the diversity of the resulting networks concerning expertise and occupation did differ, meaning that people networked more diverse in the dissimilar condition.

Although diversity concerning expertise (M = 0.72, SD = 0.23) and concerning occupation (M = 0.68, SD = 0.30) were descriptively somewhat higher in the bookmark condition than in the connect condition (expertise: M = 0.66, SD = 0.33; occupation: M = 0.65, SD = 0.33), the main effect of networking mode was not significant neither for expertise (F(1,233) = 1.51, *n.s.)* nor for occupation (F(1,233) = 0.12, *n.s.*). Accordingly, H6 had to be rejected.

Plus, we calculated a 2x2 ANOVA with the dependent variable of *number added RE* to see how the experimental conditions of order and similarity influence reactive networking behavior (networking mode, i.e. bookmark or connect does not apply in the reactive condition). Again

there was neither an interaction effect between the experimental conditions nor was there a significant main effect of similarity ($F(1,249) = 1.35$, *n.s.*). Hence, H7 had to be equally rejected with respect to the reactive networking condition. But again there was a significant effect of networking order ($F(1,249) = 5.50$, $p < .05$) showing that people accept more contact requests reactively when they start with reactive networking ($M = 4.38$, $SD = 1.44$) than when they start with proactive networking ($M = 3.93$, $SD = 1.61$). Finally, to test H4 we compared the mean values of anxiety towards unknown people between the bookmark and the connect condition with a Wilcoxon rank-sum test to compare means of independent samples. Results showed no difference between the two proactive networking conditions ($W = 8715$, *n.s.*) as the mean values in the bookmark condition ($M = 2.95$, $SD = 1.07$) and the connect condition ($M = 2.76$, $SD = 1.09$) were nearly the same. They only differed descriptively, however, with a trend in the opposite direction as expected. Thus, H4 had to be rejected.

4.2 Exploratory Analysis

After we tested our hypotheses, we wanted to look a little deeper into the data and did some exploratory analyses. First, we found that people in general networked more reactively than proactively. As the number of options differed between proactive and reactive networking with one time 22 and the other time only six profiles, we calculated the percentage share of how many profiles were selected depended on how many were shown (i.e. *proportion of added profiles*). When comparing the *proportion of added profiles* as dependent variable in a Wilcoxon signed-rank-sum test to compare mean values of paired samples, on average participants added 39.80 percent of the 22 profiles proactively and 69.50 percent of the six profiles reactively ($V = 1835.5$, $p < .001$). Moreover, diversity concerning expertise significantly differed between the two networking types of proactive networking ($M = 0.69$, $SD = 0.30$) and reactive networking ($M = 0.83$, $SD = 0.22$) within participants ($V = 7228.5$, $p < .001$). The same was true for diversity concerning occupation between the two networking types of proactive networking ($M = 0.67$, $SD = 0.32$) and reactive networking ($M = 0.77$, $SD = 0.26$) within participants ($V = 8827$, $p < .001$). Hence, people network more and more diverse concerning expertise and occupation in the reactive condition than in the proactive condition. Interestingly, in the reactive networking condition participants ignored more contact requests when the profiles were mainly dissimilar ($M = 1.83$, $SD = 1.31$) than when the profiles were a balanced mixture of similar and dissimilar ones ($M = 1.37$, $SD = 1.28$; $W = 9517.5$, $p < .01$).

Lastly, we calculated three overall regression analyses for the *number of added profiles PRO*, the *diversity expertise PRO*, and the *diversity occupation PRO* with general knowing, specific knowing, anxiety towards unknown people, and all three experimental factors as predictors. In a second step we added an interaction term between knowing and anxiety. Results can be seen in Tables 2, 3, and 4. As the linear regression models show, networking quantity was influenced by networking order, positively by people's general knowledge and negatively by people's anxiety towards unknown people. Networking diversity, on the other hand, was both times influenced by networking order, the similarity of who was presented, and positively by people's specific knowledge but not by people's anxiety towards unknown people. Neither on networking quantity nor on networking diversity there was an interaction effect between people's knowledge and people's anxiety. Consequently, knowledge and anxiety individually influence people's networking behavior but do not reinforce or rule out each other.

	model 1		**model 2**	
predictor	**B**	**SE**	**B**	**SE**
intercept	4.88	3.28	-5.25	9.40
experimental factors				
networking order (0 = re first)	-3.85 ***	0.66	-3.90 ***	0.66
networking mode (0 = bookmark)	-0.11	0.66	-0.07	0.66
similarity (0 = dissimilar)	-0.59	0.66	-0.62	0.66
cognitive factors				
knowing general	1.90 **	0.69	4.16 *	2.08
affective factors				
anxiety towards unknown people	-0.76 *	0.31	2.80	3.11
interaction terms				
knowing X anxiety			-0.79	0.69
adjusted R^2	**0.16, $F(5,247) = 10.34$, $p < .001$**		**0.16, $F(6, 246) = 8.85$, $p < .001$**	

Table 2: Hierarchical regression analysis: Dependent variable: number added pro.
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

	model 1		**model 2**	
predictor	**B**	**SE**	**B**	**SE**
intercept	0.58 ***	0.13	0.74 *	0.31
experimental factors				
networking order (0 = re first)	-0.14 ***	0.04	-0.14 ***	0.04
networking mode (0 = bookmark)	-0.04	0.04	-0.04	0.04
similarity (0 = dissimilar)	-0.18 ***	0.04	-0.19 ***	0.04
cognitive factors				
knowing specific	0.08 **	0.03	0.04	0.07
affective factors				
anxiety towards unknown people	-0.01	0.02	-0.07	0.10
interaction terms				
knowing X anxiety			0.01	0.02
adjusted R^2	**0.15, $F(5,235) = 9.58$, $p < .001$**		**0.15, $F(6,234) = 8.02$, $p < .001$**	

Table 3: Hierarchical regression analysis: Dependent variable: diversity expertise pro.
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

	model 1		model 2	
predictor	**B**	**SE**	**B**	**SE**
intercept	0.63 ***	0.14	0.41	0.31
experimental factors				
networking order (0 = re first)	-0.13 ***	0.04	-0.13 ***	0.04
networking mode (0 = bookmark)	-0.01	0.04	-0.01	0.04
similarity (0 = dissimilar)	-0.24 ***	0.04	-0.24 ***	0.04
cognitive factors				
knowing specific	0.07 **	0.03	0.12	0.07
affective factors				
anxiety towards unknown people	-0.03	0.02	0.05	0.10
interaction terms				
knowing X anxiety			-0.02	0.02
adjusted R^2	**0.19**		**0.18**	
	$F(5,235) = 11.98$, $p < .001$		**$F(6,234) = 10.07$, $p < .001$**	

Table 4: Hierarchical regression analysis: Dependent variable: diversity occupation pro.
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

5. Discussion

Previous studies that investigated influences on networking behavior mainly focused on personality traits (Fang et al., 2015; Forret & Dougherty, 2001; Sasovova et al. 2010), networking motivations (Porter & Woo, 2015; Shea & Fitzsimons, 2016), or on affective influences (Casciaro, Gino & Kouchaki, 2014; Walter, Levin & Munighan, 2015; Wanberg, Kanfer & Banas, 2000). Research on how people's knowledge about the benefits of networking influences actual networking behavior has rather been neglected. This might be because we just assumed that people know about the benefits of networking and as a consequence act accordingly as there are hundreds of guidebooks and articles that try to advise people how to business network (Byham, 2009; Cross & Thomas, 2011). Yet, this cannot explain why people are online mainly connected with others they know from their direct work environment (Utz & Muscanell, 2014). Do all these people just not know about the benefits of networking or do they know about the benefits but do not act accordingly because of other (affective) reasons, creating a gap between knowing and doing (Pfeffer & Sutton, 2000)? This study was one of the first studies to examine how people's general and specific knowledge about the benefits of professional networking as well as the affective influence of anxiety have an effect on actual networking behavior. Moreover, this study was one of the first studies to research professional networking in a controlled experimental set-up. Furthermore, in this study we took into account how technical features of professional SNS can influence users' behavior. We begin the discussion with theoretical implications of our findings (5.1), followed by practical implications on how the results can be used to improve professional SNS as announced in the beginning (5.2), and finally we will mention strengths and weaknesses concerning internal and external validity (5.3).

5.1 Theoretical Implications

First, we did not find a gap between people's knowledge and their behavior as general knowing was directly related to networking quantity and specific knowing was directly related to networking diversity. Plus, there was no difference between the connect and the bookmark condition. If people had networked less and less diverse in the connect condition than in the bookmark condition where no other influences applied, results would have indicated that networking behavior on professional SNS was rather driven by other (affective) influences. However, no difference between the two conditions indicates that people's knowledge consistently plays a major role in who people connect with and the high mean values of the knowing scales point out that participants certainly knew about the benefits of networking. Besides, we did not find an interaction between knowledge and anxiety meaning that they do not reinforce or rule out each other. Interestingly, technical features of the website can directly influence people's networking behavior and reduce restraints towards networking. When people first saw contact requests from others, they networked more and more diverse in the subsequent proactive networking part. Additionally, when people were presented with mainly dissimilar contact recommendations, they did not network less but as they could only choose from dissimilar others, they did network more diverse. According to McPherson, Smith-Lovin, and Cook (2001) the strongest divide in our social networks is created by ethnicity, followed by "age, religion, education, occupation, and gender […] in roughly that order" (McPherson, Smith-Lovin & Cook, 2001, p. 415). As education and occupation are already at the end of the list, with regard to the homophily principle our results imply that when people are presented with a diverse set of others it can help to overcome that principle within the professional context. Hence, the rejection of H7 is rather encouraging as it leads to practical implications.

Last but not least, we would like to mention that we first considered the reactive networking part as the "easier" one. We assumed that people would network more and more diverse reactively because they feel less anxiety and less cognitive effort of choosing who to approach as they only have to accept contact requests from others. Yet, another explanation is possible. People might also network more and more diverse reactively because of politeness and because they feel the pressure to accept the requests as here for instance ignoring someone could lead to negative consequences in the future. As a result, in the reactive networking part other restraints might influence people's behavior. In future studies reactive networking could be looked at in more detail to find out if people network more and more diverse because of fewer restraints (e.g. less anxiety) or because of stronger but different restraints.

5.2 Practical Implications

The results indicate that people do know that networking in general and that diversity in specific are beneficial. Furthermore, people use this knowledge to actually network more and more diverse concerning expertise and occupation. The most interesting finding is that when presented with mainly dissimilar profiles people do not network less in quantity but more diverse in quality. Based on our findings we formulate the following recommendations to improve professional SNS: R1: Provide professional SNS users with the information that networking in general is beneficial for personal work performance and career advancement. R2: Provide professional SNS users with the information that diversity in specific is beneficial for personal work performance and career advancement. For example, give an explanation why someone is recommended (e.g. “We recommend XYZ to bring some new perspectives, new expertise, new skills into your personal business network as your network mainly consists of people with the same background or from the same business sector”). R3: In case users received contact requests, show them those requests prominently on the first page when they log in. R4: Present users with more dissimilar contact recommendations concerning expertise and occupation to trigger professional SNS users to network more diverse.

5.3 Strengths and Weaknesses

Strengths concerning internal validity are the following: First, to a great extent the questionnaire consisted of distracting filler tasks. As a result, we believe that participants did not anticipate that the study was solely about professional networking. In an earlier pre-test of the research environment we did not include filler tasks and gained the experience that this created high demand characteristics, resulting in unrealistically high numbers of sent and accepted contact requests. With the cover story of investigating a regular day in modern working life we used in this study we assume that participants felt a rather realistic experience and fewer demand characteristics and therefore were more likely to network as they would network in real life. Second, participants filled in the questionnaire completely anonymously at home and are also familiar with filling in questionnaires as they signed up for the participant database Prolific. Accordingly, we do not expect any influence of social desirability. Concerning external validity, the study sample is a strength. The sample consisted of working people, mostly employed within an organization, with a mean age of 37 years. Participants needed to have an account on a professional SNS and were therefore presumably familiar with the functionalities of such sites. Hence, participants were members of that group of people we actually wanted to investigate.

Weaknesses concerning external validity, on the other hand, are the following: First, participants were certainly aware of the fact that the professional SNS, the contact recommendations, the sending out of contacts requests and the accepting of contact requests were not real as there was no log-in necessary and they did not leave the questionnaire to go to another website. Consequently, there were no real ramifications to the professional networking. This might have influenced the amount of networking which was relatively high. Second, people had to read a scenario of holding a business degree and working in logistics. This was necessary to define the similar and dissimilar condition for the third experimental factor. However, this is another element that brings people farther away from the feeling of real networking. Working in logistics might have been hard to imagine for some participants. Maybe participants would have networked differently if they had networked for themselves. Another weakness with respect to our measures is the low Cronbach's alpha of the knowing specific scale. We used a self-created scale as there were no scales available from other researchers. Originally, the scale consisted of six items for two sub-dimensions (i.e. (1) diversity concerning background, (2) diversity concerning interconnectedness). However, participants answered the two sub-dimensions completely differently. Hence, we dropped the second sub-dimension and only used the measure as three-item-scale, yet with a rather unsatisfying reliability.

Finally, we want to address that we did not manipulate people's knowledge. The experimental factors were only based on technical features of professional SNS. Thus, it is not possible to define causality for the relation between knowledge and networking behavior. On the other hand, in this controlled set-up with fake profiles it is simply not possible that participants experienced benefits out of their networking behavior and as a consequence scored higher in the subsequent knowing scales. So, we can at least assume causality. However, in future studies it would be interesting to manipulate people's knowledge to see how their behavior might change when they learn about the benefits during the study.

6. Conclusion

In conclusion, this is one of the first studies to combine cognitive, affective and technical influences of the website functionalities in a controlled experimental set-up to see how all those elements influence people's networking behavior on professional SNS. We propose four ways to improve current professional SNS to support users with their networking pursuits and as a consequence to help users with their personal work performance and career advancement by encouraging them to network more and more diverse.

ARTICLE III

Information Design of Contact Recommendations in Business Contexts: Towards a New Way of Recommending People

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Information Design of Contact Recommendations in Business Contexts: Towards a New Way of Recommending People

Abstract

Professional social networking sites (SNS) offer great opportunities when it comes to connecting with a diverse set of people that provides access to new perspectives and new information. Connecting with people with different expertise and knowledge can enhance personal work performance and career advancement, especially for knowledge workers. Yet, many people are online mainly connected with others they know from their direct work environment. So far, most research concerning the influences on (online) networking behavior looked at individual differences. There is almost no research investigating how the given information of the professional SNS can influence users networking behavior. We therefore examine how different types of explanations and different types of information within the presentation of contact recommendations can influence people's networking behavior online and encourage users to build more diverse business networks. Two experimental studies ($N_1 = 120$ and $N_2 = 320$) were conducted to draw implications on how to improve professional SNS. We find that overall similar profiles are chosen with a higher probability. However, an explanation why someone is recommended and thereby hinting at the benefits of diverse online networking reduces the influence of similarity. Moreover, presenting information about dissimilarities in contrast to information about similarities can reduce the influence of similarity as people rather heuristically look for large numbers. Finally, results are discussed and implications to improve professional SNS are drawn.

1. Introduction

When it comes to innovation and creativity, a diverse (business) network is key to success (Adler & Kwon, 2002; Baer, 2010; Burt, 2004; Kochan et al., 2003). Parise, Whelan, and Todd (2015) for example showed that people with a diverse Twitter network tend to generate better business ideas because "a diverse network provides exposure to people from different fields who behave and think differently. Good ideas emerge when the new information received is combined with what a person already knows" (Parise, Whelan & Todd, 2015, p. 21). Today, with professional social networking sites (SNS) such as LinkedIn or the German platform XING, networking opportunities potentially have no limits. It has become possible to connect with industry experts, influencers, and knowledgeable people from all sorts of fields and from all over the world who have the potential to provide access to new perspectives and new

information. Professional SNS even support online networking by recommending people to connect with. Building larger, more diverse business networks can become easier with professional SNS. Yet, many people are online mainly connected with others they know from the offline world such as colleagues and university friends with similar backgrounds, similar expertise, and many contacts in common failing the requirements of an eligible business network (Papacharissi, 2009; Utz & Muscanell, 2014). On one hand side, this is because of the homophily principle according to which people rather build relationships with similar than with dissimilar others (McPherson, Smith-Lovin & Cook, 2001, p. 416). Consequently, people's personal networks are rather characterized by uniformity than by diversity. On the other hand, professional SNS even support that behavior by recommending people based on similarities such as similar profile information, same company, or attendance of the same school. After the friend-of-a-friend approach, also the number of common contacts plays a role in recommending people (Agarwal & Bharadwaj, 2013; Chamoso, Rivas, Rodríguez, Bajo, 2018; Guy, Jacovi, Perer, Ronen & Uziel, 2010; Huang, Tunkelang, Karahalios, 2014; LinkedIn, 2020).

When we think about ways to encourage people to build more diverse business networks, we first have to investigate whether people would accept a more diverse set of recommendations. Recommendations which do not satisfy people's natural endeavor to connect with similar others. Baumann and Utz (2019) examined whether people would accept dissimilar contact recommendations and how people's knowledge about the benefits of (diverse) online networking is connected to it. These authors found that when people knew about the general benefits of networking, they did network more. Moreover, when people specifically knew about the benefits of diversity, they did network more diverse. Finally, when people were presented with mainly dissimilar contact recommendations, they did not network less but consequently ended up with a more diverse business network. A similar effect has been shown in the context of recommending information. When people were recommended with preference-inconsistent information next to preference-consistent information, confirmation bias was reduced as participants tended to follow the recommendation and to engage with the alternative perspective (Schwind & Buder, 2012; Schwind, Buder, Cress & Hesse, 2012). Based on these results, we wanted to see how the information design of contact recommendations can influence people's networking behavior. Thus, we conducted two experimental studies to see how different types of explanations hinting at dissimilar others and referring to the benefits of diverse networking as well as different types of information about the recommended business contacts will influence people's networking behavior in the very moment of online networking.

2. Theoretical Background and Hypotheses

2.1 Explanations in Recommender Systems

The use of explanations in (product) recommender systems has a long research tradition in the field of human-computer-interaction (HCI). Starting in the early 2000, there was a shift in how algorithms of a recommender systems were evaluated. Previously, recommender systems have only been evaluated by accuracy metrics but then programmers started to recognize that user satisfaction was equally or even more important as users "don't care about using an algorithm that scored better on a metric, they want a meaningful recommendation" (McNee, Riedl & Konstan, 2006, p. 1100; Tintarev & Mastoff, 2007). Here, explanations can make an important contribution. An explanation is any additional information accompanying a recommender system's output offering the opportunity to fulfill several functions. Explanations can make the system more transparent; they can increase users' trust in the system, help users make better decisions (i.e. increase effectiveness), and help users make decisions faster (i.e. increase efficiency). Moreover, they can invite users to try new things (i.e. increase persuasiveness), and finally increase the ease of use, enjoyment, and satisfaction (Tintarev & Masthof, 2011).

Besides their formal functions, there are two approaches that explanations can be based on content-wise. One approach are so-called *social explanations* making people aware of who else likes the item that is recommended for example by presenting product ratings or by presenting other items following the premise of "customers who looked at this item also looked at the following ones." Social explanations can also be based on social network information. Facebook and Twitter for example recommend pages of musicians, movies, and other things with information on how many friends like the page (Sharma & Cosley, 2013; Wang, Ester, Bu & Cai, 2014). The second approach are *fact-based explanations* presenting additional argumentative information (Muhammad, Lawlor & Smyth, 2016; Naveed, Donkers & Ziegler, 2018; Symeonidis, Nanopoulos & Manolopoulos, 2009; Zanker & Ninaus, 2010; Zanker & Schoberegger, 2014). Fact-based explanations can either be based on information about the user (We recommend the item because it fits your need of XY") or about the item ("… because it has the feature of XY"), as well as in contrast to alternatives (" … because it has a better XY than alternatives") (Friedrich & Zanker, 2001).

The shift in the evaluation of recommender system towards a user-centered approach has led to the fact that today most systems are evaluated with user tests that ask for satisfaction, perceived usefulness, perceived trust, willingness to return, or intention to buy (e.g. Karacapilidis,

Malefaki & Charissiadis, 2017; Kouki, Schaffer, Pujara, O'Donovan & Getoor, 2017; Muhammad, Lawlor, Smyth, 2016; Naveed, Donkers, Ziegler, 2018; Symeonidis, Nanopoulos, Manolopoulos, 2009). This type of evaluation, however, has the downside that all criteria are with respect to users' subjective experience and what they think is good. The question remains whether explanations can also influence people's behavior in a way that is different to how they normally behave meaning that explanations are so convincing that people get involved with the system and act accordingly even if it is against their natural intention. Only a few studies look at how recommender systems influence people's behavior (Gkika & Lekakos, 2014; Guy, Ronen & Wilcox, 2009; Sharma & Cosley, 2013). Overall, most HCI research focusses on user satisfaction with the recommendations but not whether the design and the use of explanations indeed influences user behavior towards an expected outcome. In our case, whether explanations for contact recommendations on public professional SNS can encourage people to choose dissimilar business contacts over similar ones making their assembled business networks more diverse.

We would like to use fact-based explanation to give people a reason to connect with dissimilar others. We assume that the more elaborated the explanations are, the more convincing they will be. We therefore want to compare a no explanation condition as a baseline with a simple explanation condition making users aware of dissimilar others, and a detailed explanation condition additionally making users aware of the benefits of diversity. Hence, hypotheses one and two are the following: H1: The amount of networking will be highest in the detailed explanation condition followed by the simple explanation condition and finally lowest in the no explanation condition. H2: Diversity concerning expertise and occupation of the assembled networks will be highest in the detailed explanation condition followed by the simple explanation condition and finally lowest in the no explanation condition. However, we do not think that explanations can overrule all basic principles (e.g. the homophily principle) with whom we build relationships with (McPherson, Smith-Lovin & Cook, 2001). Yet, they might influence those basic principles in the way that they will weaken the relation between similarity and users' urge to connect. Therefore, we assume the following: H3: Similarity of the profile to the participant will influence the probability of the profile to be chosen. Profiles with higher similarity will be chosen with higher probability. H4: The explanations will have a weakening moderation effect. The more detailed the explanations are, the weaker the effect of similarity on the probability of the profile to be chosen.

2.2 Information in Recommender Systems

Besides fact-based, argumentative explanations that try to convince people to connect with dissimilar others, we wanted to look at how the presentation of the recommended business contact itself can be changed to encourage people to build more diverse business networks. So far, contact recommender systems emphasize similarities such as for example working for the same company, attendance of the same school, or the number of common contacts as a reason to connect (Chamoso et al., 2018; Huang, Tunkelang, Karahalios, 2014; LinkedIn, 2020). A different approach would be to provide and emphasize information about dissimilarities as basis of recommendation and as reason to connect. When looking for studies modifying the type of information shown, we only found literature in the field of organizational research concerning the topic of team formation. In 2019, Gómez-Zará et al. investigated how students assemble project teams using the online platform *My Dream Team* (Contractor, DeChurch, Anup & Li, 2013). In a first study, Gómez-Zará et al. (2019) found that students mostly invited those people into their team who they already knew, had previously worked with, or were friends with. The authors concluded that to increase the likelihood of more diverse teams, the system should offer additional information about "potential teammates' diversity metrics" (Gómez-Zará et al., 2019, p. 11).

In a follow-up experiment, Gómez-Zará, Guo, DeChurch, and Contractor (2020) looked at how displaying information on how much the potential teammate would diversify the team will impact the team formation process. They found that when diversity information was shown, potential teammates who would increase team diversity were between 42 and 49 percent less likely to be invited. When diversity information was not shown, potential teammates who would increase team diversity had the same chance to be invited as those who would not increase team diversity since participants simply did not know about their effect on team diversity. Hence, highlighting differences without any context primarily had a negative effect on team diversity. The authors concluded that priming people about the benefits of diversity or framing diversity as strengths and complements might help to reverse the effect (Gómez-Zará et al., 2020).

In summary, features of the system as well as interface designs can influence people's behavior. They can either promote or mitigate decisions, interactions, or behaviors. However, as shown in Gómez-Zará et al., (2020) possibly in the opposite direction as intended. We therefore want to see how different types of explanations providing context and priming people about the benefits of diversity do interact with different types of information emphasizing dissimilarities

as a reason to connect. We propose the following additional hypotheses: H5: Similarity information will positively influence the probability of the profile to be chosen i.e. profiles with higher similarity will be chosen with higher probability. In reverse, dissimilarity information will negatively influence the probability of the profile to be chosen, i.e. dissimilar profiles will be chosen with a lower probability. As before, we do assume that an explanation can weaken the effect of similarity and dissimilarity information as in H6: The type of explanation will show an interaction effect with the similarity/dissimilarity information. A simple explanation will slightly weaken the positive effect of similarity and the negative effect of dissimilarity and a detailed explanation will strongly weaken the positive effect of similarity and the negative effect of dissimilarity.

In two experiments we want to investigate how different types of explanations (experiment one and experiment two) and different types of information (experiment two) will influence people's behavior concerning the building of diverse business networks. We started with experiment one and planned the second experiment as a follow-up study. Hence, hypotheses have been pre-registered[3] for two individual studies: experiment one with hypotheses one, two, three, and four; experiment two with hypotheses one, two, five, and six.

3. Experiment One

3.1 Methodology Experiment One

3.1.1 Design and Sample

Experiment one had a 2x3 design. The first experimental factor was a within-subject-factor that referred to the fake people (in the following called *profiles*) that were presented as contact recommendations (similar vs. dissimilar to the participant). The second experimental factor was a between-subject-factor defining the type of explanation (none vs. simple vs. detailed) that was presented in addition to the contact recommendations. Participants were randomly assigned to one of the three between-subject experimental conditions.

The sample was recruited via Prolific. We invited English-speaking people who were at least 21 years old. As a result, the sample consisted of 120 working people with the majority coming from the UK (84 percent), followed by the US (13 percent), and other countries (3 percent). Mean age was 36 years (ranging from 21 to 63; *median* = 33.5, *SD* = 11). Moreover, to participate they needed to have an account on a business networking site such as for example

[3] Experiment one: http://aspredicted.org/blind.php?x=wr22xk and experiment two: http://aspredicted.org/blind.php?x=xr58j7

LinkedIn to be familiar with the receiving of contact recommendations and the sending of contact requests. Nearly two third of the sample were female (65 percent), 79 percent of the sample were employed within an organization, 11 percent were self-employed, and 10 percent were currently job-seeking.

3.1.2 Procedure

The online experiment was created as an HTML-file to be able to implement a mock-up business networking site into the questionnaire. The study contained many filler tasks to distract participants from the research goal. As cover story participants were told that the study investigated modern working life with its different aspects. Hence, participants worked on several tasks such as extracting information from a diagram for a board meeting or answering questions concerning their soft skills and work values. After the distractions, the networking part was introduced with a neutral statement expressing that in their free time, they wanted to check on their account to see who was getting recommended as a business contact. On the following mock-up business network site participants were presented with 24 profiles as contact recommendations. Participants did not need to network and there was no minimum time they had to wait to be able to continue to the next page. When participants clicked on a connect button, feedback was shown that a contact request was sent to the other person. A screenshot of the mock-up business networking site can be seen in Figure 1.

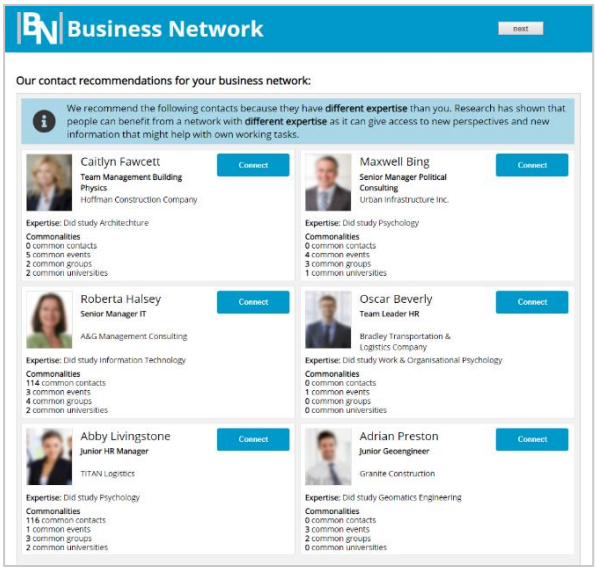

Figure 1: Screenshot of the mock-up business networking site showing the first six contact recommendations in the detailed explanation condition. Scrolling down would present 18 further recommendations as in total 24 recommendations were presented.

3.1.3 Materials

For the contact recommendations we created 164 profiles by automatically mixing different names, study courses, jobs, and companies from a database combined with randomly attributed numbers of fake commonalities such as common contacts, common events, common groups, and common universities. The profiles were assembled in six different sets of 24 to rotate profiles, profile combinations, and profile positions between participants, as every participant

was randomly assigned to one of the six sets. Moreover, profile photos were randomly allocated in each set and additionally blurred to rule out any influence. Gender and hierarchy level (junior, intermediate, or senior level) of the profiles were balanced within the sets. The profiles differed in their expertise (i.e. study course), their occupation (combination of job and company), and their fake commonalities (numbers of common contacts, common events, common groups, and common universities) with the participant.

Basic similarity was defined with respect to a scenario that participants held a business degree and were working in logistics. For a basic similarity score, we calculated +1 for each match with the profile leading to a score with values ranging from zero (no match) to one (one match: either business degree or occupation in logistics) to two (two matches: both business degree and occupation in logistics). Divided by the maximum of two, values of the final score ranged from zero to one. The numbers of the four similarity metrics (numbers of common contacts, common events, common groups, and common universities) were also divided by the respective maximum, so values likewise ranged from zero to one. As a result, some profiles were more, and others were less similar to the participant with respect to the scenario and with respect to the randomly assigned numbers of commonalities.

As already mentioned, each participant was presented with 24 profiles as contact recommendations. In the no explanation condition, all profiles were just presented on one page to scroll through. In the simple and detailed explanation condition, however, there were information boxes in front of each six profiles. These information boxes contained explanations why the following profiles were recommended, and the subsequent profiles fit the content of the explanation. In the simple explanation condition, the first six profiles were introduced with: “We recommend the following contacts because they have different *expertise* than you.” In the detailed explanation condition this one sentence was extended by a second one referencing the benefits of diversity with: “Research has shown that people can benefit from a network with different *expertise* as it can give access to new perspectives and new information that might help with own working tasks.” The first explanation referred to the profiles’ expertise, the second explanation to present profiles number seven to twelve, referred to profiles’ occupations, the third referred to a low interconnectedness, and the fourth one was rather generally hinting at the benefits of professional networking.

3.1.4 Dependent Variables

At the assembled network level, the first dependent variable was how many profiles were chosen by the participant with values ranging from zero to 24. Also, we calculated the diversity of the newly built network every participant assembled with Blau's index (1977) of heterogeneity for categorial attributes (for an overview on diversity measures see Harrison & Klein, 2007). Blau's index was calculated for network diversity concerning expertise and concerning occupation both times in the standardized form, divided by the maximum that would have been possible. Hence, values ranged from zero to one, with low values meaning that profiles' expertise/occupation fell into the same category, high values meaning that profiles' expertise/occupation did fall into different categories. We did not combine the two values into one diversity score as diversity is attribute specific. A group (i.e. assembled business network) can be diverse concerning one attribute and at the same time not be diverse concerning another attribute (Harrison & Klein, 2007). The last dependent variable at the individual profile level was whether a profile was chosen by the participant or not (0 = not selected vs. 1 = selected) to see how different features of the profiles influence the probability of the profile to be chosen.

3.1.5 Attention and Manipulation Check

We included an attention check item as well as four manipulation check items asking how much participants empathized with the scenario while networking. Participants who failed the attention check (n = 2) or could not identify with the scenario (n = 22), with an overlap between the two were excluded from data analysis. The final sample consisted of 97 participants.

3.2 Results Experiment One

3.2.1 Descriptive Statistics

Descriptive statistics of experiment one are reported in Table 1.

dependent variables (assembled network level)	*M* (*SD*)
number added profiles (0-24)	6.73 (4.72)
diversity index (Blau's index) expertise (0-1)	0.64 (0.26)
diversity index (Blau's index) occupation (0-1)	0.65 (0.26)

Table 1: Descriptive statistics of the dependent variables at the assembled network level.

3.2.2 Hypotheses Testing

To test hypothesis one (the amount of networking will be highest in the detailed explanation condition followed by the simple explanation condition and finally lowest in the no explanation

condition) at the assembled network level, we conducted an analysis of variance (ANOVA) with the type of explanation as independent variable and the number of added profiles as dependent variable. We found that the mean values did not significantly differ from each another with $F(2,94) = 2.88$, *n.s.*. Descriptively, more people were added in the detailed explanation condition ($M = 8.30$, $SD = 4.97$), than in the no explanation condition ($M = 6.00$, $SD = 3.86$), and the simple explanation condition ($M = 5.80$, $SD = 4.78$). However, hypothesis one needs to be rejected. The same pattern was found for hypothesis two (diversity concerning expertise and occupation will be highest in the detailed explanation condition followed by the simple explanation condition and finally lowest in the no explanation condition). We conducted two ANOVAs one time with the diversity index concerning expertise and a second time with the diversity index concerning occupation as dependent variables and the type of explanation as independent variable. Diversity did not significantly but only descriptively differ between the three experimental conditions both for expertise $F(2,85) = 0.97$, *n.s.* and for occupation $F(2,85) = 2.41$, *n.s.*. Concerning expertise, the values of the no explanation condition ($M = 0.61$, $SD = 0.27$) and the simple explanation condition ($M = 0.61$, $SD = 0.27$) were the same. Only in the detailed explanation condition the assembled network was slightly more diverse ($M = 0.69$, $SD = 0.25$). Concerning occupation, the values of the no explanation condition ($M = 0.62$, $SD = 0.26$) and the simple explanation condition ($M = 0.60$, $SD = 0.29$) were almost the same. Only in the detailed explanation condition the diversity concerning occupation was descriptively higher ($M = 0.73$, $SD = 0.22$).

To test hypotheses three and four, the data set was organized in long format. Hence, the data set was organized as if the 24 different contact recommendations each participant could choose from were 24 different time points in a repeated measurements design. Since each row represented one of the 24 contact recommendations, 24 rows belonged to one participant. As profile selections were nested within participants, to test hypotheses three (similarity of the profile to the participant will influence the probability of the profile to be chosen) and four (explanations will have a weakening moderation effect on the positive effect of similarity on probability) we calculated mixed model logistic regression analyses (Agresti & Kateri, 2011). As dependent variable we used the variable *profile chosen by participant (0/1)* to see how different features of the profile influenced the probability of the profile to be chosen at the individual profile level. As fixed effect predictors we used the experimental conditions, the basic similarity score, and the four similarity metrics (numbers of common contacts, common

events, common groups, and common universities). Participants were modeled as random effect predictor as profile selection was nested within participants.

Model 1 in Table 2 shows the results of the first analysis, modelling the probability of the profile to be chosen with respect to its features. In line with hypothesis three, an increase in basic similarity (i.e. expertise and occupation) with the participant increased the probability of the profile to be chosen as well as increases in the numbers of common contacts, common events, and common groups did. Hence, hypothesis three is supported. Only the similarity metric of number of common universities did not have a significant effect. The type of explanation did not have an influence on the probability of the profile to be chosen which was already apparent when comparing the three experimental conditions concerning the number of added profiles. In the second model we included interaction terms between the explanations, the basic similarity score, and the four similarity metrics. The results show that there was only an interaction effect of the explanation conditions with the number of common contacts (see Figure 2) but not with the basic similarity score or with any other similarity metric. Hypothesis four is therefore only partially supported as the type of explanation weakens the effect of the number of common contacts on probability but it does not weaken the effect of basic similarity or the numbers of common events or common groups on the probability of the profile to be chosen.

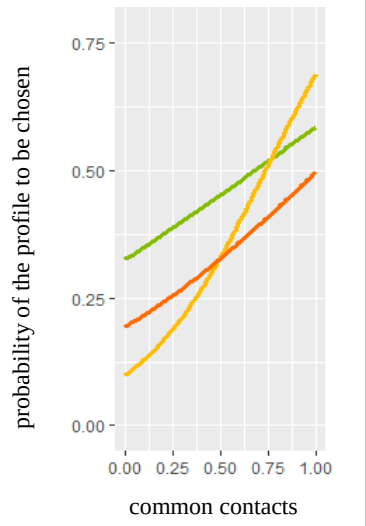

Figure 2: Logistic regression graph with slopes for the three experimental conditions (yellow: no explanation; orange: simple explanation; green: detailed explanation).

3.3 Discussion Experiment One

Experiment one shows that when people are presented with contact recommendations, they choose the ones that are similar to them with respect to basic similarity (i.e. expertise and occupation). Moreover, the numbers of common contacts, common events, and common groups influence people in their decision to send a contact request, with the number of common contacts having the greatest influence of all. We assume the number of common contacts has the greatest impact as current contact recommender system intensively use this information as basis of recommendations and as a reason to connect (LinkedIn, 2020).

	model 1				model 2			
predictor	**B**	**SE B**	**e^B**	**prob**	**B**	**SE B**	**e^B**	**prob**
intercept (no explanation)	-3.07 ***	0.35	0.05	0.04	-3.63 ***	0.52	0.03	0.03
basic similarity score	0.81 ***	0.15	2.25	0.69	0.76 *	0.34	2.14	0.68
simple explanation	-0.18	0.38	0.84	0.46	0.49	0.64	1.62	0.62
detailed explanation	0.63	0.39	1.87	0.65	1.29 *	0.63	3.64	0.78
number common contacts	2.07 ***	0.16	7.89	0.89	3.92 ***	0.38	50.57	0.98
number common events	0.93 ***	0.20	2.54	0.72	0.97 *	0.46	2.64	0.72
number common groups	0.37 *	0.17	1.44	0.59	-0.14	0.40	0.87	0.46
number common universities	0.14	0.15	1.15	0.53	0.14	0.34	1.16	0.54
interaction terms								
simple explanation X basic similarity score					0.22	0.44	1.24	0.55
detailed explanation X basic similarity score					-0.03	0.43	0.97	0.49
simple explanation X no. common contacts					-2.06 ***	0.46	0.13	0.11
detailed explanation X no. common contacts					-2.65 ***	0.46	0.07	0.07
simple explanation X no. common events					-0.16	0.58	0.85	0.46
detailed explanation X no. common events					0.11	0.57	1.12	0.53
simple explanation X no. common groups					0.56	0.51	1.75	0.63
detailed explanation X no. common groups					0.71	0.49	2.03	0.67
simple explanation X no. common universities					-0.12	0.43	0.87	0.47
detailed explanation X no. common universities					-0.02	0.41	0.98	0.50
marginal R^2 / conditional R^2	0.20 / 0.49				0.23 / 0.52			

Table 2: Mixed model logistic regression analyses: Dependent variable: profile chosen by participant (0/1). Independent variable: basic similarity score, type of explanation (none vs. simple vs. detailed), similarity metrics (number common contacts, events, groups, and universities). e^B = exponentiated B (odds ratio), prob = probability. Random effects omitted from table.
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Moreover, in a pretest of the research environment we asked participants to briefly state why exactly they decided for the people they did. Here, many participants told us that they looked for common contacts with the other person because many common contacts mean “that you are already part of the same network only this very link between you and the other person is missing”. According to this, the large impact of the number of common contacts in our study is completely understandable.

More important however, experiment one shows that the strong influence of the number of common contacts can be weakened by an explanation that makes people aware of dissimilar others and an explanation that additionally makes people aware of the benefits of diversity. The explanations that introduced the contact recommendations each referred to a different type of dissimilarity. The first explanation referred to different expertise, the second one referred to different occupation, and the third explanation referred to a low number of common contacts. In the case of the number of common contacts, the presentation of an explanation reduces the impact of similarity on the probability of the profile to be chosen. However, the presentation of an explanation does not reduce the influence of basic similarity concerning expertise and occupation, although two explanations specifically referred to those types of differences. We assumed that at least in the detailed explanation condition participants would have also added some profiles with different expertise and different occupations. Unfortunately, our expectations have not been confirmed. We think this is because people do not fully understand the benefits of diversity concerning expertise and occupation, but they do understand the benefits of diversity concerning low interconnectedness. Connecting with someone from the same business field but with whom no one else in my network is connected, can give access to information no one else in my network has access to. Hence, the benefits are unmistakable. Benefits coming from connecting with people with different expertise and different occupation might not be that obvious. Here, people might assume that the information, they will receive from these business contacts will have no value for their own work. As a result, we believe that participants were not motivated to accept the explanation and act accordingly because of a lack of understanding of the value of diversity concerning expertise and occupation.

Nevertheless, in this experiment we did only offer information about similarities (e.g. numbers of common contacts, common events, common groups, and common universities) to help participants decide who to choose. Despite the explanations hinting at dissimilar others and hinting at the benefits of diversity the information of the contact recommendation itself was

again emphasizing similarities as basis of recommendation and as a reason to connect. In experiment two, we therefore wanted to go one step further by examining how emphasizing information about dissimilarities as basis of recommendation will influence people's decision with whom to connect. We wanted to see how different types of explanations will interact with different types of information and influence people's decision when networking online.

4. Experiment Two

4.1 Methodology Experiment Two

4.1.1 Design and Sample

Experiment two had a 2 (similarity: similar vs. dissimilar to the participant) x 3 (explanation: none vs. simple vs. detailed) x 2 design. The third experimental factor was another between-subjects-factor that defined the type of information that was presented. So far, the profiles were presented with information about commonalities such as common contacts, common events, common groups, and common universities. In experiment two we added a condition in which the profiles were presented with information about dissimilarities. To keep both conditions comparable we used the following wordings: "common contacts" in the similarity information condition vs. "contacts in other business sectors" in the dissimilarity information condition as well as "common skills" vs. "complementary skills", "percent increase in uniformity within your network concerning expertise" vs. "percent increase in diversity within your network concerning expertise", and finally "percent increase in uniformity within your network concerning profession" vs. "percent increase in diversity within your network concerning profession", the last two referring to the wording by Gómez-Zará et al. (2020). Participants were randomly assigned to one of the six between-subject experimental conditions.

The sample was again recruited via Prolific. We invited English-speaking people who were at least 21 years old and did not participant in experiment one. As a result, the sample consisted of 320 working people with the majority living in the UK (58 percent), followed by the US (38 percent), and other countries (4 percent). The mean age was 36 years (ranging from 22 to 69; *median* = 32, *SD* = 10.80). Gender was nearly balanced with 53 percent women and 47 percent men. Again, to participate they needed to have an account on a business networking site such as for example LinkedIn to be familiar with how those sites work. 78 percent of participants were employed within an organization, 16 percent were self-employed, and 6 percent were currently job-seeking.

4.1.2 Procedure and Materials

The procedure of experiment two was the same as in experiment one. The materials of experiment two were the same as in experiment one. The randomly assigned numbers of previously common contacts, common event, common groups, and common universities stayed the same but were now presented with the modified wording according to the experimental condition.

4.1.3 Dependent Variables

The dependent variables of experiment two were the same as in experiment one.

4.1.4 Attention and Manipulation Check

Attention and manipulation check of experiment two were the same as in experiment one. Participants who failed the attention check (n = 39) or could not identify with the scenario (n = 46), with an overlap between the two were excluded from data analysis. The final sample consisted of 243 participants.

4.2 Results Experiment Two

4.2.1 Descriptive Statistics

Descriptive statistics of experiment two are reported in Table 3.

dependent variables (assembled network level)	*M (SD)*
number added profiles (0-24)	6.00 (4.95)
diversity index (Blau's index) expertise (0-1)	0.65 (0.28)
diversity index (Blau's index) occupation (0-1)	0.63 (0.32)

Table 3: Descriptive statistics of the dependent variables at the assembled network level.

4.2.2 Hypotheses Testing

To test hypothesis one (the amount of networking will be highest in the detailed explanation condition followed by the simple explanation condition and finally lowest in the no explanation condition) at the assembled network level, we conducted an analysis of variance (ANOVA) with the type of explanation as independent variable and the number of added profiles as dependent variable. As in experiment one, we found that the mean values did not significantly but only descriptively differ from one another (F(2,240) = 0.82, *n.s.*). Descriptively, more people were added in the detailed explanation condition (M = 6.54, SD = 4.79), than in the simple explanation condition (M = 5.91, SD = 5.03), and in the no explanation condition

(*M* = 5.60, *SD* = 5.04). Hypothesis one therefore needs to be rejected. The same pattern was true for hypothesis two (diversity concerning expertise and occupation will be highest in the detailed explanation condition followed by the simple explanation condition and finally lowest in the no explanation condition) which had to be rejected as well. The diversity indices concerning expertise and occupation did not significantly but only descriptively differ between the three experimental conditions for expertise $F(2,215) = 0.96$, *n.s.* and for occupation $F(2,215) = 0.90$, *n.s.*. Concerning expertise, the values slightly increased from the no explanation condition (*M* = 0.61, *SD* = 0.29), to the simple explanation condition (*M* = 0.65, *SD* = 0.29), to the detailed explanation condition (*M* = 0.67, *SD* = 0.27). Regarding diversity concerning occupation, the value of the no explanation condition (*M* = 0.59, *SD* = 0.31) was lower than the values of the simple explanation condition (*M* = 0.65, *SD* = 0.32), and the detailed explanation condition (*M* = 0.65, *SD* = 0.33), which were the same.

We then calculated mixed model logistic regression analyses with *profile chosen by participant (0/1)* as dependent variable to test hypotheses five (similarity of the profile will positively influence the probability of the profile to be chosen; dissimilarity of the profile will negatively influence the probability of the profile to be chosen) and six (explanations will weaken the positive effect of similarity and the negative effect of dissimilarity on probability). We divided the data set into two subsets (similarity information condition, *n* = 116 vs. dissimilarity information condition, *n* = 127) and calculated the mixed model logistic regression analyses with each subset individually. We first thought about calculating models with the whole data set. However, as the meaning of the numbers of the similarity/dissimilarity metrics (e.g. number of common vs. other contacts, number of common vs. complementary skills) differed with respect to the experimental conditions (i.e. in the similarity information condition large numbers meant higher similarity vs. in the dissimilarity information condition large numbers meant higher dissimilarity) we would have had to reverse code the numbers of the dissimilarity information condition. Thereby, large numbers of the dissimilarity information condition would have become small numbers of similarity. Yet, as we saw in experiment one, participants looked for large numbers especially for large numbers of common contacts. We decided not to treat large numbers of the dissimilarity information condition as small numbers of similarity as participants were presented with the exact same numbers only with a different wording. Also, models with the whole data set, would have included numerous (i.e. 27) interaction terms, including three way interactions between the experimental conditions of explanation, the experimental conditions of information, the similarity score, and all four similarity/dissimilarity

metrics. This would have made it very hard to interpret the individual estimates. Hence, we opted for calculating the models for the two subsets separately. As predictors we used the experimental conditions concerning the type of explanation, the basic similarity score, and the four similarity/dissimilarity metrics. Again, all numbers were divided by the maximum, so values ranged from zero to one. Again, participants were modeled as random effect predictor as profile selection was nested within participants.

Table 4 shows the results for both the similarity and the dissimilarity information conditions. Models sim.1 and dis.1 show that an increase in basic similarity increased the probability of the profile to be chosen. Basic similarity (i.e. expertise and occupation) did not differ between the two conditions, so no difference was expected. The same effect was true, however, for the number of "common contacts" in the similarity information condition and for the number of "contacts in other business sectors" in the dissimilarity information condition. In both cases larger numbers of contacts increased the probability of the profile to be chosen. The same applied for the uniformity/diversity metric concerning occupation. Profiles with both larger percentage points of increase in "uniformity" and "diversity" concerning occupation were chosen with a higher probability. In the similarity information condition also the number of "common skills" and the metric of "increase in uniformity concerning expertise" had a positive effect which was not existent in the dissimilarity information condition. Hence, hypothesis five was only supported with respect to the similarity information condition but not with respect to the dissimilarity information condition, where a decrease in probability was expected.

When we look at models sim.2 and dis.2 for interaction effects with the explanations, we again found a weakening interaction effect between the number of common contacts and the explanations on the probability of a profile to be chosen for the similarity information condition as in experiment one and as predicted. However, this time only for the detailed explanation but not for the simple explanation (see Figure 3). This weakening moderation effect was not true for the dissimilarity information condition as also expected in hypothesis six. However, as the influence in the dissimilarity information condition was not negative but positive right from the start theoretically there should have been a strengthening moderation effect which was also not the case. Moreover, model sim.2 showed an interaction effect for the metric of "increase in uniformity concerning occupation" (similarity information condition) with the detailed explanation (see Figure 4). In the detailed explanation condition profiles with large numbers of "percent increase in uniformity within the network concerning profession" were selected with

	similarity information condition								dissimilarity information condition							
	model sim.1				model sim.2				model dis.1				model dis.2			
predictor	**B**	**SE B**	**e^B**	**prob**	**B**	**SE B**	**e^B**	**prob**	**B**	**SE B**	**e^B**	**prob**	**B**	**SE B**	**e^B**	**prob**
intercept (no explanation)	-3.06 ***	0.31	0.05	0.04	-3.97 ***	0.48	0.02	0.02	-2.77 ***	0.28	0.06	0.06	-3.14 ***	0.39	0.04	0.04
basic similarity score	0.84 ***	0.14	2.32	0.70	1.07 ***	0.24	2.92	0.74	0.47 ***	0.13	1.59	0.61	0.84 ***	0.23	2.33	0.70
simple explanation	0.12	0.32	1.13	0.53	1.21 *	0.61	3.35	0.77	0.13	0.32	1.14	0.53	0.54	0.56	1.72	0.63
detailed explanation	-0.01	0.33	0.99	0.50	1.35 *	0.63	3.85	0.79	0.57	0.30	1.77	0.64	1.14 *	0.52	3.13	0.76
number common/other contacts	1.10 ***	0.19	3.01	0.75	1.51 ***	0.35	4.52	0.82	1.18 ***	0.18	3.25	0.76	1.26 ***	0.33	3.51	0.78
number common/compl. skills	0.45 *	0.18	1.57	0.61	0.89 **	0.34	2.43	0.71	0.13	0.17	1.14	0.53	0.35	0.30	1.42	0.59
increase uniformity/diversity exp.	0.85 ***	0.18	2.34	0.70	1.01 **	0.35	2.74	0.73	0.28	0.17	1.33	0.57	0.43	0.30	1.54	0.61
increase uniformity/diversity occ.	0.41 *	0.18	1.50	0.60	1.02 **	0.33	2.78	0.74	0.62 ***	0.17	1.86	0.65	0.60	0.31	1.82	0.65
interaction terms																
sim. expl. X basic similarity score					-0.50	0.33	0.60	0.38					-0.90 **	0.34	0.41	0.65
det. expl. X basic similarity score					-0.11	0.34	0.90	0.47					-0.31	0.31	0.73	0.42
sim. expl. X no. com./other cont.					-0.12	0.47	0.89	0.47					0.24	0.47	1.28	0.56
det. expl. X no. com./other cont.					-1.02 *	0.48	0.36	0.27					-0.38	0.43	0.68	0.41
sim. expl. X no. com./compl. skills					-0.66	0.46	0.52	0.34					-0.32	0.44	0.73	0.42
det. expl. X no. com./compl. skills					-0.57	0.46	0.57	0.36					-0.30	0.40	0.74	0.42
sim. expl. X increase uni/div exp.					-0.35	0.46	0.71	0.41					-0.61	0.44	0.54	0.35
det. expl. X increase uni/div exp.					-0.01	0.47	0.99	0.50					0.04	0.41	1.04	0.51
sim. expl. X increase uni/div occ.					-0.56	0.45	0.57	0.36					0.55	0.45	1.73	0.63
det. expl. X increase uni/div occ.					-1.11 *	0.46	0.33	0.25					-0.30	0.40	0.74	0.42
marginal R^2 / conditional R^2	0.07 / 0.39				0.08 / 0.40				0.05 / 0.38				0.07 / 0.39			

Table 4: Mixed model logistic regression analyses: Dependent variable: profile chosen by participant (0/1). Independent variable: basic similarity score, type of explanation, similarity metrics. e^B = exponentiated B (odds ratio), prob = probability. Random effects omitted from table. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

a lower probability than in the other two experimental conditions with a simple or no explanation. Again, the weakening moderation effect was not existent in the dissimilarity information condition as it was expected.

Concerning the dissimilarity information condition there was only one moderation effect. There was a weakening moderation effect between the simple explanation and the basic similarity score on the probability of the profile to be chosen. When participants were presented with information empathizing dissimilarity with the contact recommendation in combination with a simple explanation hinting at dissimilar others, participants chose profiles that were similar to them with respect to expertise and occupation with a lower probability (see Figure 5). This weakening moderation effect was not present in the similarity information condition. As the basic similarity score did not differ between the similarity information condition and the dissimilarity information condition, we did not assume a difference between the two conditions. In summary, hypothesis six can only be partially supported. There was evidence for a weakening moderation effect in the similarity information condition, however there were no weakening moderation effects in the dissimilarity information condition as expected but only an effect that was not expected.

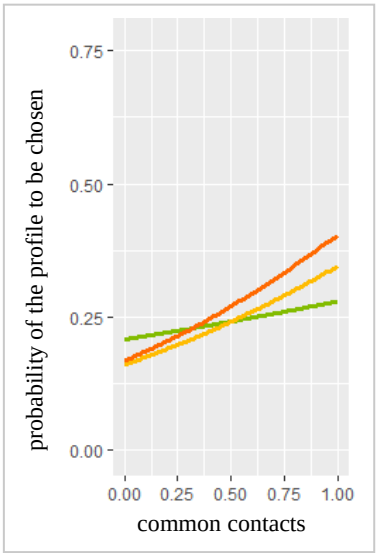

Figure 3: Logistic regression graph with slopes for the three experimental conditions (yellow: no explanation; orange: simple explanation; green: detailed explanation) for the similarity information condition.

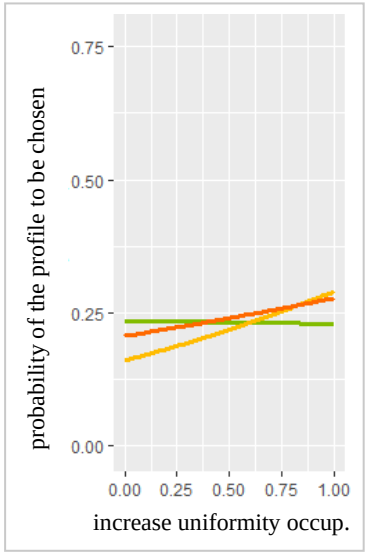

Figure 4: Logistic regression graph with slopes for the three experimental conditions (yellow: no explanation; orange: simple explanation; green: detailed explanation) for the similarity information condition.

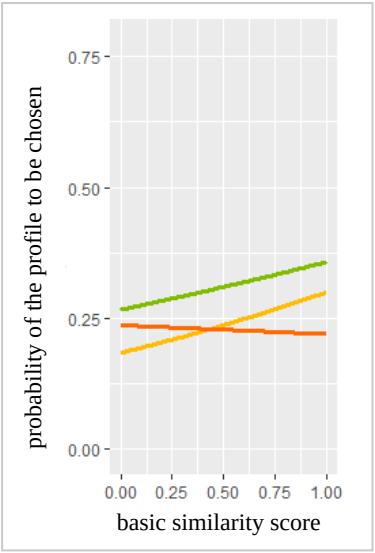

Figure 5: Logistic regression graph with slopes for the three experimental conditions (yellow: no explanation; orange: simple explanation; green: detailed explanation) for the dissimilarity information condition.

4.3 Discussion Experiment Two

First, experiment two did replicate the findings of experiment one. Again, there was no significant but only descriptive difference between the three experimental conditions concerning the type of explanation (none vs. simple vs. detailed) with respect to the number of added profiles and the diversity concerning expertise and occupation of the resulting network. Again, the basic similarity of the profile to the participant influenced the probability of the profile to be chosen as well as the number of common contacts (in the similarity information condition) did. Finally, again the detailed explanation weakened the effect of the number of common contacts (in the similarity information condition) on the probability of the profile to be chosen. Second, interestingly in contrast to hypothesis five, we saw that in the dissimilarity information condition people did not avoid profiles with higher dissimilarity (i.e. large numbers of contacts in other business sectors) but chose these profiles with higher probability. We believe this reflects a rather heuristic behavior. Based on current contact recommender systems which mainly recommend business contacts based on similarities and based on the number of *common* contacts people are conditioned to look for large numbers. They presumably did not interpret that many contacts in *other business sectors* stood for a higher dissimilarity. Hence, in both information conditions, people looked for large numbers when it came to the number of contacts, independent of whether it represented the number of *common* contacts (meaning higher similarity) or the number of contacts in *other business sectors* (meaning higher dissimilarity).

Finally, we did find the same effect with the similarity/dissimilarity metric of *increase in uniformity/diversity concerning occupation*. The effect was smaller, however, again participants chose profiles with larger numbers over profiles with smaller numbers in both information conditions. Hence, in the similarity information condition participants chose the profiles that increased *uniformity* within their networks and in the dissimilarity information condition they chose the ones that increased *diversity* within their networks concerning occupation. This time, there should have been no misunderstanding concerning the meaning as the wording in the dissimilarity information condition was very clear stating: “percent increase in diversity within your network”. Hence, our experiment contrasts with Gómez-Zará et al. (2020) as this time diversity was at least in part accepted and used to select business contacts. Furthermore, again a detailed explanation did weaken the effect for this metric as it did for the number of common contacts. However, again only for the similarity information condition but not for the dissimilarity information condition.

5. General Discussion

The aim of this article was to conduct two experimental studies to investigate how different types of explanations (experiment one and experiment two) and different types of information (experiment two) will influence people's behavior concerning the building of diverse business networks online. In summary, we see that providing an explanation why someone is recommended does not directly influence the amount of networking or the diversity concerning expertise and occupation of the resulting network at the network level. However, we find that different types of explanations and different types of information can influence who people choose to connect with at an individual level. People in general choose to connect with business contacts who are similar to them concerning basic similarity (i.e. expertise and occupation) and concerning the number of common contacts when similarity information is emphasized. However, presenting an explanation hinting at dissimilar others and hinting at the benefits of diversity can weaken the strong impact of the number of common contacts on the probability of the profile to be chosen. Moreover, presenting information about dissimilarities as basis of recommendation and as a reason to connect does not simply make people avoid dissimilar others as participants chose profiles with many contacts in other business sectors and profiles which made their networks more diverse concerning occupation. Hence, the results seem to be more complex than we first assumed.

5.1 Theoretical Implications

Taken together, the two studies show that people follow the homophily principle (Ahuja, Soda & Zaheer, 2012; Ibarra, 1992; Ingram & Morris, 2007; McPherson, Smith-Lovin & Cook, 2001) and choose business contacts that are similar to them, concerning basic similarity (i.e. expertise and occupation) and in experiment one concerning the number of common contacts, common events, and common groups. This effect is also in line with the studies by Gómez-Zará et al. (2019) and Gómez-Zará et al. (2020). Even when people choose contacts for a virtual business network, with no future collaboration and no potential work conflict in sight; even when people simply connect to read interesting posts online; and even though professional SNS offer the opportunity to connect with a diverse set of people, with industry experts, influencers, and knowledgeable professionals from all sorts of fields and from all over the world who have the potential to provide access to new perspectives and new information, they choose the ones that are similar over the ones that are dissimilar. Thus, the homophily principle is a very strong determinant with whom we connect.

Nevertheless, both studies also show that the interface design of professional SNS can influence people's professional networking. At the assembled network level, we see that explanations only descriptively lead to an increase in the amount of networking and an increase in the diversity of the assembled network concerning expertise and occupation. However, at the individual profile level both studies show that explanations influence who people choose as business contacts, reducing for example the influence of the number of common contacts. Previous research has shown that explanations can enhance recommender systems by increasing users' trust in or users' overall satisfaction with the system (e.g. Kouki et al., 2017; Naveed, Donkers & Ziegler, 2018). However, while these studies looked at users' subjective experience, there is little research on whether explanations can influence user's behavior (Gkika & Lekakos, 2014; Sharma & Cosley, 2013). We were interested in whether different types of explanations would change people's networking behavior and encourage them to build more diverse business networks. Hence, our work contributes to research that evaluates recommender systems by analyzing objective behavioral data. Our results indicate that the benefits of explanations concerning people's subjective evaluation of the system do not necessarily transfer into preferred or desired behavior.

Regarding the type of information, we see that people rather look for large numbers than for the meaning of the numbers especially when it comes to the number of contacts. People choose business contacts with the largest numbers of both *common contacts* and *contacts in other business sectors*. As already mentioned, current business contact recommender systems on LinkedIn or the German platform XING usually recommend people based on the number of common contacts after the friend-of-a-friend approach (LinkedIn, 2020; Huang, Tunkelang, Karahalios, 2014). Thus, we assume that people are conditioned to look for large numbers when it comes to the number of contacts and rather heuristically choose the ones with the largest numbers without paying much attention to the wording. Besides, showing who else likes something is already considered an explanation namely a *social explanation* (Wang et al., 2014, p. 173; Sharma & Cosley, 2013). Facebook and Twitter for example recommend pages of musicians and movies with an explanation of how many friends like the page. Thus, the mentioning of common contacts can be interpreted as information on how many people of my business network know and maybe also trust the recommended person. Furthermore, the mentioning of common contacts or contacts in other business sectors can be interpreted as how popular a person is. Also, it can be interpreted with respect to the probability of acceptance of

the request. People with large networks might provide a higher probability to accept the contact request.

Finally, in our studies we used explanations that made people aware of the benefits of diversity and we used positive wordings such as “complementary skills” indicating the benefits of differences. This was also proposed by Gómez-Zará et al. (2020, p. 10) as an outlook for future studies. They suggested to prime people about the benefits of diversity and to use wordings that highlight the strengths of diversity as the term diversity itself might be interpreted as something negative. However, there was no effect of the complementary skills metric in the dissimilarity information condition despite the positive wording.

5.2 Practical Implications

Based on our results we propose the following ways to change the design of contact recommender systems on professional SNS: First, we propose to provide a detailed explanation why someone is recommended. Making people aware of dissimilar others seems to be not enough. Only an explanation that additionally makes people aware of the benefits of diversity can at least somehow influence people’s networking behavior, by making them network slightly more and slightly more diverse. Moreover, giving an explanation can reduce the impact of the number of common contacts on who will be chosen as a business contact. Second, we propose to use similarity and dissimilarity information in combination. We saw that people look for large numbers concerning common contacts and contacts in other business sectors. Combining the two types of information might provide a more comprehensive view about the potential business contact. Moreover, the same effect was true for the increase in uniformity/diversity concerning occupation metric. People used both metrics to send contact requests to people with larger numbers over smaller numbers. Hence, we think that providing people with information about similarities and dissimilarities will make decisions more elaborate as people can relate the two types of information to one another and get a better understanding on how the potential business contact will extend the network.

5.3 Strengths and Weaknesses

The strengths of the two studies are the following: First, the two samples consisted of working people both with a mean age of 36 years. All participants needed to have an account on a professional SNS to take part in the studies and therefore were familiar with how those sites work concerning the recommendation of business contacts and the sending of contact requests.

Hence, participants were members of the population we wanted to investigate. Second, the questionnaires contained many distracting filler tasks. For that reason, we believe that participants did not anticipate that the studies were only about the professional networking part. Third, as we recruited participants via Prolific, everyone filled in the questionnaire completely anonymously at home and most likely participants were already familiar with filling in questionnaires. Besides, the studies did not contain questions on sensitive or tabooed topics. As a result, we assume that the influence of social desirability is a minor problem.

Weaknesses, on the other hand, are the following: First, participants were certainly aware of the fact that the business networking site, the contact recommendations, and the sending of contacts requests were not real as there was no log-in necessary and they did not leave the questionnaire to go to another website. Moreover, participants did not need to formulate a contact request message as some professional SNS require. Therefore, there were no real ramifications to the professional networking. Second, participants had to empathize with a scenario of holding a business degree and working in logistics. This was necessary to define the similarity of the fake profiles. However, this was another element that brought people farther away from the feeling of real networking. Finally, we want to address that we did not program a recommender system for business contacts. We only looked at how potential interface designs influence user behavior to draw implications on how to improve professional SNS before investing time and resources into programming a system. Using a real contact recommender system implemented into a real professional SNS with real user data will certainly show additional insights.

5.4 Future Research

Future research needs to investigate other ways to tackle the homophily principle. For example, explanations can be designed differently, or they could even more highlight the benefits of diversity by providing examples or making use cases salient. Moreover, we think that future research should alter the types of information and for example use a combination of similarity information and dissimilarity information. Besides, in providing information the wording can be changed towards a more appealing version. Here, we also think about framing diversity more as a strength and as complement. Also, as already mentioned, the number of common contacts or contacts in other business sectors can be interpreted as how popular a person is or how likely the contact respect will be accepted. Studies assessing objective behavioral data with different types of information and different wordings such as ours can be extended with a qualitative

assessment asking how people interpret the wordings and what the reason to choose a potential business contact was. Final and most importantly, future studies should look at real contact recommender system implemented into a real professional SNS with real user data.

6. Conclusion

We conducted two experiments to investigate how different types of explanations and different types of information influence people's online networking behavior on professional social networking sites in the very moment of online networking. We find that overall similar profiles are chosen with a higher probability. Besides, an explanation why someone is recommended and thereby hinting at the benefits of diverse networking reduces the influence of similarity. Moreover, presenting information about dissimilarities in contrast to information about similarities reduces the positive influence of similarity as people heuristically look for large numbers and as a result also add profiles that are more dissimilar to them.

ARTICLE IV

Social Identification with Diverse Online Business Networks

First author: Lea Baumann

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Social Identification with Diverse Online Business Networks

Abstract

Professional social networking sites offer great opportunities when it comes to connecting with a diverse set of people that provides access to new perspectives and new information. In line with the social capital theory connecting with people with different expertise and knowledge can enhance personal work performance and career advancement, especially for knowledge workers. However, when people connect online with a diverse set of others they have never met before and with whom they do not have much in common, do they feel connected enough to be willing to offer the benefits of influence, solidarity, and information? Based on the social identity perspective as an underlying groundwork for the social capital theory, we want to investigate how people categorize, identify with, and are willing to offer support for their online business networks. Thereby we want to get insights into how diverse online business networking and connecting with dissimilar strangers might affect the benefits of social capital. We investigate our research questions with two studies ($N_1 = 400$ and $N_2 = 301$). The first study has an experimental design where participants send and accept contact requests of fake people. The second study uses an ego-centered social network analysis approach asking people about their real online business networks. The results indicate that a higher level of diversity concerning expertise and occupation leads to less self-categorization, less identification with, and less willingness to support the network. Results are discussed and implications are drawn.

1. Introduction

Professional networking is considered key to professional success. That is because professional networking is an entry point to social capital. The main idea of the social capital theory "is that social networks have value. Just as a screwdriver (physical capital) or a college education (human capital) can increase productivity […], so too social contacts affect the productivity of individuals and groups" (Putnam, 2000, pp. 18f.). A network of people can provide the benefits of access to information, influence, and solidarity, which can facilitate and influence several career outcomes, such as personal work performance, salary increases, promotions, job search, product innovation, and creativity (Adler & Kwon, 2002). As a result, social capital researchers have investigated the structure and the content with which networks have the greatest value (e.g. Burt, 1992; Burt, 2000; Granovetter, 1973). They found that especially when it comes to innovation and creativity, a diverse network is most beneficial as it gives access to non-redundant information, new perspectives, and new ideas (Baer, 2010; Burt, 2004; Kochan et

al., 2003; Parise, Whelan & Todd, 2015). Especially for knowledge workers who face the newly arising complexities of our time, the integration of different views to create new ideas, new methods, and new approaches can be crucial for professional success.

Fortunately, professional social networking sites (SNS) such as LinkedIn offer the opportunity to connect with experts from all sorts of fields and from all over the world, someone has never met before and might not even be able to meet in person. Hence, building larger and more diverse business networks can become easier with professional SNS. Yet, many people are online mainly connected with others they know from their direct work environments, such as colleagues and university friends with similar expertise, similar professions, and many contacts in common (Papacharissi, 2009; Utz & Muscanell, 2014). So far, professional SNS even support connecting with similar others by recommending people based on commonalities such as similar profile information, similar experiences, and shared connections (LinkedIn, 2020; Chamoso, Rivas, Rodríguez & Bajo, 2018). As a result, some researchers aim to encourage people to build more diverse business networks by altering the design of contact recommendations and the basis of who is getting recommended (Baumann & Utz, 2019; 2020; Gómez-Zará, Guo, DeChurch & Contractor, 2020).

However, when people now connect with a diverse set of others which they have not met personally and with which they do not have many things in common, will they still offer the same influence, solidarity, and information? Social capital research investigated the best structure and content of the network, but it has not investigated the underlying mechanism of why people help each other (Adler & Kwon, 2002; Portes, 1998). We therefore want to combine the social capital theory (SCT) with the social identity perspective (SIP). The approach to integrate the two theories has already been considered in the context of organizations (Kramer, 2006a; Kramer, 2006b). As there is a link between people's identification with a group and their willingness to support the group, the SIP can build the underlying groundwork for the SCT (Drury, Brown, González & Miranda, 2016; Hogg, Abrams, Otten & Hinkle, 2004). So far, when people in a business network are similar to each other, it is easy to identify with them as many characteristics are shared. Yet, when people are now encouraged to build diverse online business networks, the question remains whether identification with the network will be affected and reduced? Consequently, the question remains whether a potential lack of identification will result in a reduced willingness to perform supportive behavior towards the network, compromising the whole idea of the SCT? To answer the question, we conducted two

pre-registered studies[4] to examine the effect of diverse business networking on social identification with and the willingness to support the network. We wanted to examine whether networks are perceived as an entity or as different subgroups of people. Moreover, we looked at characteristics professional SNS users attribute to other people when networking online. Shared characteristics might be a reason to still identify with others in a network when expertise and occupations become more diverse.

2. Theoretical Background and Hypotheses

2.1 The Social Capital Theory

The SCT has intensely been investigated by sociologists, political scientists, and economic scientists (Svendsen & Svendsen, 2009). Different research fields, research traditions, and theoretical perspectives have led to a variety of definitions, depending on whether the focus was on the structure, the content, or the outcomes of social capital. Moreover, the research field of sociology has influenced research on social capital with an ego-centric-network perspective (Adler & Kwon, 2002). Integrating definitions from more than 20 researchers, Adler and Kwon (2002) defined social capital as "the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relations. Its effects flow from the information, influence, and solidarity it makes available to the actor" (Adler & Kwon, 2002, p. 23).

The primary form of social capital is the family, followed by the neighborhood, and all sorts of groups and clubs where people meet, hang out, discuss, and organize such as sports clubs, professional societies, literary societies, book clubs, or labor unions (Putnam, 1993; 1995). Finishing his famous essay, Putnam who is considered to be one of the original authors of social capital calls to "sort out the dimensions of social capital. What types of organizations and networks most effectively embody – or generate – social capital […] (Putnam, 1995, p. 10). Thus, the two main branches of social capital research focus on what kind of network *structure* and what kind of network *content* induce the best outcome. Research around the structural hole theory by Burt (1992; 2000), states that the formal structure of the network has an important effect on *opportunity*. The structure of the network influences the "opportunity to broker the flow of information between groups" and people who are not connected otherwise (Adler & Kwon, 2002, p. 24; Burt, 2000). Research around the weak tie theory by Granovetter (1973), on the other hand, focuses on the content of the network emphasizing the strengths of so-called weak ties in contrast to strong ties. Strong ties are family members and close friends with whom

[4] Experimental study: http://aspredicted.org/blind.php?x=7wk38j and survey study: http://aspredicted.org/blind.php?x=ku7nh8

we spent a lot of time, whereas weak ties are acquaintances, colleagues, and distant friends. Consequently, strong ties based on regular communication share the same pool of information, weak ties based on occasional communication, on the other hand, have the *ability* to provide new information and new expertise when they are contacted (Granovetter, 1973).

Research has shown that a network of people providing information, influence, and solidarity can influence several career outcomes such as finding a new job (Porter, Woo & Campion, 2016; van Hoye, van Hooft & Lievens, 2009; Yakubovich 2005), general career success with an increase of personal work performance, salary increases, promotions, and status attainment (Cross & Cummings, 2004; Ng, Eby, Sorensen, Feldman, 2005; Seibert, Kraimer & Liden, 2001; Sparrowe, Liden, Wayne & Kraimer, 2001; Wolff & Moser, 2009; 2010), and product innovation and creativity (Baer, 2010; Perry-Smith 2006; Sosa, 2011). Especially when it comes to innovation and creativity, a low inter-connected and highly diverse network with respect to expertise and occupations is most beneficial as it gives access to non-redundant information, new perspectives, and new ideas (Burt, 2004; Eagle, Macy & Claxton, 2010; Parise, Whelan & Todd, 2015).

However, one question remains unanswered: why? Within the research field of the SCT, there is almost no research investigating the underlying motivation why exactly people are willing to offer information, influence, and solidarity to others in their networks. Coming from an economic perspective, many researchers have considered individuals as "rational actors" and "have implicitly assumed that individual and collective actors are driven by instrumental motivations" (Adler & Kwon, 2002, p. 25). These motivations are based on the rational calculation of creating dyadic obligations to ensure that given support will eventually be returned. Hence, these motivations are based on norms and trust created by a rational, economic system of inter-dependencies. Consequently, a frequently used measure of social capital is people's levels of norms and trust. According to Engbers, Thompson, and Slaper (2016), the simple forms to measure social capital are by assessing people's formal membership in clubs and groups and people's levels of altruism and political engagement. The latter one based on the idea that when people are involved in charity and politics they are connected with others. In many cases, however, social capital is measured by assessing people's level of shared norms and trust within a community. Measuring social capital as the levels of shared norms and trust certainly comes from Coleman's (1988) and Putnam's (1995) definitions of norms and trust as forms of social capital. Putnam (1995, p. 2) states that social capital "refers to features of social

organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit."

In contrast to the mere economic perspective and following the idea of cooperation for mutual benefit another approach is to regard motivation to be based on a general sense of community. Motivation that is also based on norms and trust but deeply internalized norms and trust of generalized reciprocity where support is not quantified and the time for potential return is indefinite. This type of reciprocity is learned "through socialization in childhood or through experience later in life by the experience of a shared destiny with others" (Adler & Kwon, 2002, p. 25 after Portes, 1998). Moreover, Putnam (1995) describing the primary form of social capital as the family, the neighborhood, and groups and clubs where people meet, hang out, discuss, and organize, completes the list by adding "groups and clubs that broaden the participants' sense of self, developing the "I" into the "We"" (Putnam, 1995, pp. 2 f.). When finishing his essay by calling to "sort out the dimensions of social capital" he added "in the sense of mutual reciprocity, the resolution of dilemmas of collective action, and the broadening of social identities (Putnam, 1995, p. 10). Therefore, we propose to combine the SCT with the SIP from Tajfel and Turner (1979; 1986) and Turner, Hogg, Oakes, Reicher, and Wetherell (1987) making social identification with a group the underlying groundwork for the SCT.

2.2 The Social Identity Perspective

The SIP consisting of the social identity theory by Tajfel and Turner (1979; 1986), later complemented by the self-categorization theory by Turner et al. (1987), is a social psychological perspective on group membership, intra- and inter-group relations, and the self-concept, applicable to "small and large groups, interactive and noninteractive groups, and task-oriented and self-definitional groups" (Hogg et al., 2004, p. 247; Hornsey, 2008). The social identity theory acknowledges that people do not only derive their self-concept from their personal identity based on interpersonal comparison but also from their *social identity,* based on their membership in "a social in-group as defined against other groups of humans" (Hornsey, 2008, p. 208). The self-categorization theory, on the other hand, describes the underlying cognitive process, the so-called cognitive self-categorization, that causes people to define themselves as a member of a group. According to the self-categorization theory, self-categorization depends on both accessibility and fit (Oakes, 1987; Oakes, Turner & Haslam, 1991).

On the one hand side, people use *accessible* categories such as innate categories (e.g. gender, ethnicity, etc.) as well as social categories (e.g. profession, party affiliation, etc.) "to make sense of the social context, in terms of people's attitudes [and] behaviors" and to use the categories as a basis for self-categorization into a social group (Hogg et al., 2004, p. 255). Those "categories may be fleetingly accessible if they are primed in the situation, or they may be chronically accessible if frequently activated or if people are motivated to use them" (Hornsey, 2008, p. 208). *Fit*, on the other hand, refers to the extent to which people perceive the distinction into categories to be the reason for similarities and differences between people. In other words, how much of similarities and differences between people can be explained through the distinction in categories. People "perceive a high level of fit if the category distinction maximizes the perceived inter-category differences and minimizes the perceived intra-category differences (comparative fit)." People also perceive a high level of fit "if social behavior and group membership are in line with stereotypical expectations (normative fit)" (Hornsey, 2008, p. 208). Hence, social identity is "anchored in valence-sensitive social comparisons that strive for similarity within groups and differentiation between groups (Hogg et al., 2004, p. 258; Hogg, 2000; Oakes, 1987; Oakes, Turner & Haslam, 1991).

Once self-categorized into a group, people differentiate between the in-group and the out-group. Self-categorization into a group "changes the way people see themselves, in the sense that it activates a different level of one's self-concept" (Hornsey, 2008, p. 206). Consequently, "people construct group norms from appropriate [or prototypical] in-group members and in-group behaviors and internalize and enact these norms as part of their social identity" (Hogg et al., 2004, p. 249). In general, groups are cognitively represented as prototypes. Prototypes are constructed to emphasize group entitativity meaning the extent to which a group is perceived to be a distinctive entity (Campbell, 1958). Following the principle of minimizing intra-group and maximizing inter-group differences and "because prototypes also describe and prescribe group-appropriate ways to feel and behave, you feel and behave normatively. In this way, self-categorization also produces, within a group, conformity and patterns of in-group liking, trust, and solidarity" (Hogg et al., 2004, p. 254). Hence, the SIP has been used to explain various phenomena including social influence, conformity to group norms and solidarity within groups (e.g. Drury et al., 2016; Hogg & Reid, 2006; Reicher, Cassidy, Wolpert, Hopkins & Levine, 2006; Terry & Hogg, 1996; Turner, 1991; van Vugt & Hart, 2004).

As criticism, however, Hogg et al. (2004, p. 260) claim that "researchers have paid little attention to the fact that groups are not homogeneous". Usually, "groups are internally structured in terms of roles, subgroups, nested categories, crosscutting categories, and so forth." Studies have shown that, for instance, cultural differences within groups can undermine group identification (e.g. Luijters, van der Zee & Otten, 2008; Milliken & Martins, 1996). However, there is also some research pointing in the opposite direction. For example, people can combine categories in complex ways when more than one category for group membership becomes simultaneously salient or accessible. Moreover, people can switch between categories by recategorization and they can also only identify with a subset of a larger group (Crisp, Ensari, Hewstone & Miller, 2002; Crisp, Hewstone & Cairns, 2001; Crisp, Hewstone, Richards & Paolini, 2003; Crisp, Stone & Hall, 2006).

Furthermore, studies have revealed that within-group differences can foster identification when people use individual differences as a basis to identify. That is because there are two paths of identity formation (Postmes, Haslam & Swaab, 2005). On the deductive path, social identity formation is influenced by similarities and shared categories in a top-down process. On this path, homogeneity facilitates identity formation while heterogeneity undermines it. On the inductive or bottom-up path, on the other hand, identity formation is induced based on individual expressions by group members. Hence, "while members of homogenous groups can form a strong social identity by a process of sharing similarities, members of heterogeneous groups can form a strong social identity by a process of sharing individual differences, or individuality" (Jans, Postmes & van der Zee, 2012, p. 1145; Homan, van Knippenberg, van Kleef & De Dreu, 2007; Jetten, McAuliffe, Hornsey & Hogg, 2006; Jetten, Postmes & McAuliffe, 2002). Moreover, on both paths, the level of support for the group is in line with the level of identification with the group (Jans, Postmes & van der Zee, 2012). Altogether, diversity does not necessarily prevent identification. In diverse groups people can either combine categories in complex ways and individually identify with different subsets or they can use within-group diversity, individualism, and individual expressions as a reason to identify.

2.3 Benefits of Integrating the Two Theories

Interestingly right from the start, both theories coming from the field of social psychological research share many concepts. As early as Putnam (1995, pp. 2f.) himself speaks of social capital as something based on groups that develop the *I* into the *We* by broadening social identities (Putnam, 1995). Moreover, besides all negative effects of the SIP such as prejudice,

discrimination, and crowd violence (e.g. Hodson, Dovidio & Esses, 2003; Klein, Licata, Azzi & Durala, 2003; Stott & Drury, 2016; Stott, Hutchison & Drury, 2001; Vider, 2004) on the positive side, in-group favoritism enables social influence and solidarity (e.g. Drury et al., 2016; Hogg & Reid, 2006; Reicher et al., 2006). Influence and solidarity, however, are also considered to be the benefits of social capital (Adler & Kwon, 2002). Furthermore, according to Hogg et al. (2004, p. 254) self-categorization into a group leads to conformity to group norms and trust with the group. Norms and trust have already been claimed to be basic theoretical concepts of the SCT by Coleman (1988), Putnam (1995), and Portes (1998). Besides, as social capital has been measured with people's extent of shared norms and trust within a community, norms and trust are equated with social capital (see Engbers, Thompson & Slaper, 2016).

Moreover, the approach is to combine the SCT with the SIP has already been theorized in the context of organizations (Kramer, 2006a; Kramer, 2006b). In his articles Kramer (2006a; 2006b) reviews experimental and field studies to develop a "framework for conceptualizing how individuals' psychological identification with a collective enhances their willingness to engage in behaviors that contribute to the creation and maintenance of social capital" (Kramer, 2006b, p. 25). After reviewing plenty of studies, he argues that "viewed in aggregate, the results of these laboratory experiments and field studies converge on the conclusion that social and contextual cues that make salient or otherwise activate individuals' collective identities enhance the propensity to engage in those forms of collectively oriented behavior directly implicated in the creation of social capital" (Kramer, 2006a, p. 8).

2.4 Barriers to Integrating the Two Theories in a Professional Online Setting

In the realm of social psychological research, on a general offline level, and for organizational settings, the two theories can be combined very easily. Having said this, we now want to transfer the integration of the two theories to a professional SNS setting with a communication research perspective. Hence, three obstacles emerge: first, offline becomes online, second the usage of platforms for professional networking gets involved, and finally clear organizational/group structures become highly individual business networks. In the following we want to address these obstacles, reflect their severity, and think of how to deal with them. Concerning the first obstacle being offline become online there have been many studies investigating both the SCT and the SIP in online settings. On the one side, research has found that online business contacts also contribute to a person's social capital (e.g. Cheng, Wang, Sigerson & Chau, 2019; Domahidi, 2018; Utz & Breuer, 2016; Utz, 2016). On the other side, the SIP, too, applies to

online groups such as online communities and forums (e.g. Chiu, Huang, Cheng & Sun, 2015; Dholakia, Bagozzi & Pearo, 2004; Qu & Lee, 2011; Ren et al., 2012) and groups on social networking sites (e.g. Chung, Nam & Koo, 2016; Morin & Flynn, 2014). Concerning professional SNS there is also one study by Chiang, Suen, and Hsiao (2013) who investigate the SIP within a LinkedIn group. Transferring the two theories to an online setting, therefore, does not seem to be a problem.

Apart from a general level, where both theories can be transferred to online settings, our research, however, has a more specific focus on networking with professional SNS. In contrast to joining an online group, we focus on building a business network with the help of professional SNS. On professional SNS people can both proactively send out contact requests (i.e. proactive online networking) and actively decide whether to accept or decline contact requests from others (i.e. reactive online networking). Moreover, with contact recommendations, professional SNS offer the opportunity to connect with experts from all sorts of fields and from all over the world, someone has never met before and might not even be able to meet in person. Yet, many people are online mainly connected with others they know from their direct work environments and as a matter of fact, professional SNS support connecting with similar others by recommending people based on commonalities (Chamoso et al., 2018; LinkedIn, 2020; Papacharissi, 2009; Utz & Muscanell, 2014). As a result, some researchers aim to encourage people to build more diverse business networks by changing the design of contact recommendations and the basis of who is getting recommended (Baumann & Utz, 2019; 2020; Gómez-Zará et al., 2020). When changing the design of contact recommender systems, one consideration is to change the presented information. Current contact recommender systems emphasize commonalities such as common contacts, events, groups, and universities as a reason to connect. In the context of diverse business networking, one idea is to emphasize dissimilarity information. However, making similarities or dissimilarities salient might influence how people categorize themselves and the other person to be in the same in-group and as a result influence the social identification with the resulting network.

Finally, we want to address the last and predominant obstacle being clear organizational/group structures become highly individual business networks. What all studies concerning the SIP in offline and online settings have in common is that they apply to groups with clear group boundaries. Both in organizational contexts as well as in online group contexts, it is easily recognizable who is a member and who is not a member of the group. Business networks on

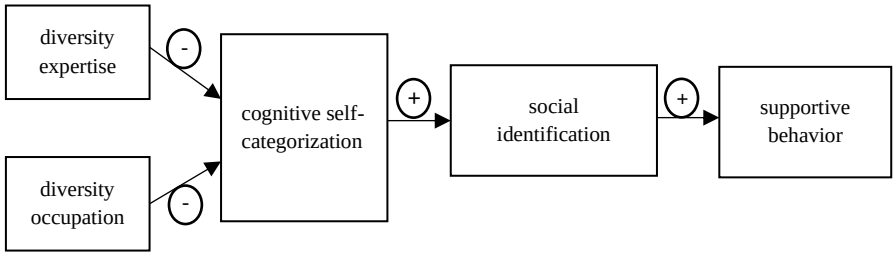
professional SNS, to the contrary, are highly individual aggregations of people as every user creates their very own business network. There might be overlaps with someone else's business network, but overlaps do not necessarily exist. Moreover, those overlaps might not be visible. Hence, there is a need to examine how business networks are perceived and defined regarding "who is inside and thus benefits from social capital, and who is outside and does not" (Putnam, 1993). Consequently, there is a need to assess whether people perceive their networks to be distinctive and coherent groups meaning their perception of group entitativity. Besides, Putnam (1995) did explicitly state that social capital does not come from groups and clubs where people only donate money to or occasionally receive a newsletter. The benefits of social capital only come from groups and clubs where people meet, hang out, discuss, and organize because people must be aware of each other's existence. In general, this applies to online groups such as online forums, groups on SNS, and guilds and clans. Here, people at least virtually meet, hang out, discuss, and organize. On the other hand, according to Hogg et al. (2004, p. 247) the SIP can be applied to "small and large groups, interactive and noninteractive groups, and task-oriented and self-definitional groups." Hence, for the SIP, there is no specific need for interaction for people to self-categorize and identify with a group. Concerning professional SNS, the individual aggregation of people in online business networks can be considered as somewhere in-between interactive and non-interactive groups. People within a business network can interact with one another, for example in discussions under a post. However, the post and the individual contributions to the discussion are only seen by a selected group of people depending on who joins the discussion.

2.5 Hypotheses

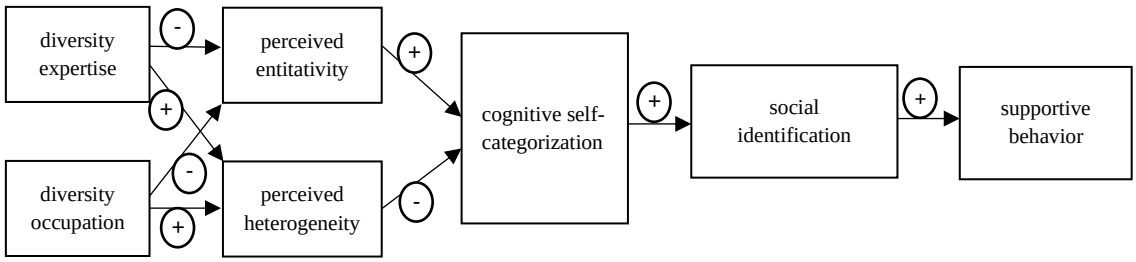
Based on the theoretical considerations of the previous chapters we propose five hypotheses. First, when contact recommendations emphasize dissimilarity information to encourage people to build more diverse business networks, we expect H1: When similarity information is emphasized within the presentation of contact recommendations and contact requests, people will identify more with the assembled business network and show more willingness to perform supportive behavior than when dissimilarity information is emphasized. Second, when clear group boundaries are missing and when people can differently identify with different subsets, we assume that there is a difference in the perception of who belongs to the group depending on who sent the contact request. When people network proactively meaning when they send out contact requests, they can choose who to invite into their personal business network meaning they can decide who belongs to the group. On the other hand, when people reactively

network meaning when they accept contact requests from others their ability to decide is limited as they can only react to the contact request they receive. Hence, we expect H2: When people network proactively (i.e. send out contact requests), they will identify more with the assembled business network and show more willingness to perform supportive behavior than when they network reactively (i.e. receive and accept contact requests).

Moreover, when professional SNS users do network more diverse concerning expertise and occupation we expect H3: When people network more diverse concerning expertise and occupation, they will identify less with the assembled business network and show less willingness to perform supportive behavior than when they network less diverse. Furthermore, taken everything together, we want to investigate the overall relation between diverse networking, self-categorization, social identification, and the willingness to support the network with two control influences of perceived network entitativity and perceived network heterogeneity. We propose the following model of H4:



Remembering the variety of measurements of social capital, interestingly to mention is that Engbers, Thompson, and Slaper (2016, p. 547) state that "given the difficulty of measuring shared norms, scholars have tended to default to measures of homogeneity and conversely diversity." Besides party affiliation and religiosity, researchers have "mostly [been] focusing on demographic homogeneity as a proxy for shared norms." Consequently, a diverse business network compared to a homogeneous one by measurement definition counts as less social capital. In addition to perceived entitativity as a control variable, we also want to assess how heterogeneous people perceive their assembled business networks to be. Consequently, the model of H4 will now become H4a with the extension to H4b including control variables:



Finally, when people network more diverse concerning expertise and occupation and those easily identifiable categories for self-categorization become absent, people might use other categories. Based on the idea that social identification can also be based on shared values, we assume that people will attribute others with characteristics of their own. For example, many people use professional SNS for career advancement reasons, so in the absence of formal categories such as similar expertise and similar occupation, they might attribute other users with a career orientation characteristic. Our last hypothesis, therefore, is H5: People attribute others in their networks with characteristics of their own.

3. Experimental Study

3.1 Methodology Experimental Study

3.1.1 Design and Sample

The experimental study had a 2x2x2 design. The first experimental factor was a between-subject-factor that referred to the networking order (pro first vs. re first). Participants either started with proactive networking seeing 24 contact recommendations of fake people (in the following called *profiles*) to send out contact requests followed by reactive networking. Or participants started with reactive networking by answering (accept or ignore) six contact request followed by proactive networking. The second experimental factor was a within-subject-factor referring to the presented profiles (similar vs. dissimilar to the participant – more information on that in the materials section). The third experimental factor was another between-subject-factor that defined the type of presented information (similarity information vs. dissimilarity information). Professional SNS usually display similarity information such as common contacts, events, or groups with the recommendation. Hence, we included a similarity condition making commonalities of the profile with the participant salient. However, within the idea of encouraging people to build more diverse business networks, we additionally included a condition with a focus on dissimilarities between the profile and the participant. Participants were randomly assigned to one of the four between-subject conditions.

The sample was recruited via Prolific. We invited English-speaking participants who were at least 21 years old. Hence, the sample consisted of 400 people living in the UK (65 percent) and the US (35 percent), with a mean age of 33 years (ranging from 21 to 67; *median* = 31, *SD* = 9.92). Gender was slightly unbalanced with 59 percent female and 41 percent male participants. To participate they needed to have an account on a business networking site to be familiar with how those sites work (concerning the sending and receiving of contact requests

and the recommendation of business contacts). 77 percent were employed within an organization, 12 percent were self-employed, and 11 percent were job-seeking.

3.1.2 Procedure

The online experiment was created as an HTML-file to implement a mock-up business networking site in the questionnaire. The study contained many filler tasks to distract participants from the real research intention. Participants were told that the study investigated modern working life. Hence, they worked on several tasks such as extracting information from a diagram, answering questions concerning their soft skills and their work values. After the distractions, the mock-up business networking sites were introduced with a neutral statement that in their free time, they wanted to check on their account to see who was getting recommended or who was sending them a contact request. Hereafter, participants saw 24 profiles as contact recommendations in the proactive networking part and six contact requests in the reactive networking part. Participants did not need to network and there was no minimum time they had to wait to continue to the next page. When participants clicked on a connect or accept button, they saw feedback that a contact request was sent or that the contact request was accepted. A screenshot of the mock-up business networking site is shown in Figure 1.

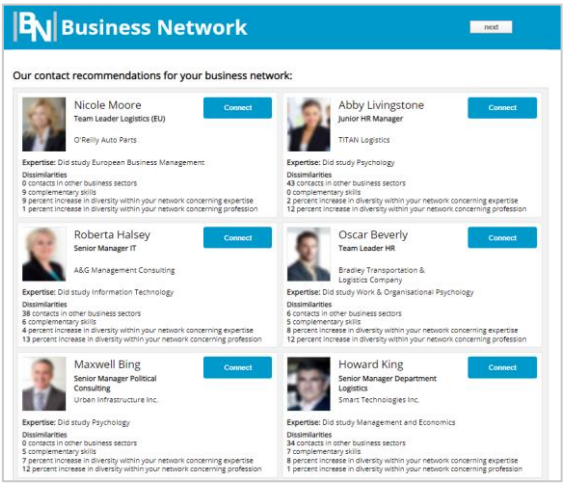


Figure 1: Screenshot of the mock-up business networking site presenting the first six contact recommendations of 24 in the dissimilarity information condition. The design of the contact requests was the same.

3.1.3 Materials

For the contact recommendations and contact requests, we created 164 profiles by automatically mixing different names, study courses, jobs, and companies from a database combined with randomly attributed numbers of fake commonalities or dissimilarities. The profiles were assembled in six sets of 24 profiles (proactive networking) and six sets of six profiles (reactive networking) to rotate profiles, profile combinations, and profile positions between participants. Every participant was randomly assigned to one of the six sets in both the proactive and the reactive networking part. Moreover, profile photos were randomly allocated in each set and blurred to rule out any influence. Gender and hierarchical levels (junior, intermediate, or senior

level) of the profiles were balanced within the sets. The profiles differed in their expertise (study course), their occupation (the combination of job and company), and their fake commonalities/dissimilarities with the participant. Those were: number of common contacts vs. number of contacts in other business sectors, number of common skills vs. number of complementary skills, percent increase in uniformity within your network concerning expertise vs. percent increase in diversity within your network concerning expertise, and percent increase in uniformity within your network concerning profession vs. percent increase in diversity within your network concerning profession (the latter two based on Gómez-Zará et al., 2020). Between the similarity and dissimilarity conditions, the profiles including name, study course, profession, and numbers were the same, only the wording behind the numbers changed.

3.1.4 Dependent Variables

As dependent variables, we assessed three different social identification measures with previously established items adapted to the context of online networking with professional SNS. All of them were assessed twice. Once after the first networking part and once after the second networking part. The first assessment only focused on the business network that has been assembled with the first networking part which was either proactive or reactive networking depending on the experimental condition of networking order. The second assessment focused on the overall business network that has been assembled with both networking parts. The social identification measures were the following: supportive behavior towards the newly built network (i.e. how much people are willing to support the network for example by sharing information) with items by Qu and Lee (2011) (Cronbach's $\alpha_{first} = 0.84$; $\alpha_{overall} = 0.87$); social identification with the newly built network (i.e. how much people identify with the network) with items by Postmes, Haslam, and Jans (2013) and Qu and Lee (2011) ($\alpha_{first} = 0.83$; $\alpha_{overall} = 0.87$); cognitive self-categorization (i.e. how much people see an overlap between their identity and the network's identity) with items by Ellemers, Kortekaas, and Ouwerkerk (1999) and Henry, Arrow, and Carini (1999) ($\alpha_{first} = 0.79$; $\alpha_{overall} = 0.81$). All dependent variables were assessed with 5-point-Likert-scales.

3.1.5 Independent Variables

The independent variables were how many profiles were chosen by the participant with values ranging from zero to 24 for proactive networking and values ranging from zero to six for reactive networking. Moreover, we calculated the diversity of the newly built networks every participant assembled with Blau's index (1977) of heterogeneity (for an overview on diversity

measures see Harrison & Klein, 2007). Blau's index was calculated for network diversity concerning expertise and concerning occupation, both times in the standardized form, divided by the maximum that would have been possible. Hence, values ranged from zero to one, with low values meaning that profiles' expertise and occupation fell into the same category, high values meaning that profiles' expertise and occupation did fall into different categories. We did not combine the two values into one diversity score as diversity is attribute specific. A group or assembled business network can be diverse concerning one attribute and at the same time not be diverse concerning another attribute (Harrison & Klein, 2007). The diversity was calculated for the first networking part and for the overall network that has been assembled with both networking parts.

3.1.6 Control Variables

As control variables, we assessed perceived network entitativity with items by Blanchard, Caudill, and Walker (2018) (α_{first} = 0.83; $\alpha_{overall}$ = 0.88) and perceived network heterogeneity with items by Campion, Medsker, and Higgs (1993) and Leach et al. (2008) (α_{first} = 0.78; $\alpha_{overall}$ = 0.82). All control variables were assessed with 5-point-Likert-scales.

3.1.7 Manipulation Check

We included four manipulation check items asking how much participants empathized with the scenario. Participants who failed the manipulation check were excluded from data analysis. The final sample consisted of 359 participants.

3.2 Results Experimental Study

3.2.1 Descriptive Statistics

Descriptive statistics and all intercorrelations of the first and the second assessment of the experimental study can be found in Tables 1A and 1B.

3.2.2 Hypotheses Testing

With the experimental study, we were able to test hypotheses one to four. To test hypotheses one, two, and three we conducted two regression analyses with the dependent variables of social identification with and the willingness to support the network of the first assessment. As predictors, we used the experimental factors of networking order (pro first vs. re first – regarding the first assessment only defining the networking mode proactive vs. reactive) and of presented information (similarity information vs. dissimilarity information). Also, we used the

	variable	*M (SD)*	1	2	3	4	5	6	7
1	number added first (pro OR re)	4.79 (3.62)							
2	diversity expertise first (pro OR re)	0.67 (0.30)	0.36 ***						
3	diversity occupation first (pro OR re)	0.66 (0.34)	0.36 ***	0.74 ***					
4	supportive behavior first	3.82 (0.72)	0.07	0.01	0.02				
5	social identification first	3.51 (0.74)	-0.01	0.04	-0.01	0.59 ***			
6	self-categorization first	3.44 (0.77)	-0.08	-0.02	-0.10	0.45 ***	0.73 ***		
7	network entitativity first	3.29 (0.84)	-0.04	-0.06	-0.05	0.47 ***	0.64 ***	0.51 ***	
8	network heterogeneity first	2.61 (0.86)	0.07	0.00	0.12 *	-0.20 ***	-0.38 ***	-0.49 ***	-0.45 ***

Table 1A: Descriptive statistics and correlation matrix of all measures of the first assessment (first networking social identification measure).
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

	variable	*M (SD)*	1	2	3	4	5	6	7
1	number added overall (pro & re)	11.08 (6.31)							
2	diversity expertise overall (pro & re)	0.73 (0.18)	0.47 ***						
3	diversity occupation overall (pro & re)	0.72 (0.22)	0.41 ***	0.46 ***					
4	supportive behavior overall	3.91 (0.75)	0.00	0.03	0.09				
5	social identification overall	3.51 (0.77)	-0.05	0.02	-0.05	0.64 ***			
6	self-categorization overall	3.37 (0.80)	-0.06	0.04	-0.11 *	0.45 ***	0.76 ***		
7	network entitativity overall	3.38 (0.85)	-0.05	0.03	-0.03	0.54 ***	0.75 ***	0.62 ***	
8	network heterogeneity overall	2.57 (0.87)	0.06	-0.02	0.19 ***	-0.29 ***	-0.49 ***	-0.60 ***	-0.54 ***

Table 1B: Descriptive statistics and correlation matrix of all measures of the second assessment (overall networking social identification measure).
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

diversity indices concerning expertise and occupation of the assembled networks of the first networking part. The results can be seen in Table 2. The results become clearer when we compare mean values between the different experimental conditions. Concerning proactive and reactive networking we did not find a difference for either of the dependent variables. Mean values of social identification with the network for proactive networking (M = 3.51, SD = 0.73) and reactive networking (M = 3.51, SD = 0.75) were the same.

	social identification		**supportive behavior**	
predictor	**B**	**SE B**	**B**	**SE B**
intercept (reactive / similarity information)	3.45 ***	0.16	3.71 ***	0.15
proactive networking	-0.01	0.10	0.03	0.09
dissimilarity information	0.08	0.08	0.15 #	0.08
diversity expertise (first)	0.22	0.19	-0.01	0.19
diversity occupation (first)	-0.17	0.18	0.07	0.17

Table 2: Linear regression analyses: Dependent variable: social identification (first assessment) or supportive behavior (first assessment). Independent variable: experimental factor of networking order (pro first vs. re first), experimental factors of presented information (similarity information vs. dissimilarity information), diversity index expertise, and diversity index occupation. Levels of significance: # $p < .01$; * $p < .05$; ** $p < .01$; *** $p < .001$

Also, the mean value of people's supportive behavior for proactive networking (M = 3.83, SD = 0.68) did not differ from the mean value of reactive networking (M = 3.81, SD = 0.77). Hypothesis two, therefore, needs to be rejected. Concerning the presented information, we did not find any difference between the experimental conditions either. The mean value in the similarity information condition for social identification (M = 3.56, SD = 0.73) was only descriptively higher than in the dissimilarity information condition (M = 3.47, SD = 0.74). When looking at supportive behavior there was a small difference, however, in the opposite direction as expected. People showed more willingness to support the network in the dissimilarity information condition (M = 3.91, SD = 0.67) than in the similarity information condition (M = 3.73, SD = 0.76). Hence, hypothesis one needs to be rejected. For hypothesis three, there was no effect of neither of the diversity indices on neither of the dependent variables, so hypothesis three was rejected.

Finally, we calculated two path models with all measures of the second assessment referring to the overall network to test our models of hypotheses four A and four B. The results can be seen in Figures 2 and 3. In the small model, network diversity influenced cognitive self-categorization with the network which in turn led to more social identification with and more supportive behavior towards the network. All directions of influence were as expected, except

for the positive influence of diversity concerning expertise on cognitive self-categorization. While diversity concerning occupation had a negative influence, as it was expected, diversity concerning expertise had a positive influence.

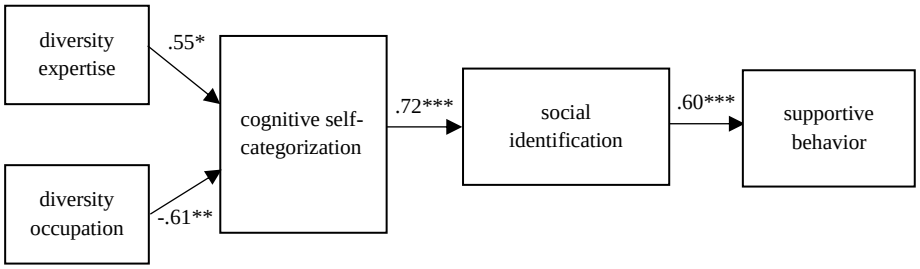


Figure 2: Results for the small path model: chi-square = 12.34, $p < .05$; $df = 5$; $N = 352$; comparative fit index (CFI) = .99; Tucker-Lewis Index (TLI) = .97; root mean square error of approximation (RMSEA) = .065. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

In the large model, again cognitive self-categorization positively influenced social identification with the network which in turn positively influenced supportive behavior towards the network. Moreover, perceived entitativity of the network positively influenced cognitive self-categorization and perceived heterogeneity of the network negatively influenced cognitive self-categorization as expected. For network diversity, which was supposed to negatively influence perceived entitativity and positively influence perceived heterogeneity, we see that this was only true for diversity concerning occupation. Diversity concerning expertise, like in the small model, revealed different directions of influence than expected. Furthermore, not all paths between network diversity, perceived entitativity, and perceived heterogeneity were significant. Altogether, the small model had a better fit than the large model.

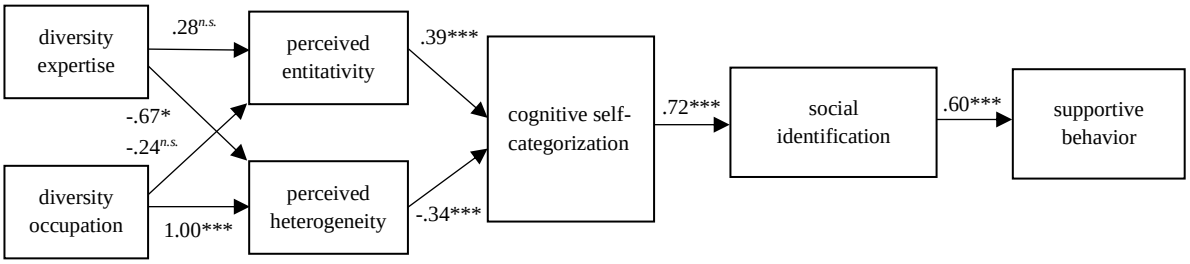


Figure 3: Results for the large path model: chi-square = 146.31, $p < .001$; $df = 11$; $N = 352$; comparative fit index (CFI) = .87; Tucker-Lewis Index (TLI) = .75; root mean square error of approximation (RMSEA) = .187. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

3.3 Discussion Experimental Study

The experimental study showed that social identification with and support towards the network were not directly related to who sent the contact request and what type of information was presented. When similarity information was presented, social identification was only descriptively higher than when dissimilarity information was presented. Regarding people's willingness to support the network, the effect was even in the opposite direction meaning that people were more willing to support the network when dissimilarities were emphasized. On the one hand side, this was against our expectations with respect to the SIP, on the other side, this might be the case because people think that dissimilar others are more likely to need their help than similar others. Concerning networking mode (proactive vs. reactive), our assumption was not supported either. We expected a higher social identification and a higher willingness to support the network when people were sending out contact requests. That is because when sending out contact requests, people can freely choose who to include in their networks. When answering contact requests from others, this freedom of choice is limited to the people who sent a contact request. The results did not support the assumption. Apparently, in an experimental setting with fake profiles, people do not distinguish between a network of people they proactively chose and a network of people they reactively chose.

Moreover, network diversity did not directly influence social identification and willingness to support the network as it was expected. However, in the small path model, there were mediated paths via cognitive self-categorization. Diversity concerning occupation did negatively influence people's cognitive self-categorization, which in turn positively influenced social identification which positively influenced people's willingness to support the network. Hence, when people network more diverse concerning occupation, they will less self-categorize themselves into the network, less identify with the network, and be less supportive of the network. However, diversity concerning expertise did not show the same pattern as it had a positive influence on cognitive self-categorization. The only reason we can think of is that all the expertise of the fake profiles were academic educations. There were nine different categories of expertise (e.g. an economic study course, a technical study course, a social science study course, a natural science study course, etc.). What they all had in common was that they were all study courses. Maybe people did not perceive the network to be diverse concerning the different types of expertise but rather to be uniform with respect to the level of education. Maybe people perceived the network to be a homogeneous group with the common ground of being highly educated. This assumption is also supported by the large path model. Here,

diversity concerning expertise had a positive effect on perceived network entitativity and a negative effect on perceived network heterogeneity which was expected to be vice versa.

The path models revealed that even in an experimental setting where people had to empathize with a scenario and network with a mock-up business networking website, there were associations between network diversity and the resulting social identification as well as willingness to support the network. Hence, we further wanted to investigate our results with a survey study asking people about their real online business networks.

4. Survey Study (Ego-Centered Social Network Approach)

4.1 Methodology Survey Study

4.1.1 Design and Sample

The second study was a survey study with an ego-centered social network analysis approach. We asked participants to name five people from their real online business networks according to the following name generators: Name at least one person you sent the contact request to; from whom you have accepted the contact request; with different expertise, with a different occupation; and finally, name at least one person you only know online. Participants had to answer questions about these people, their online business networks in general, and themselves. More details on the design of the questionnaire can be found in the procedure section.

The sample was recruited via Prolific. We invited English-speaking participants who were at least 21 years old and who were actively using a professional SNS account. Hence, the sample consisted of 301 people living in the UK (85 percent) and the US (14 percent), with a mean age of 33.6 years (ranging from 20 to 67; *median* = 30, *SD* = 11.28). 53percent of participants were female and 47 percent were male. 80 percent were employed within an organization, 8.33 percent were self-employed, and 11.67 percent were currently job-seeking.

4.1.2 Procedure

The questionnaire was created as an HTML-file to implement an ego-centered social network assessment. At the beginning of the questionnaire, participants answered questions about their online business networks in general as well as concerning five personal characteristics. Afterward, participants had to name five individuals from their online business networks according to the name generators. In the subsequent part, we asked about participants' social identification with and willingness to support the five persons individually. Here, all five

persons were displayed next to each other so participants could weight their answers between them. The same applied to four questions concerning the formal features, which have already been the basis of the name generators. These questions were who initiated the connection, who had different expertise and a different occupation, and finally who was only known online. With these questions, the formal features were linked to the five individuals. However, all features were linked to all individuals not only to the one person that qualified for the name generator. Consequently, we assessed all formal features for every individual always offering the fallback option of "I do not know". In aggregate, all individuals qualifying for the corresponding features were considered as small subset or as representatives of a subset for the respective features. Finally, participants answered questions about the five characteristics they have already answered for themselves, this time, however, for each of the five persons.

4.1.3 Dependent Variables

As dependent variables we assessed the same three social identification measures as in the experimental study which were supportive behavior with items by Qu and Lee (2011) (Cronbach's $\alpha = 0.88$); social identification with items by Postmes, Haslam, and Jans (2013) and Qu and Lee (2011) ($\alpha = 0.90$); and cognitive self-categorization with items by Ellemers, Kortekaas, and Ouwerkerk (1999) and Henry, Arrow, and Carini (1999) ($\alpha = 0.80$). The three social identification measures were again assessed twice. One time for the whole network at the beginning of the questionnaire with the scales mentioned above and one time for the five people in specific with one item per person. For the five persons only social identification and the willingness to support were assessed. Moreover, we assessed five personal characteristics of the five named individuals. With one item each, participants had to estimate five characteristics for everyone. The five characteristics were the levels of career orientation, of friendship orientation, of impression management pursuits, of people's knowing about the benefits of networking, and of anxiety towards unknown people. All dependent variables were assessed with 5-point-Likert-scales.

4.1.4 Independent Variables

As independent variables, we assessed two diversity measures about participants' networks in general. The first one was the level of diversity concerning expertise, the second one was the level of diversity concerning occupation. Participants had the rate the diversity of their networks on a spectrum from zero to 100 percent in steps of ten which were later divided by two, so the scale ranged from zero to five. Moreover, we assessed the formal features of the name

generators for the five named individuals as already described in the procedure section. Finally, as an independent variable we assessed the five personal characteristics for the participant with four items each. The personal characteristics were career orientation with items by Hippler and Krüger (2014) (α = 0.78); friendship orientation at work with items by Randel and Ranft (2007) and Pöhlmann and Brunstein (1997) (α = 0.90); knowing about the benefits of networking with items by Baumann and Utz (2019) (α = 0.87); impression management with items by Bolino and Turnley (1999) (α = 0.76); and anxiety towards unknown people with items by Mattick and Clarke (1998) (α = 0.89). Independent variables were assessed with 5-point-Likert-scales.

4.1.5 Control Variables

As control variables, we assessed perceived network entitativity with items by Blanchard, Caudill, and Walker (2018) (α = 0.90) and perceived network heterogeneity with items by Campion, Medsker, and Higgs (1993) and Leach et al. (2008) (α = 0.78) for the whole network in general. All control variables were assessed with 5-point-Likert-scales.

4.2 Results Survey Study

4.2.1 Descriptive Statistics

Descriptive statistics and all intercorrelations of the dependent, independent, and control variables for the whole network as well as the five characteristics of the participants can be found in Table 3.

4.2.2 Hypotheses Testing

With the survey study we could test hypotheses two, three, four, and five. To test hypotheses two and three we reorganized our data set so that the five named individuals per participants were now treated like one observation each. We calculated two linear mixed model regression analyses, one for each dependent variable of social identification and willingness to support the network. As fixed-effect predictors, we used the formal features of who sent the contact request (participant meaning proactive networking or other person meaning reactive networking), similar or different expertise, and similar or different occupation. As random effects, we accounted for the hierarchical structure of the data (social identification and willingness to support nested within participants across all named individuals). Results are in Table 4. Again, the results become clearer when we compare mean values between the different subgroups. Participants socially identified more with proactively added people (M = 3.28, SD = 1.09) than with reactively added people (M = 2.85, SD = 1.17). Also, they showed more willingness to

	variable	*M (SD)*	1	2	3	4	5	6	7	8	9	10	11
1	supportive behavior	2.64 (1.09)											
2	social identification	2.87 (0.97)	0.59***										
3	self-categorization	3.02 (0.80)	0.41***	0.51***									
4	perceived entitativity	2.60 (0.94)	0.57***	0.58***	0.33***								
5	perceived heterogeneity	3.33 (0.50)	-0.07	-0.14*	-0.21***	-0.21***							
6	career orientation	3.39 (0.93)	0.35***	0.39***	0.28***	0.36***	-0.12*						
7	friendship orientation	3.40 (0.97)	0.31***	0.29***	0.30***	0.27***	-0.10	0.24***					
8	impression management	3.23 (0.83)	0.32***	0.30***	0.34***	0.32***	-0.16**	0.41***	0.37***				
9	knowing the benefits	4.17 (0.64)	0.28***	0.30***	0.21***	0.30***	-0.15*	0.31***	0.35***	0.28***			
10	anxiety unknown	2.99 (1.09)	-0.21***	-0.22***	-0.25***	-0.15**	-0.05	-0.14*	-0.26***	-0.11	-0.11		
11	diversity expertise	2.31 (1.24)	-0.14*	-0.23***	-0.27***	-0.24***	0.28***	-0.18**	-0.19**	-0.19**	-0.07	0.01	
12	diversity occupation	2.83 (1.31)	-0.25***	-0.26***	-0.32***	-0.32***	0.20***	-0.19***	-0.21***	-0.20***	-0.15*	0.09	0.47***

Table 3: Descriptive statistics and all intercorrelations of the dependent, independent, and control variables for the whole network as well as the five characteristics of the participants.
Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

support proactively added people (*M* = 3.52, *SD* = 1.38) than reactively added ones (*M* = 3.09, *SD* = 1.42). Therefore, hypothesis two is supported. The same was true for people with similar expertise compared to people with different expertise. Participants socially identified more (*M* = 3.43, *SD* = 1.04) with people with similar expertise than with people with different expertise (*M* = 2.84, *SD* = 1.13) and they were more willing to support people with similar expertise (*M* = 3.63, *SD* = 1.26) than people with different expertise (*M* = 3.03, *SD* = 1.44). Finally, participants socially identified more (*M* = 3.32, *SD* = 1.08) with others having similar occupations than with others having different occupations (*M* = 2.85, *SD* = 1.16). Also, they were more willing to support people with a similar occupation (*M* = 3.58, *SD* = 1.27) than people with a different occupation (*M* = 3.01, *SD* = 1.45). Hence, hypothesis three is supported.

	social identification		**supportive behavior**	
predictor	**B**	**SE B**	**B**	**SE B**
intercept (proactive / sim. exp. / sim. occ.)	2.94 ***	0.07	3.31 ***	0.09
I received the contact request (reactive)	-0.21 ***	0.06	-0.21 **	0.07
I do not know who sent the contact request	-0.10	0.08	-0.30 **	0.09
individuals have different expertise	-0.39 ***	0.06	-0.34 ***	0.08
I do not know the expertise of the persons	-1.01 ***	0.14	-1.06 ***	0.17
individuals have different occupations	-0.16 *	0.06	-0.34 ***	0.07
I do not know the occupations of the persons	0.35	0.23	-0.00	0.28
random effects				
σ^2	0.81		1.14	
$\tau_{00\ participant}$	0.21		0.59	
ICC	0.21		0.34	
marginal R^2 / conditional R^2	0.24 / 0.40		0.16 / 0.45	

Table 4: Linear mixed effect models. Dependent variable: social identification and willingness to support the network. Independent variables: formal features of who sent the contact request, similar vs. different expertise, similar vs. different occupation. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

To test hypotheses four A and four B we calculated two path models. We used the three social identification measures, the diversity measures, and the control measures that referred to the whole online business network. The small model (Figure 4) showed that network diversity negatively influences cognitive self-categorization which in turn positively influenced social identification which in turn positively influenced supportive behavior. In the large model (Figure 5), again cognitive self-categorization positively influenced social identification with the network which in turn positively influenced supportive behavior towards the network. Moreover, perceived entitativity of the network positively influenced cognitive self-

categorization and perceived heterogeneity of the network negatively influenced cognitive self-categorization as expected. Both network diversity concerning expertise and concerning occupation negatively influenced perceived entitativity and positively influence perceived heterogeneity. However, some paths were not significant as estimate values were very small. Altogether, the small model had a better fit than the large model.

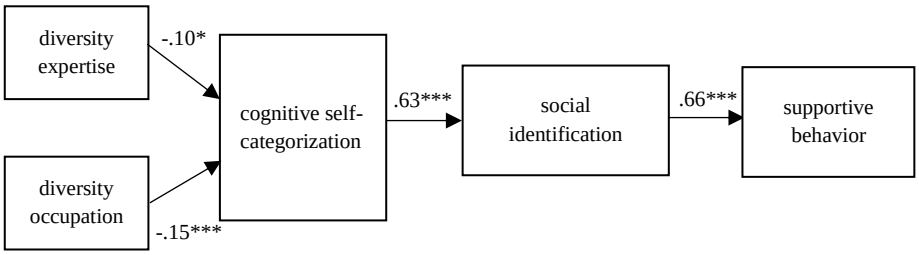


Figure 4: Results for the small path model: chi-square = 17.10, $p < .01$; $df = 5$; $N = 301$; comparative fit index (CFI) = .96; Tucker-Lewis Index (TLI) = .93; root mean square error of approximation (RMSEA) = .090. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

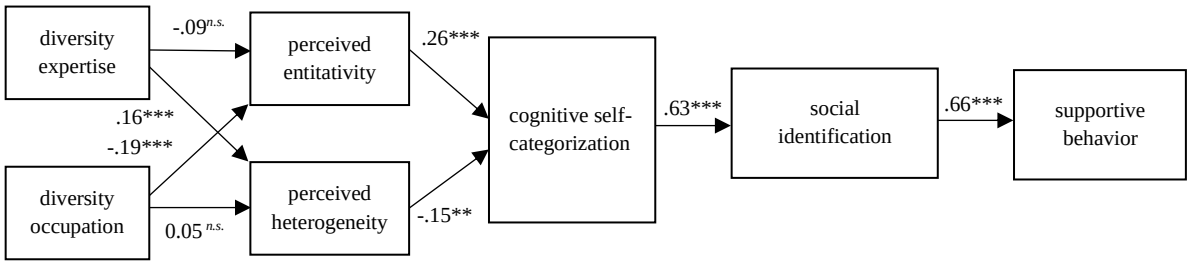


Figure 5: Results for the large path model: chi-square = 157.10, $p < .001$; $df = 11$; $N = 301$; comparative fit index (CFI) = .73; Tucker-Lewis Index (TLI) = .49; root mean square error of approximation (RMSEA) = .210. Levels of significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Finally, we tested hypothesis five. We calculated linear mixed model regression analyses to relate the five characteristics of the participant to the five characteristics assigned to the named individuals per participant. Since every participant rated the characteristics for five named individuals, ratings were nested within participants. The results can be seen in Figure 6. It shows that there were differences in the ratings between the five characteristics. Career orientation (red) as well as impression management (green) were strongly assigned to the five named individuals independent of participants' own scores. For the other three characteristics of friendship orientation (blue), knowing about the benefits of networking (yellow), and anxiety towards unknown people (orange) we can see a positive association between participants' own scores and their ratings for the five named individuals. Hence, when participants indicated

higher values for themselves, they also indicated higher values for the five named individuals. Also, there was no negative association for any of the characteristics, meaning that there was no characteristic where participants did assign lower values to the five persons when they themselves indicated higher values. In conclusion, hypothesis five is only partially supported.

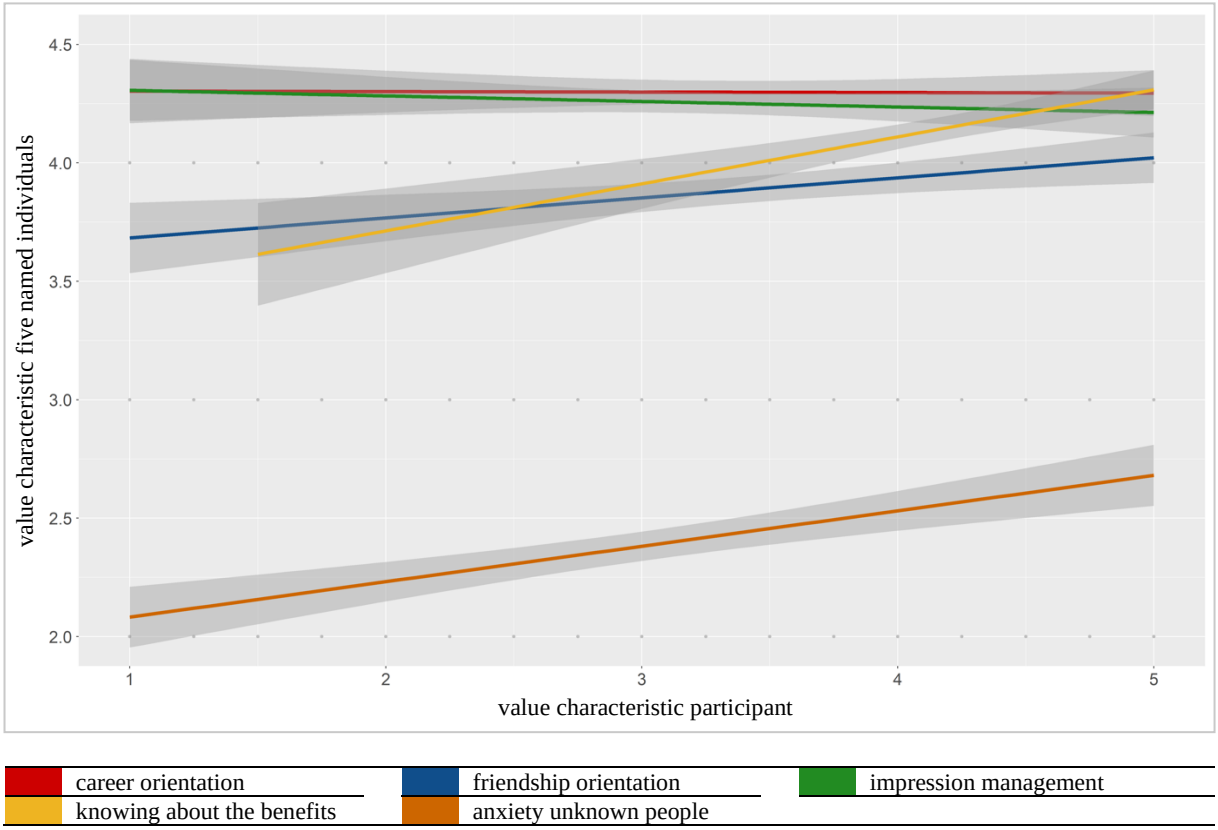


Figure 6: Individual regression slopes for career orientation with $F(1,298.50) = 0.01$, *n.s.*, marginal $R^2 = 0.00$, conditional $R^2 = 0.16$, $B = -0.00$; friendship orientation with $F(1,294.73) = 4.89$, $p < .05$, marginal $R^2 = 0.01$, conditional $R^2 = 0.19$, $B = 0.08$; impression management with $F(1,296.23) = 0.46$, *n.s.*, marginal $R^2 = 0.00$, conditional $R^2 = 0.16$, $B = -0.02$; knowing about the benefits with $F(1,294.82) = 14.94$, $p < .001$, marginal $R^2 = 0.02$, conditional $R^2 = 0.17$, $B = 0.20$; anxiety towards unknown people with $F(1,293.02) = 14.64$, $p < .001$, marginal $R^2 = 0.02$, conditional $R^2 = 0.23$, $B = 0.15$.

4.3 Discussion Survey Study

The survey study showed that people differently identify with different subsets of their online business networks. They identified more with people in the network who were added proactively by sending them a contact request than with people from whom they have accepted the contact request. The same was true for people's willingness to support people in their networks. Furthermore, both social identification and support were lower towards people with different expertise and different occupation than towards people with similar expertise and similar occupation. The assumption that network diversity concerning expertise and occupation negatively influences people's cognitive self-categorization, social identification, and support

towards the network was also supported by the path models. For both models, all directions of influence were in line with expectations. Finally, characteristics attribution revealed mixed results between the five investigated characteristics. Some characteristics were attributed dependent on participants' own values, others were not.

5. General Discussion

Taken together, the two studies revealed the following: First, a change in the design of contact recommendations and contact requests emphasizing differences in contrast to commonalities does not influence how people socially identify and support their online business networks. Second, in an experimental setting, people do not make a difference between a network assembled proactively and a network assembled reactively, either. When asked about their real online business networks, however, they indicate different levels of social identification with and different levels of willingness to support for different subsets of their networks based on who sent the contact request. They socially identified and showed more willingness to support the subgroup of people they have sent the contact requests compared to the subgroup of people from whom they have received the request. The same applied to network diversity. In the experimental study, we did not find a direct effect of network diversity on social identification and support. But when we asked people about their real online business networks, we found a difference between subsets of people in their networks based on whether they had similar or different expertise and occupation. People socially identified more with and showed more willingness to support subsets of people with similar expertise and occupation compared to subsets of people with different expertise and occupation. When calculating the path models, both studies showed that there were mediated effects of network diversity via cognitive self-categorization on social identification and support. Moreover, perceived network entitativity and heterogeneity mediated the effects of network diversity on cognitive self-categorization. However, in general, the smaller models without perceived entitativity and heterogeneity had a better model fit than the large models with these control variables. Finally, the survey study asking people about their real online business networks showed that people attribute others in their business networks with some characteristics of their own but not with all of them.

5.1 Theoretical Implications

Our studies have shown that the SIP can build the underlying groundwork for the SCT. However, when people build more diverse business networks, network diversity can compromise the idea of the SCT. The aims of researchers to encourage people to build more

diverse business networks by changing the design of contact recommendations (Baumann & Utz, 2019; 2020; Gómez-Zará et al., 2020) does not directly influence people's social identification with their assembled networks. Yet, our studies revealed that a diverse network concerning expertise and occupation does negatively influence social identification and the resulting willingness to support the network. With respect to our results, we again want to discuss the three barriers to integrating the two theories in a professional online setting. These are first, offline becomes online, second the usage of platforms for professional networking gets involved, and finally clear organizational/group structures become highly individual business networks.

Both theories have been investigated in online settings before. For one thing, research showed that online business networks also contribute to a person's social capital (e.g. Cheng et al., 2019; Domahidi, 2018; Utz & Breuer, 2016; Utz, 2016). On the other hand, the SIP has also been investigated with online communities, forums, and groups on social networking sites (Chiang, Suen & Hsiao, 2013; Chiu et al., 2015; Chung, Nam & Koo, 2016; Morin & Flynn, 2014; Qu & Lee, 2011). Nevertheless, online research concerning the SIP has always focused on groups with clear group boundaries. A requirement that online networks do not fulfill as online business networks are highly individual aggregates of people. However, research has also shown that people do not have to identify with the entire group. People can recategorize between different subsets and differently identify with different subsets of a larger group (Crisp et al., 2002; Crisp, Hewstone & Cairns, 2001; Crisp et al., 2003; Crisp, Stone & Hall, 2006). Moreover, within-group differences can foster identification when people use individual differences as a basis to identify (Homan et al., 2007; Jans, Postmes & van der Zee, 2012; Jetten et al., 2006; Jetten, Postmes & McAuliffe, 2002). Our results support those findings as we also see that people differently identify with different subsets of the network with respect to who sent the contact request, similar or different expertise, and similar or different occupation. Furthermore, people partially attribute others in their networks with characteristics of their own, making shared characteristics the basis for identification when other bases are absent.

Moreover, online social capital is interlinked and tied to the usage of professional SNS. Offline social capital only comes from groups where people meet, hang out, discuss, and organize because people must be aware of each other's existence (Putnam 1995). That is because in offline times the benefits of social capital which are access to information, influence, and solidarity could only come into existence when people engaged in interpersonal exchange. On

professional SNS, people can also engage in interpersonal exchange via direct messages or via discussions under a post. However, reading the post itself can already grant access to information. Especially for knowledge workers, access to information is a major benefit of social capital. However, the information received through a post can support someone's work without the poster even knowing it. Hence, the most important advantage of professional SNS is that people can post and thereby share information with everyone in their networks and beyond usually being unaware of who will see the information and who will benefit from it. Because there are several ways to see a post. First, all people in the online business network of the poster can see the post. However, when people of the poster's online business network like, share, or comment on the post it can become visible to their online business networks as well, increasing the range even further. Taken together, we propose the following thesis: The benefits and opportunities arising from the very specific online settings can compensate for the lack of social identification. They can compensate that people differently identify with different subsets of people in their networks. They can compensate that more diverse networks lead to a lower level of social identification with the network. They can compensate that there are no clear group boundaries and business networks are highly individual aggregations of people. And finally, they can compensate that people do not directly interact with others in their networks, a precondition that offline social capital requires.

5.2 Limitations of the Studies

There are some limitations we want to address. For the experimental study, we want to discuss issues concerning the external validity of the study. The study design and procedure contained aspects that might have led to a networking experience that differed from a real networking experience. We think participants knew the business networking site, the contact recommendations, and the sending and accepting of contact requests were fake. That is because there was no log-in necessary and participants did not leave the questionnaire to go to another website. Therefore, there were no ramifications to the professional networking part. Moreover, participants had to empathize with a scenario of holding a business degree and working in logistics. This was necessary to define the similarity of the fake profiles with the participant. Furthermore, in the first assessment, we asked people about their social identification and support towards a network that was either completely assembled proactively by sending out contact requests or reactively by accepting contact requests. Real business networks, on the other hand, contain people who have been added to the network with both types of networking. Taken together, all these elements bring people away from the feeling of real networking.

For the survey study, we want to discuss issues with the assessment of social identification and support at an individual level for the five named individuals. The SIP is a theory of intra- and intergroup relation and behavior. With the assessment of social identification and support towards the five individual people we rather assessed identification and behavior at an interpersonal level. However, we aggregated the data across all individuals that fit into the same category. Hence the data did not constitute interpersonal relationships anymore but rather the relationships with small subsets of the network or with representatives of a subset with the corresponding feature. Moreover, that is why we also included the assessment about the whole business network so see general associations that referred to the overall online business network instead to different subgroups of the network.

Finally, for both studies, we want to address issues with the assessment of perceived network heterogeneity. In both studies, the values of the Cronbach's α for the four items were weak. That was because the two items by Leach et al. (2008) did work well together while the two items by Campion, Medsker, and Higgs (1993) did not fit into the scale. When planning the study, we wanted to combine these items as these items were most adaptable to the context of professional online networking. Since the four items did not fit together, consequently, we removed the two items by Campion, Medsker, and Higgs (1993) and only used the two items by Leach et al. (2008) in both studies. Hence, the assessment was kept comparable between the two studies.

5.3 Future Research

Future research should further investigate the relationship between people and their online business networks when people network more diverse. The two studies are only a first step into investigating people's social identification with and their willingness to support diverse online business networks. Yet, many questions remain unanswered. Are there additional ways to divide online business networks into different subsets other than based on who initiated the connection, similarity in expertise, and similarity in occupation? Are there additional ways to identify with diverse online business networks other than based on characteristics attribution? Or which other characteristics are attributed and what is the difference between them? Since there is only little research on professional online networking and people's relationships with their online business networks, research in the field will become more important (Blank & Lutz, 2017). This is especially true when people do not only use professional SNS to digitally manage their offline networks but connect with people they do not know in the offline world.

In hindsight, we also want to address that we have always assumed a mediation effect between network diversity, self-categorization, social identification, and willingness to support the network. When we talked with other researchers about our study, they asked why we did not think about a moderation effect. So that people will support their diverse business networks in case they identify with them and they will not support their diverse business networks in case they do not identify with them. Hence, in future studies the relation between the variables could also be investigated as moderation effect.

6. Conclusion

We conducted two studies to investigate how people socially identify with their business networks depending on network diversity. The first one was an experimental study where participants networked with a mock-up business networking site. The second study was a survey study using an ego-centered social network analysis approach and asked for people's real business networks. We found that people differently identify with different subsets of their online business networks and that network diversity leads to lower levels of social identification with the networks resulting in a lower willingness to support the networks. Hence, diverse networking carries the potential to compromise the idea of the SCT when current research suggests that diverse networking is most beneficial. However, professional SNS offer a very specific type of online setting that can compensate for the lack of social identification.

GENERAL DISCUSSION

The dissertation was set out to investigate the technological and the human side of professional online networking on professional social networking sites (SNS) such as LinkedIn and XING to gain evidence on how to encourage professional SNS users to build more diverse business networks. The cumulative dissertation was organized in four articles addressing the following four research questions:

1. Is there a difference between offline and online professional networking in terms of intensity and in terms of influence factors?
2. How do basic technological features and functions (e.g. diverse contact recommendations) influence professional online networking?
3. How do different information designs of contact recommendations influence professional online networking?
4. How does diverse online networking influence people's social identification with their online business networks?

First, article one investigated influence factors on professional (online) networking to give insights into how to continue with subsequent studies and possible ways to change technological features and functions of professional SNS. Second, articles two and three focused on the side of the technology by investigating different technological design aspects (e.g. diverse contact recommendations, types of explanations, types of information) and their influence on professional online networking. Finally, article four returned to the side of the user by investigating people's social identification with their online business networks when people network more diverse. The four research articles with a total of six studies, combining survey and experimental studies, provide comprehensive insights into how people network with professional SNS.

In summary, the four research articles show the following results: First, while mean values of four investigated networking types (intra-organizational offline, extra-organizational offline, proactive online, and reactive online) do not differ within participants, people can be clustered into four groups of networkers which are the minimal, the mainly offline, the mainly online, and finally the heavy networkers (Article I). Moreover, people's (online) networking is mainly driven by cognitive factors, more specifically, people's knowledge about the benefits of

(diverse) networking. When people know about the benefits of networking and the benefits of diverse networking, they network more and more diverse (Articles I and II).

People's knowledge can be addressed in the design of contact recommendations by displaying an explanation why someone is recommended thereby hinting at the benefits of networking in general and at the benefits of diversity. Moreover, this can be addressed by presenting contact recommendations emphasizing dissimilarity information in contrast to similarity information. Giving explanations does not directly influence the number of people connected with or the diversity of the assembled networks. Also, people mainly choose similar business contacts over dissimilar ones concerning expertise, occupation, and common contacts. However, explanations weaken the effect of similarity on the probability to choose a business contact. Explanations especially weaken the strong effect of the number of common contacts on the probability to choose a business contact. When we look at the influence of the presented information, we see that people choose similar business contacts when similarity information is emphasized. Yet, when dissimilarity information is emphasized, people do not use the information to avoid dissimilar others but rather choose business contacts with many contacts in other business sectors and business contacts who diversify their networks concerning occupation. Again, explanations weaken the positive effect of similarity information on the probability to choose a business contact, but explanations do not weaken the effect of dissimilarity information (Article III). Besides the influence of different types of explanations and different types of information addressing the cognitive influence of knowledge, basic technological features and functions influence professional online networking. When people are presented with a more diverse set of contact recommendations to choose from, they do not network less but consequently end up with a more diverse business network. Also, when people first see contact requests from others, they subsequently send more contact requests themselves (Article II).

Furthermore, the negative affective influence of anxiety towards unknown people is different for offline than for online networking. In online settings, the negative influence is weaker than it is in offline settings (Article I). When only looking at online settings we see that higher levels of anxiety still reduce the number of people connected with but not the diversity of the resulting networks. Hence, people do not feel less anxiety when connecting with similar others than when connecting with dissimilar others. This is also supported when the influence of anxiety is ruled out. When comparing a bookmark condition where people can only bookmark potential business contacts with a connect condition where people can only send a contact request, there

is no difference neither in quantity nor in diversity of the assembled networks nor in the levels of anxiety. Hence, people do not identify beneficial business contacts when bookmarking but do not send a request because of affective reasons when the only option is to send a request. That again shows that networking is rather driven by cognitive instead of affective influence factors (Article II).

Besides the negative affective influence of anxiety, there is also a positive affective influence of the feeling of sociability on all types of networking offline and online (Article I). People experience a feeling of sociability in the act of networking since networking is a social practice. So, when we return to the user and have a closer look at people's social identification with their networks, we see that more diverse online networking leads to a reduction of social identification with people's online business networks and as a result to a reduction of the willingness to support the networks. Also, people perceive their online business networks as different subgroups of people depending on similarity in expertise, in occupation, and depending on who initiated the connection. People socially identify and show more willingness to support the subgroup of people they have sent the contact request compared to the subgroup of people from whom they have received the request. The same applies to network diversity. People identify more and show more willingness to support subsets of people with similar expertise and occupation compared to subsets of people with different expertise and occupation. However, these differences were only present in the survey study asking people about their real online business networks but not in the experimental study were people had to network with a mock-up business networking site. Also, the type of information that was presented with the contact recommendation (similarity information vs. dissimilarity information) has no effect on social identification with and willingness to support the assembled network (Article IV). On the other hand, in the absence of formal similarity concerning expertise and occupation, there is evidence that people attribute others in their online networks with characteristics (knowledge about the benefits of networking, anxiety towards unknown people, and friendship orientation at work) of their own to perceive them as similar. However, not all characteristics were attributed to the people in the network. The characteristics of career orientation and impression management were rated to be very high for everyone independent of participants' own values of these characteristics. Yet, shared characteristics can function as a reason to identify and compensate for the lack of formal similarity when business networks become more diverse (Article IV).

The dissertation gives insights into how people use and interact with professional SNS and contact recommendations. It points out possibilities of how these websites can be improved to help users reach the full potential of professional SNS and contact recommendations. Moreover, it provides insights into potential (negative) side effects of diverse professional online networking with respect to the benefits of social capital. In the following, I will outline the overall theoretical contribution and give practical implication that derive from it. Also, I will discuss strengths and limitations of my work and finally, I will give an outlook on potential future research on the topic.

Theoretical Implications

For years, professional networking has been investigated in offline contexts. Researchers have intensely looked at intra-organizational and extra-organizational networking but with a focus on offline networking (e.g. Forret & Dougherty, 2001; 2004; Michael & Yukl, 1993; Wolff & Moser, 2009; 2010). Since studies and articles on the topic of professional online networking are very sparse, researchers have virtually ignored the fact that professional SNS have become increasingly popular and a vital part of modern days professional lives (Blank & Lutz, 2017; Brandenberg, Ozimek, Bierhoff & Janker, 2018; Davis, Wolff, Forret & Sullivan, 2020). Professional SNS and contact recommendations are a convenient way to connect with other people independent of time and space. They are perfectly suited for connecting with professionals from all sorts of fields, from all organizations, and from all over the world. Hence, I was more interested in how people use different networking approaches (offline vs. online) to fulfil their networking pursuits and less interested in whether people network inside or outside their own organization. When intensities of the four investigated networking types (intra-organizational offline, extra-organizational offline, proactive online, and reactive online) were compared, we first see no difference between them implying that people use all four networking types equally. Yet, when people are clustered into different types of networkers, we see that there are differences in usage patterns for the different approaches. People can be clustered into the minimal, the heavy, the mainly offline, and the mainly online networkers. Regarding the minimal and the heavy networks, this supports the finding by Utz and Breuer (2019) who found that people who network offline are more likely to network online while people who do not network offline are less likely to network online. Those two clusters can also be considered as reference for the social enhancement hypotheses after Kraut et al. (2002). The social enhancement hypothesis states that people who have problems in forming relationships offline

will also struggle online (i.e. the minimal networkers) while people who already have relationships offline will also have relationships online (i.e. the heavy networkers).

Having said this, the four clusters of networkers draw a more comprehensive picture as they show that there are also people in between the two extremes of those who either network very little or very much. There are also people who prefer one over the other and can be categorized into the mainly offline and the mainly online networkers. Regarding influence factors these two groups are nearly the same, yet they show clearly different patterns and a clear preference for either offline or online networking. This might be the case because of the affective influence of anxiety towards unknown people. The dissertation shows that anxiety towards unknown people reduced the amount of networking, but the strength of the association is different for offline networking than it is for online networking. In line with the social compensation hypothesis of McKenna and Bargh (1999), in online settings the association is weaker than it is in offline settings. This leads to the fact that people who have difficulty in developing social contacts offline can use the internet to compensate for those limitations and form social contacts online. The dissertation therefore finds evidence for the social enhancement and the social compensation hypotheses as they apply to different types of people which has been shown by other researchers before (Zywica & Danowski, 2008).

However, while anxiety has been found to reduce networking intensity in general and differentially reduce networking intensity for offline and for online networking, it has not been found to influence with whom people connect. In online settings, higher levels of anxiety still reduce the number of people connected with but not the diversity of the resulting networks. Hence, people do not feel less anxiety when connecting with similar others than when connecting with dissimilar others and there is no difference in anxiety when people only bookmark potential business contacts than when they connect with potential business contacts. This shows that the choice with whom we connect is not driven by anxiety or affective influences but rather by a balance between the homophily principle and people's knowledge about the benefits of diverse networking. On the one hand side, the homophily principle states that "a contact between similar people occurs at a higher rate than among dissimilar people" because we tend to surround ourselves with people that are similar to us concerning "sociodemographic, behavioral, and intrapersonal characteristics" (McPherson, Smith-Lovin & Cook, 2011, p. 415f.; Ahuja, Soda & Zaheer, 2012; Ibarra 1992; Ingram & Morris, 2007). "Homophily in ethnicity creates the strongest divides in our personal environments, with age,

religion, education, occupation, and gender following in roughly that order" (McPherson, Smith-Lovin & Cook, 2001, p. 415). Homophily has been found to be a major element in relationship formation both in private settings (e.g. Greene, Derlega & Mathews, 2006; Kaptein, Castaneda, Fernandez & Nass, 2014; Knapp & Vangelisti, 2009; Regan, 2011) and in professional settings (e.g. Gómez-Zará et al. 2019; Hinds, Carley, Krackhardt & Wholey, 2000). This has been replicated in the current dissertation. When professionally networking with a mock-up business networking site, people actively look for others who are similar to them. They choose others with similar expertise, similar occupation, and high number of common contacts, common event, and common groups.

On the other hand, people's knowing about the benefits of networking and the benefits of diverse networking have been found to influence with whom people connect. The cognitive influence of people's knowledge has not been systematically studied before although there were indications that networking is driven by the fact that people know that it can be beneficial for their professional lives and careers. De Janasz and Forret (2008, p. 635) for example say that usually students who have not yet started their careers often misinterpret professional networking as "asking special favors from others to gain an unfair advantage" and therefore do not network. Also, a variety of self-help books and articles try to advise people how to business network and inform about the benefits of business networking. However, the relation of knowing about the benefits of networking and actual networking has never been investigated. The dissertation shows that knowing about the benefits of networking in general influences the intensity of networking, knowing about the benefits of diverse networking influences the diversity of the assembled business networks.

Since people's knowing about the benefits of networking is one major influence factor, the idea was to address this knowledge in the design of contact recommendations to encourage people to network more diverse (Davis & Chouinard, 2016; Withagen, de Poel, Araújo & Pepping, 2012). People's knowledge could easily be addressed by implementing explanations hinting at dissimilar others and additionally hinting at the benefits of diversity and by implementing information emphasizing dissimilarity. While explanations do not directly influence the amount of networking or the diversity of the assembled networks concerning expertise or occupation, they still weaken the homophily principle. Presenting explanations weakens the strong impact of the number of common contacts on the probability to choose a potential business contact. With respect to different types of presented information, the presentation of dissimilarity

information does not make people avoid dissimilar others as has been shown by Gómez-Zará, Guo, DeChurch, and Contractor (2020). People choose business contacts with many contacts in other business sectors and they also choose business contacts that make their networks more diverse concerning occupation. With respect to the number of contacts it seems that people rather look for large numbers than for the meaning of the numbers. People choose the business contacts with the largest number of both *common contacts* and *contacts in other business sectors*. This might simply be heuristic behavior. People are conditioned to look for large numbers when it comes to the number of contacts and rather heuristically choose the ones with the largest numbers without paying much attention to the wording. Besides, showing who else likes something is already considered an explanation namely a social explanation (Wang, Ester, Bu & Cai, 2014, p. 173; Sharma & Cosley, 2013). Furthermore, the mentioning of common contacts or contacts in other business sectors can be interpreted as how popular a person is. Also, it can be interpreted with respect to the probability of acceptance of the request. People with large networks might provide a higher probability to accept the contact request. It seems that concerning the number of contacts, be it common contacts or contacts in other business sectors, the rule is: the more, the merrier. In conclusion, knowledge about the benefits of networking and about the benefits of diverse networking can override homophily to some extent.

Finally, returning to the side of the user, the dissertation shows that there is also a major influence of the feeling of sociability on professional networking both offline and online. Networking, meaning the building and maintaining of relationships, is a social practice. Therefore, I was wondering how diverse networking would influence people's relationships with their networks. Research in the field of social capital mainly focused on the content and the structure of social networks and the resulting benefits (Adler & Kwon, 2002; Burt, 1992; 2000; Granovetter, 1973). However, the field lacks an underlying groundwork why people help and support each other. This is the reason I wanted to combine the social capital theory (SCT) with the social identity perspective (SIP) after Tajfel and Turner (1979; 1986) making the SIP the underlying groundwork for the SCT. Since right from the start, both theories share many concepts and ideas, they could easily be combined in offline settings. This approach has already been theorized in the context of organizations (Kramer, 2006a; Kramer, 2006b) coming to the conclusion "that social and contextual cues that make salient or otherwise activate individuals' collective identities enhance the propensity to engage in those forms of collectively oriented behavior directly implicated in the creation of social capital" (Kramer, 2006a, p. 8). Hence

previous articles combining the two theories have operated in an offline and organizational context which is not existent in the current dissertation. In online settings the two theories so far have only been investigated individually showing that both theories can be transferred to online settings (e.g. Chiang, Suen & Hsiao, 2013; Chung, Nam & Koo, 2016; Domahidi, 2018; Morin & Flynn, 2014; Utz & Breuer, 2016).

The current dissertation adds to previous research by showing that the SIP can also function as an underlying groundwork for the SCT in online settings. Besides, it shows that diverse professional networking can compromise the idea of the SCT since network diversity concerning expertise and occupation does negatively influence social identification and the willingness to support the network. Hence, the dissertation gives insights into potential negative side effects of diverse networking when previous research mainly focused on the benefits (e.g. Baer, 2010; Burt, 2004; Eagle, Macy & Claxton, 2010; Parise, Whelan & Todd, 2015; Perry-Smith, 2006; Sosa, 2011). Having said this, there is also evidence that people differentially identify with different subgroups within their business networks which has previously been shown in offline contexts as well (Crisp, Ensari, Hewstone & Miller, 2002; Crisp, Hewstone & Cairns, 2001; Crisp, Hewstone, Richards & Paolini, 2003; Crisp, Stone & Hall, 2006).

Moreover, it has previously been shown that within-group differences can facilitate identification when people use individual differences and the appreciation of diversity as a basis to identify (Homan, van Knippenberg, van Kleef & De Dreu, 2007; Jans, Postmes & van der Zee, 2012; Jetten, McAuliffe, Hornsey & Hogg, 2006; Jetten, Postmes & McAuliffe, 2002). The current dissertation finds evidence that in the absence of formal similarity concerning expertise and occupation, people use shared characteristics as a reason to identify. People attribute others in their networks with characteristics of their own (knowledge about the benefits of networking, anxiety towards unknown people, and friendship orientation at work). However, not all characteristics were attributed to the people in the networks. The characteristics of career orientation and impression management were rated to be very high independent of participants' own values of these characteristics. I think this is because people think of career orientation and impression management pursuits in a binary way meaning they are either present or they are not. People may assume that others who use professional SNS want to make a career and show off professional achievements while those who do not want to make a career or show off professional achievement simply do not use professional SNS. Following the logic of the third-person-effect that media effects apply to others but not to themselves, people rate everyone who

has an account to be very high at these characteristics independent of their own values. On the other hand, the characteristics of knowing about the benefits of networking, anxiety towards unknown people, and friendship orientation at work seem to be perceived in a more gradient way. As a result, people rate others in their networks dependent on their own values as they attribute others with characteristic of their own to perceive them as similar. This can compensate for the lack of formal similarity.

Finally, the benefits and opportunities arising from the very specific online settings can compensate for the lack of social identification. A lack of social identification does not necessarily compromise the SCT within online settings compared to offline settings. In online settings the benefits of the SCT do not only derive from personal interaction, they derive from the specification of professional SNS since people can share information with everyone in their networks and beyond usually being unaware of who will see the information and who will benefit from it.

In summary, when humans interact with technology, the interaction is defined by both the technological and the human side. On the one hand side, technology must offer information on how it is used. Only when people know about technological features and functions, they may use them depending on their goals and intentions (e.g. Gaver, 1991; 1992; Hutchby, 2001; Norman, 1988; Vicente & Rasmussen, 1992). Moreover, design aspect can invite or encourage people to perform a certain behavior (Davis & Chouinard, 2016; Withagen et al., 2012). The dissertation shows that there are different types of networkers driven by different influence factors defining how and how much they network. In general, people do follow the homophily principle when building professional networks online. However, the tendency to connect with similar others can be weakened with several approaches. First, recommending a more diverse set of people can encourage people to build more diverse business networks. Second, an explanation why someone is recommended hinting at the benefits of diverse networking can inform people about how technology is used best and address people’s knowledge about the benefits of (diverse) networking. Third, emphasizing dissimilarities as a reason to connect can encourage people to connect with others who have many contacts in other business sectors. Hence, contact recommendations are a feature of professional SNS that can be designed to encourage people to network more diverse. On the other hand, people must deal with the potential negative side effects of diverse professional online networking. Diverse networking can influence people’s identification with their online networks but potential negative side

effects resulting from a lack of identification and willingness to support can be compensated by other approaches for identification and by the specific features and functions of professional SNS.

Practical Implications

Based on the current dissertation I would like to give some practical implications on how professional SNS in general and recommender systems in specific can be improved. Since, people's knowledge about the benefits of networking in general and about the benefits of diverse networking in specific have been found to be a major predictor of who people connect with, people need to be informed about these benefits. The design of contact recommendations is a perfect start to encourage people to network more diverse. First, present users with a more diverse set of recommendations and simultaneously inform them about the benefits of diverse online networking with explanations or additional information. This can be achieved with an explanation why someone is recommended thereby hinting at the benefits of diverse online networking. Simply making people aware of dissimilar others does not influence people's networking behavior in the expected way. Explanations need to address people's knowledge about the benefits of diversity or maybe even create it if it does not already exist. Informing people about the benefits can also be achieved by emphasizing dissimilarity information. When contact recommendations are always presented with similarity information, people think that similarity is good. Emphasizing dissimilarity information with positive wordings such as "complementary" or "extending" hints at the fact that dissimilarity is beneficial, too. Here I propose to use similarity and dissimilarity information in combination. This way, users can get a comprehensive picture of the potential business contact regarding the things they share which can be used as a reason to identify and the things with which they complement each other building the basis for the benefits of diverse social capital. Hence, providing people with information about similarities and dissimilarities will make decisions more elaborate as people can relate the two types of information to one another.

However, all these recommendations are with respect to people who already have an account on a professional SNS. Since there is evidence that especially people with higher levels of anxiety towards unknown people can use online networking to compensate for offline restraints, people need to be motivated to use professional SNS in the first place. There are hundreds of guidebooks and articles advising people how to business network. However, online networking might be underrepresented in these books (e.g. Byham, 2009; Casciaro, Gino & Kouchaki,

2016; Cross & Thomas, 2011; Misner & Hilliard, 2017). These books and articles should explicitly advise people how to professionally network with professional SNS. Professional SNS can offer a full-fledged networking opportunity, especially for people who have problems with offline networking, since online settings can help to overcome or compensate for offline restraints. On the other hand, organizations, managers, and decision makers should acknowledge online networking as an adequate networking tool. There will always be people who do not want or who simply cannot network offline, due to anxiety, shyness, or because of a lack of experience, resources, or time. This does not mean that these people want to avoid networking altogether. Hence, online networking should not be underestimated or regarded as inferior to offline networking.

Limitations and Strengths

In this chapter I first want to discuss limitations of the dissertation but also mention some strengths. Concerning limitations there are four major points to discuss. The first limitation is with respect to external validity of the experimental studies. Even though the mock-up business networking site and the contact recommendations looked like other professional SNS, participants were certainly aware of the fact that the mock-up was in fact a mock-up. Participants did not leave the questionnaire to go to another website, there was no log-in necessary, they have never created an account, and the profile photos were blurred. This affects the external validity of the experimental studies, since there were no real ramifications to the networking. A result thereof might have been the amount of networking which was relatively high in all experimental studies when considering that people only looked at the contact recommendations once.

The second limitation is concerning the scenario of people holding a business degree and working in logistics. This was another element that brough people further away from a real networking experience. The scenario was necessary to define basic similarity and dissimilarity concerning expertise and occupation between the fake profiles and the participants. At the end of the questionnaire people were asked how much they emphasized with the scenario and if they had the scenario in mind while they were networking. Holding a business degree and working in logistics might have been hard to imagine for some participants. Hence, people who scored below the center of the scale were excluded from data analysis. Also, maybe participants would have networked differently if they had networked for themselves. It would have been possible to ask participants about their real expertise and occupation and calculate the basic

similarity score concerning expertise and occupation for every participant individually. However, this would have made it impossible to assemble similar and dissimilar sets of recommendations in a controlled manner as it was used in article two. Also, in articles three and four the sets of recommendations were assembled with a tendency towards dissimilar others so the recommendations would fit the explanations hinting at dissimilar others. It would not have been possible to control whether the presented fake profiles and explanations indeed presented dissimilar others if people have had networked for themselves.

The third limitation is with respect to internal validity of the experimental studies. Especially in the second study of article three, we see that participants choose recommended business contacts with many contacts in other business sectors. There are several explanations possible, yet this might also be the case because people were not paying attention to the wording and thought they were choosing business contacts with many contacts in common. Since there was no manipulation check to control whether people read all the details of the contact recommendations and the contact requests, unfortunately there is no way to assure that participants did. Unfortunately, the same is true for the explanations. We did not assess whether people read all the explanations that were presented.

Finally, the fourth limitation is with respect to combining the SCT with the SIP. Right from the start, the attempt to combine the two theories was very ambitious. Investigating social identification with a recently assembled group of fake people with no information but their names, expertise and occupations, and with blurry profile pictures is of course highly criticizable. Yet, in the overall attempt to encourage professional SNS users to network more diverse there is a chance that this becomes reality. When people connect with business contacts from all sorts of fields and from all over the world, who they have never met before and might not be able to meet in person, the only available information is the profile information. Hence, the experimental set-up might not be as far from reality as it appears. For that reason, the investigation of people's social identification with and their willingness to support their networks is highly relevant.

Concerning strengths, I first would like to mention the samples of the six studies. All samples were recruited via Prolific with filters for native language, age, and professional SNS use. As a result, the samples mainly consisted of working people from the UK and the US, with mean ages between 33 and 37 years. Gender was almost always balanced between male and female

participants. Admittedly, all samples were convenient samples falling into the WEIRD (western, educated, industrialized, rich, democratic) category. The samples are far from being representative of the WEIRD population and even farther from making a prediction for people from non-WEIRD nations. Yet, the samples are also far from being young undergraduate student samples which have been used in psychological and communication research to a great extent for decades (Basil, 1996; Hanel & Vione, 2016; Meltzer, Naab & Daschmann, 2012; Potter, Cooper & Dupagne, 1993; Rad, Martingano & Ginges, 2018).

The second strength is measurement consistency throughout the dissertation. All experimental studies used the same mock-up business networking site, which only differed with respect to the experimental conditions, and the same 164 self-created fake business contacts (also called profiles). These profiles were assembled in different sets and the numbers of the similarity/dissimilarity metrics were adapted to the context. However, the profiles' names and their basic similarity with respect to expertise and occupation have always been the same. Moreover, all experimental studies used the same cover story of investigating modern working life and the same questions and tasks to distract participants from the real research intention. In a pretest of the research environment, the cover story has not been used. Since the amount of networking was very high in the pretest, participants presumably anticipated the research intention. In case there have been influences for example because of priming or framing effects based on the distracting questions, the influence has always been the same for all experimental studies. Lastly, in all studies both experimental and non-experimental the same scales were used for the same concepts. There were only minor adaptations of the wordings with respect to the studies' contexts and minor changes in scale length between studies to keep scale length comparable within studies.

Finally, the third strength is about the combination of experimental and non-experimental studies. The current dissertation combined self-report based survey studies and controlled experimental studies to investigate the topic from different perspectives and to combine the resulting insights. Survey studies were used to ask people about their real networking behavior and their real online business networks while experimental studies were used to assess networking behavior under different technological design options in a controlled set-up. Survey studies could compensate for limitations concerning the experimental designs with respect to external validity and the used scenario, while experimental studies could compensate for self-report biases.

Future Research

Future research should broaden the findings of the current dissertation concerning the technological and the human side of professional online networking and concerning methodological approaches. Since there are only few studies investigating professional networking with professional SNS, there are many things that can be looked at in more detail (Blank & Lutz, 2017). First, on the technological side with a direct alignment to the current dissertation, additional design aspects need to be investigated. Providing an explanation and providing different sorts of information was just the beginning. I mainly looked at the basic use of explanations and different types of information but not at the very details of different types of explanations and information. There are several other ways possible. For example, the design of the explanations can be changed in numerous ways with respect to what they explain, how they organize recommendations, or what wordings they use. The same is true for the presented information. Here, for example similarity and dissimilarity information could be combined to give professional SNS users a more comprehensive view about the potential business contacts.

Second, on the human side, additional influence factors on professional online networking need to be examined. The current dissertation started with investigating ten influence factors and based on the results tried to address users' needs and motivations with the design of contact recommendation. However, these investigated influence factors were rather at a general level of cognitive, affective, and motivational influences within the participant. At a situational level, when people use the website and contact recommendations, there might be other influences that come into effect. These influences might be related to people's stance on technology in general such as their willingness to accept and use new technologies (Van der Heijden, 2004; Wu & Wang, 2005), their stance on online privacy (Buchanan, Paine, Joinson & Reips, 2007; Preibusch, 2013), or their trust of the technological features and functions such as the recommender system algorithm (Guo, Zhang, Thalmann, Basu & Yorke-Smith, 2014). Additional influence factors need to be identified so they can be addressed in the design of the recommendations to accommodate and meet users' needs. Besides, the aim of the current dissertation was to change users' behavior by encouraging them to network more diverse. Therefore, the studies investigated objective behavioral measures of networking between the different conditions by looking at who people connected with. However, subjective measures such as perceived usability (Borsci, Federici & Lauriola, 2009; Lewis, 2018), user satisfaction (Ong & Lai, 2007), or serendipity meaning the ability of technology to surprise and evoke curiosity (McCay-Peet & Toms, 2011) can also be investigated. Subjective measure might not

directly influence people's networking behavior but when people like the website and the recommender system, there is a chance that they use it more often which in turn influences their networking behavior.

With respect to people's social identification with their networks, I proposed that the features and functions of the website like information sharing with the network and beyond can compensate for a potential lack of identification. However, this needs to be looked at more closely. Sometimes settings allow to filter audiences so information will only be shared with a subset of the network. Also, the current dissertation only gave a very limited insight on how people attribute others in their networks with characteristics of their own. Future research might investigate what factors influence which characteristics are attributed to others and which are not. The dissertation only investigated five characteristics. Maybe there are other characteristics which are attributed to other people in the network such as personality traits or personal needs (i.e. need for power, need for achievement, and need for affiliation after Wolff, Weikamp & Batinic, 2018).

Third concerning methodology, future research should include studies in real life professional SNS settings. The idea of this dissertation was to test options before investing time and resources into programming. It gives first insights and lays the ground for future research of this kind. Since a great limitation of the experimental design was that people presumably knew that the business networking site was not real, investigations in real life settings with real life user data will give further insights. This requires the programming of a new contact recommender system or at least the implementation of explanations and different types of information into currently used contact recommendations. In cooperation with professional SNS such as LinkedIn or XING real user data could be analyzed when different types of recommendations, explanations, and information are implemented into a real business networking site. This could either be achieved by analyzing the website's log data or with experience samplings, meaning that when people sent or accept a contact request on the platform a little questionnaire pops up asking questions about their networking experience right after the moment of networking.

Moreover, future research could use other types of methodology. As already mentioned, log data and experience samplings are ways to assess user behavior in the moment of real online networking. They offer the opportunity to investigate professional online networking in a

longitudinal study design. In the current dissertation, people saw the networking situation of sending and accepting contact requests once. People in the experimental conditions with an explanation or information emphasizing dissimilarity saw this type of recommendation for the very first time since other business networking sites still use the well-known recommendation systems based on similarity. It would be interesting to see how networking behavior will change over time when people see explanations hinting at the benefits of diversity as well as dissimilarity information repeatedly. Over time they might integrate these advises into their knowledge and make use of it even more.

Finally, I want to ask the following question: Where is the limit of diversity? So far, all research concerning the benefits of diversity focus on the association between diversity measures (such as network structure, network content, or diversity indices) and indicators of success (such as creativity ratings, innovation ratings, or socio-economic data) (e.g. Baer, 2010; Burt, 2004; Eagle, Macy & Claxton, 2010; Parise, Whelan & Todd, 2015; Perry-Smith, 2006; Sosa, 2011). The dissertation therefore was set out to encourage people to build more diverse business networks. Yet, it gives insights into how diverse networking could compromise the benefits of social capital because of a lack of social identification and a resulting lack of willingness to support the network. Moreover, there are no considerations or discussions as to when diversity is too much. In other words, there is no research on when the individual differences between the people in the network to the user are too large to be able to provide meaningful perspectives, information, and ideas. For example, as a communications researcher in the field of human-computer-interaction, a diverse network of people coming from the neighboring fields of psychology, sociology, computer science, and data science is most likely to bring valuable new perspectives. In contrast, a diverse network of people coming from the fields of agricultural science, nutrition science, and veterinary medicine might be not. This of course highly depends on the individuals and their ability to use all sorts of information as inspiration for their own working tasks. Nevertheless, a discussion about where the limit of diversity or where the turning point from beneficial to non-beneficial diversity lies, is of great importance. Because when professional SNS want to implement new recommender systems that recommend a more diverse set of people, they are forced to define a threshold that ultimately determines who is recommended and who is not. Hence, future research should more closely look at potential negative side effects of diversity to be able to identify a limit based on scientific evidence.

Conclusion

Professional SNS have become increasingly popular and are a crucial element of modern days professional lives. Yet, there are very few studies investigating professional online networking with professional SNS. The dissertation gives insights into how people use and interact with professional SNS and contact recommendations. It points out possibilities of how these websites can be improved to help users reach the full potential that these platforms offer when it comes to connecting with people from all sorts of fields, from all over the world, independent of time and space. Professional SNS and online networking are especially suited for people who have difficulties with offline networking because of affective influences such as anxiety. Moreover, derived from the predominantly cognitive influence of people's knowledge about the benefits of networking and the benefits of diversity on professional online networking, technological features and functions can be designed to encourage people to network more diverse. More diverse networking, however, leads to a reduction of social identification with and willingness to support the network compromising the idea of social capital. Nevertheless, there is evidence that people find other ways to identify with their online business networks and the specific features and functions of professional SNS besides contact recommendations can compensate for the lack of identification as well.

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APPENDIX

Measurements Article I

Dependent Variables

Intra-organizational offline networking

(1) In my company, I approach employees I know by sight and start a conversation.
(2) I use company events to make new contacts.
(3) If I want to meet a person who could be of professional importance to me, I take the initiative and introduce myself.

Extra-organizational offline networking

(1) I develop informal contacts with professionals outside the organization, in order to have personal links beyond the company.
(2) I use business trips or training programs to build new contacts.
(3) When I meet a person from another organization who could be an important business contact for me, I compare notes with him/her about our common work areas.

Proactive online networking: The crossed-out items have been removed from the scale due to the results of the exploratory and confirmatory factor analyses.

(1) Getting contact recommendations makes networking easier and saves me time.
~~(2) Networking without contact recommendations is too much of an effort.~~
(3) I like contact recommendations as they inspire me to contact new people.
(4) I do not care about contact recommendations at all. (reverse)
(5) I connected to people through contact recommendations who I would not have connected to otherwise.
(6) Acting on contact recommendations provides me with more confidence to connect with people I know less.
~~(7) I generally want to know someone at least by interaction before making a connection. (reverse)~~
(8) I like to browse through contact recommendations to see who is getting recommended.
(9) I like to act on contact recommendations and send a contact request to the person recommended.

Reactive online networking: The crossed-out items have been removed from the scale due to the results of the exploratory and confirmatory factor analyses.

(1) To receive contact requests from other people saves me time with my own networking.
~~(2) Receiving contact requests is easier than sending out own requests.~~
(3) I like receiving contact requests as they lead to connections with new people.
(4) I connected to people that contacted me who I would not have connected to otherwise.
(5) Usually I accept contact requests no matter if I already know the person.
(6) I don’t mind to receive contact requests from people I have not met before in person.
~~(7) I like to browse through contact request to see who wants to be connected with me.~~
(8) I decline contact requests more often than I accept them. (reverse)

Independent Variables

Career orientation

(1) I plan my professional future long-term in advance.
(2) My current job is only a spring board for my professional advancement.
(3) I especially like tasks where I can prove my professional skills.
(4) I have a concrete vision of which position I will have reached in five years.
(5) Even when completing current tasks, I always have my career advancement in mind.
(6) I do not have any interest in pursuing a career. (reverse)

Friendship orientation

(1) I like to spend time with coworkers.
(2) I like to be friends with coworkers.
(3) It is more fun to be at work with people I am friends with.
(4) I generally like to be among people.
(5) It is important for me to hang out with friends regularly.
(6) It is important for me to have many social contacts.

Knowing about the benefits of networking

(1) A network of people of different expertise and background can give access to information that is needed to carry out own tasks.
(2) A business network can give information about innovations in the own work environment.
(3) A network of people can help to get new career opportunities.
(4) A network of people with different expertise and background can be essential to personal career success.
(5) A business network can have skills and knowledge that can help with personal work.
(6) Connecting with people now can help with personal business advancement in the future.
(7) It is important to know who knows what and to get hold of the person in a personal network.
(8) A short conversation with a person of your network can sometimes replace learning something from scratch.

Impression Management

(1) I always talk proudly about my profession, experience, or education.
(2) I try to make people aware of my talents and qualifications.
(3) I let people know of my accomplishments.
(4) I stay at work late so people will know I am hard-working.
(5) I try to appear busy, even at times when things are slower.
(6) I arrive at work early to look dedicated.

Entitlement

(1) I feel I deserve more benefits at work than others.
(2) Great success should come to me.
(3) I demand the best because I am worth it.

(4) I do not deserve special treatment at work. (reverse)
(5) I deserve more things in my professional life than my coworkers do.
(6) People like me deserve an extra break now and then.
(7) I feel entitled to more of everything such as salary increases or promotions.

Anxiety towards unknown people

(1) I get nervous if I have to speak with someone I do not know.
(2) I find it difficult to mix comfortably with new people I work with.
(3) I am at ease meeting new people at business events. (reverse)
(4) I have difficulty talking with other people I have not met before.
(5) I find it difficult to disagree with another person's point of view if it is the first encounter with this person.
(6) I am nervous mixing with people I don't know well.
(7) I am tense mixing in a group with a lot of unknown people.

Anxiety towards high-status people

(1) I get nervous if I have to speak with someone in authority like my boss.
(2) I find it difficult to mix comfortably with the people I work with.
(3) I am at ease meeting people at business events even if they are higher in hierarchy. (reverse)
(4) I have difficulty talking with people higher in hierarchy.
(5) I find it difficult to disagree with another's point of view if that person is in authority.
(6) I am tense mixing in a group with people higher in hierarchy.

Networking comfort

(1) I am comfortable asking my colleagues for advice when I need help.
(2) I don't like to bother people about my work problems because I know they are busy themselves.
(3) I am comfortable asking previous coworkers or acquaintances for their assistance in my current job.
(4) I am embarrassed about having a problem and don't like to talk about it with coworkers.
(5) I do not like to call friends of friends about possible solutions to my problem.

Feeling of dirtiness: When I engage in networking, I feel …

(1) dirty	(2) ashamed	(3) cold
(4) inauthentic	(5) uncomfortable	(6) immoral

Feeling of sociability: When I engage in networking, I feel …

(1) fine	(2) good	(3) comfortable
(4) open-minded	(5) sociable	(6) outgoing

Control Variables

Knowledge Worker

(1) I usually have to deal with new tasks where I cannot use my previous knowledge.
(2) In order to carry out my tasks I spend a lot of time communicating and cooperating with others.

(3) I always have to extend, adjust and revise my knowledge.
(4) When carrying out my tasks oftentimes unplanned and unexpected situations occur.

Hierarchy level

(1) no (2) yes, for 1-5 people (3) yes, for 6-10 people
(4) yes, for 11-20 people (5) yes, for 21-50 people (6) yes, for more than 50 people

Measurements Article II

Independent Variables

Knowing about the benefits of professional networking in general

(1) A business network can give information about innovations in the own work environment.
(2) A network of people can help to get new career opportunities.
(3) A business network can have skills and knowledge that can help with personal work.
(4) Connecting with people now can help with personal business advancement in the future.
(5) It is important to know a person's skills and to get hold of the person in a personal network.
(6) A short conversation with a person of your network can sometimes replace learning something from scratch.

Knowing about the benefits of diverse professional networking in specific: Crossed-out items have been removed from the scale due to poor reliability.

(1) Networking people with different backgrounds is better than networking people with the same background as oneself.
~~(2) A network where everyone knows everyone else is better than a network where not everyone knows everyone else. (reverse)~~
(3) A good business network is when everyone has the same expertise. (reverse)
~~(4) A network where not everyone is interconnected is better than a network where everyone is interconnected.~~
(5) A good business network is when the people in the network have different expertise and backgrounds.
~~(6) A business network can give information about innovations in the own work environment.~~

Anxiety towards unknown people

(1) I get nervous if I have to get in contact with someone I do not know.
(2) I find it difficult to mix comfortably with new people.
(3) I am at ease getting in contact with new people on business networking sites. (reverse)
(4) I find it difficult sending out/accepting contact requests to/from people I have not met before.
(5) I was completely relaxed when I was sending out/accepting contact requests. (reverse)
(6) I am tense mixing in a group with many unknown people.

Measurements Article IV

Experimental Study

Dependent Variables

Willingness to support

(1) I will share useful information (e.g. job offers) with the business network I assembled.
(2) I will provide useful knowledge and skills for the business network I assembled.
(3) I will eagerly reply to postings by help-seekers of the business network I assembled.
(4) In general, I will share my knowledge with the business network I assembled.

Social Identification

(1) I find it easy to form a bond with the business network I assembled.
(2) I identify with the business network I assembled.
(3) I feel a sense of community with the business network I assembled.
(4) I have a feeling of camaraderie with the business network I assembled.

Self-Categorization

(1) I am like other members of the business network I assembled.
(2) The business network I assembled is a reflection of who I am.
(3) I see myself as quite different from other members of the business network I assembled. (reverse)
(4) I see myself as quite similar to other members of this business network I assembled.

Control Variables

Perceived Entitativity

(1) The business network I assembled can be considered as an entity.
(2) The business network I assembled is a unit.
(3) The business network I assembled is a distinctive group.
(4) The business network I assembled feels like a group to me.

Perceived Heterogeneity: Crossed-out items have been removed from the scale due to poor reliability.

~~(1) The people in the business network I assembled have a variety of different expertises and backgrounds.~~
~~(2) The people in the business network I assembled have skills and abilities that complement each other.~~
(3) The people in the business network I assembled have a lot in common with each other. (reverse)
(4) The people in the business network I assembled are very similar to each other. (reverse)

Survey Study

Name generators

(1) Name at least one person you sent the contact request to.
(2) Name at least one person from whom you have accepted the contact request.
(3) Name at least one person you only know online and have not met offline before.
(4) Name at least one person with a different expertise (i.e. study course) than you.
(5) Name at least one person with a different occupation than you.

Dependent Variables

Willingness to support

(1) I will share useful information (e.g. job offers) with my online business network on LinkedIn.
(2) I will provide useful knowledge and skills for my online business network on LinkedIn.
(3) I will eagerly reply to postings by help-seekers of my online business network on LinkedIn.
(4) In general, I will share my knowledge with my online business network on LinkedIn.

Social Identification

(1) I find it easy to form a bond with my online business network on LinkedIn.
(2) I identify with my online business network on LinkedIn.
(3) I feel a sense of community with my online business network on LinkedIn.
(4) I have a feeling of camaraderie with my online business network on LinkedIn.

Self-Categorization

(1) I am like other members of my online business network on LinkedIn.
(2) My online business network on LinkedIn is a reflection of who I am.
(3) I see myself as quite different from other members of my online business network on LinkedIn. (reverse)
(4) I see myself as quite similar to other members of my online business network on LinkedIn.

One item willingness to support measure with five persons individually

(1) How likely would you share professional information (e.g. job offers, tips, expertise) with each of these people?

One item social identification measure with five persons individually

(1) How much do you identify with each of these people?

One item characteristics measures for the five characteristics of the five persons individually

(1) How much do you think [person] wants to make a career?
(2) How much do you think [person] wants to make friends and acquaintances?
(3) How much do you think [person] wants to make a good impression?
(4) How much do you think [person] knows about the benefits of networking?
(5) How much do you think [person] feels anxious towards unknown people?

Independent Variables

One item network diversity measure concerning expertise

(1) How many people of your online business network on LinkedIn have the same expertise (i.e. study course) like you? (reverse)

One item network diversity measure concerning occupation

(1) How many people of your online business network on LinkedIn have the same occupation like you? (reverse)

Formal features of the name generators for the five persons individually

(1) Who initiated the connection between you and the other person online (i.e. who sent the contact request)?
(2) Who of these people do you also know offline?
(3) Who of these people have a similar expertise/educational background (i.e. study course) to you?
(4) Who of these people have a similar occupation (i.e. similar business sector or similar division) to you?

Participant's career orientation:

(1) I plan my professional future in advance.
(2) My current job is only a springboard for my professional advancement.
(3) I have a concrete vision of which position I will have reached in some years.
(4) Even when completing current tasks, I always have my career advancement in mind.

Participant's friendship orientation

(1) I generally like to be among people.
(2) It is important for me to have many friends and acquaintances.
(3) It is important for me to spend time with other people regularly.
(4) I like to have many social contacts.

Participant's impression management

(1) I always talk proudly about my profession, experience, or education.
(2) I try to make people aware of my talents and qualifications.
(3) I let people know of my accomplishments.
(4) I try to appear busy, even at times when things are slower.

Participant's knowing about the benefits of networking

(1) Connecting to people now can help with personal business advancement in the future.
(2) A network of people can help to get new career opportunities.
(3) It is important to know who knows what and to get hold of the person in a personal network.
(4) A business network can have skills and knowledge that can help with personal work.

Participant's anxiety towards unknown people

(1) I have difficulty talking with other people I have not met before.
(2) I get nervous if I have to speak with someone I do not know.
(3) I find it difficult to disagree with another person's point of view if it is the first encounter with this person.
(4) I am nervous mixing with people I don't know well.

Control Variables

Perceived Entitativity

(1) My online business network on LinkedIn can be considered as an entity.
(2) My online business network on LinkedIn is a unit.
(3) My online business network on LinkedIn is a distinctive group.

(4) My online business network on LinkedIn feels like a group to me.

Perceived Heterogeneity: Crossed-out items have been removed from the scale due to poor reliability.

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(3) The people in my online business network on LinkedIn have a lot in common with each other. (reverse)

(4) The people in my online business network on LinkedIn are very similar to each other. (reverse)