



Personal networks in Saudi Arabia: The role of ascribed and achieved characteristics



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ABSTRACT

This study examines how ascribed characteristics (gender and nationality) and achieved characteristics (SES) are related to the extensity and occupational resources of personal networks in Saudi Arabia. Using large-scale survey data from Jeddah, results show that networks of women are smaller and less occupational resourceful, due to fewer non-family connections. Non-Saudi have more non-family ties and resources, but less resourceful family members. Higher SES individuals have larger and more resourceful personal networks. The study suggests that achieved status is more important in getting access to a wider variety of social ties and a more resourceful network than ascribed categories.

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1. Introduction

The literature on the consequences of personal networks for various domains in life is rapidly growing. Studies have shown that people find jobs through their networks and that information obtained via personal ties reduces search costs (Granovetter, 1973, 1974; Lin, 1999). Social networks also affect social support, happiness (Kroll, 2011), health outcomes (Smith and Christakis, 2008), trust and collective action (Putnam, 2000) and educational attainment (Coleman, 1988). The literature on social networks consists of a wide range of questions, concepts, theories and approaches about how connections and the information, support, and influence they bring with them, affect people's life chances (Burt, 2005; Coleman, 1988; Lin, 2001; Lin and Erickson, 2008; Putnam, 2000; Van der Gaag, 2005).

Precisely because personal networks have such important consequences, the study of individual differences in networks has been high on the agenda as well. One area of research has focused on the size, or extensity, of personal networks. In his research on trends in personal networks in the U.S., Putnam (2000) provided evidence to suggest that in the past decades informal connections among American citizens tend to decrease, as well as levels of civic engagement. This 'bowling alone' hypothesis has been a topic of debate in

subsequent studies, with some research being in line with the thesis and showing an increase in social isolation (McPherson et al., 2006, 2009), while other studies showing counterevidence for this thesis (Fischer, 2009; Paik and Sanchagrin, 2013; Wang and Wellman, 2010). Importantly, it has been found that there are strong individual differences in the size of personal networks, with some people having very small networks and others having very many connections (DiPrete et al., 2011).

Another line of research focuses not so much on the extensity of the network, but rather on the socio-economic resources that are embedded in the networks. Specifically, this research area studies individual differences in the 'occupational resources' that can be accessed in personal networks (Lin, 2000; McDonald, 2011). Why are some people befriended with a lawyer and professor, whereas others are not? Findings show that there are strong individual differences in how many people are known within the personal network who hold such high-status positions, as well as with informal connections to people with other occupations, such as carpenters (Behtoui, 2007; Cross and Lin, 2008; Lai, 2008; Li et al., 2008; Lin, 2000; Lin and Dumin, 1986; Lin et al., 2009). When people know more high-status people in their network, or when they know a more diverse set of occupations, they are said to have more economically resourceful networks (Van der Gaag, 2005; Van der Gaag and Snijders, 2005; Van der Gaag et al., 2008).

The aim of the current study is to contribute to the literature on individual differences in the *extensity* of personal networks and the *occupational resources* embedded in those networks. We elaborate on work that has studied correlates with these network

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dimensions, such as race/ethnicity, gender, education, and marital status (Behtoui, 2007; Erickson, 2004; Lin, 2001; Van Tubergen and Volker, 2015). Findings on these correlates have been rather inconsistent, however. A case in point is gender. In their study of 557 respondents aged 21–64 years old and living in the United States, Cross and Lin (2008) found no inequalities between men and women in occupational network resources. Li et al. (2008), who examined 1559 respondents in the United Kingdom, could not find gender differences in network resources either. Also Behtoui (2007, 2008), using data on 2349 employed people residing in Malmö, Sweden, found no gender differences. On the other hand, however, a survey conducted in 1999 in Holland among 1007 respondents showed that access to resourceful networks was higher among males (Volker et al., 2008). Thus, although most studies do not find gender differences in occupational network resources, some studies do. The puzzling, inconclusive, pattern of gender differences is illustrative of findings on access to occupational network resources.

We elaborate on existing literature in two ways. First, earlier work mostly studied either the size of the *overall* network (McCarty et al., 2001) or examined only a specific *part* of the personal network, such as the core discussion network (Burt, 2005; McPherson et al., 2006; Fischer, 2009). We differentiate between the extensity of *various networks*, i.e. connections to family and non-family (friends, acquaintances, and work/school ties). We make theoretical progress, by developing hypotheses on differential effects, which could advance our understanding of inconclusive patterns found in earlier work that studied the overall network.

Second, with respect to the occupational resources in the network, empirical work has often relied on the position generator question ‘do you know someone with occupation X’ (Lin, 2001; Lin and Erickson, 2008), without differentiating by the *source* of the occupational ties. Here, we again study differences across family and non-family ties and formulate hypotheses on these differentials. By doing so, we aim to get a better understanding of why some studies find differentiation across social categories (e.g., gender, nationality, ethnicity, SES), whereas others do not. The central argument proposed in this study is that access to network resources is dependent on which specific type of the personal network is studied (i.e., family, friends, and acquaintances).

The context of this study is Saudi Arabia, a country without a strong tradition of survey research. The data from our study come from a unique, large-scale, survey conducted in 2014 among parents in Jeddah, which is the second largest city in the Kingdom. Despite not a nationally representative survey, it is the first to study personal networks in this country and thereby contributes to our cross-cultural understanding of the extensity and resources embedded in social networks.

Within this context, we study the role of gender and nationality and compare their influence to socio-economic characteristics, i.e. education, employment and income. We take into account these ascribed and achieved characteristics, as two different dimensions that determine individual differences in the size and resources of networks (Cf. Chua, 2013; McDonald, 2011). Within the context of Saudi Arabia, the study of gender and nationality vis-à-vis the achieved characteristics of education and employment is particularly interesting. The Kingdom is known for its traditional values, gender separation in public settings, and occupational limitations for women (Al-Rasheed, 2013; House, 2012; Kucinskas, 2010). What are the consequences thereof for the relationship between gender and personal networks?

Saudi Arabia also has many foreign workers, and nationality might be an important boundary maker for personal networks as well. We also study the role of socio-economic status, as it is often considered as a way toward gaining access to high-status networks (Lin, 2001). We therefore study the role of gender, nationality and socio-economic status simultaneously (Cf. Chua, 2013), which

allows us to study the importance of ascribed vis-à-vis achieved characteristics. The research question we aim to answer is: To what extent are ascribed characteristics (gender and nationality) and achieved characteristics (socio-economic status) associated with the extensity and resources of the personal networks of parents in Jeddah, Saudi Arabia?

2. Theory and hypotheses

We develop hypotheses on the relationship between gender, nationality and socio-economic resources on the one hand, and the extensity and occupational resources of personal networks on the other. The theoretical model that relates these ‘social categories’ and network outcomes is presented in Fig. 1. We rely on general tie-generating mechanisms that have been proposed and tested in the literature on adolescent friendship networks (Wimmer and Lewis, 2010), marriage (Kalmijn, 1998) and individual differences in personal network resources (Van Tubergen and Volker, 2015).

First, scholars have emphasized that meeting *opportunities* shape people’s personal network (Blau et al., 1982). The settings in which people participate (e.g., work, neighborhood) constrain the available pool of people with whom one can interact. This can set limits to the number of people with whom one can interact and thus potentially shape the size of personal networks. In addition, such settings are often unequally distributed across social categories (e.g., ethnicity, gender) and consequently determine the composition of personal networks (Chua, 2013).

Secondly, within the available pool of contacts, it is argued that people have a preference for interacting with others who are similar to themselves (Byrne, 1971). This *homophily* mechanism is argued to happen both along cultural dimensions (e.g., lifestyle, religion, norms, values) and socioeconomic characteristics (e.g., education, income). Thus, network-formation is driven by dyadic similarity, *ceteris paribus* resulting in homogenous personal networks.

Thirdly, various *third parties*, such as family members, peers and communities, often impose social norms about social interactions with members of other groups and possibly sanction norm-deviant behavior (McPherson et al., 2001). Such third parties, also called gatekeepers (Chua, 2013), can also prohibit or interfere with participation in certain settings, institutions and organizations, thus affecting people’s opportunity space. Chua (2013: p. 1237) argued that “the link that binds ascriptive categorizations and inequalities in social capital as largely institutional”. Thus, because of unequal access to organizations and other institutions, ethnicity and gender are thought to be related to inequalities in social capital.

We use these three general tie-generating mechanisms (i.e., opportunities, preferences and third party control) to derive and develop our hypotheses on the size and resources of personal networks. In doing so, we differentiate between the number and resources of family and non-family ties, as this difference is argued to be of key importance.

2.1. Gender

We expect to see gender differences in both the extensity and occupational resources of personal networks. Saudi Arabia is a more-traditional, male-dominant, patriarchal society, with high levels of gender inequality (Al-Rasheed, 2013; House, 2012; Kucinskas, 2010). Many women stay at home, do household work and predominantly interact within the family setting. Opportunities for participating in public settings (e.g., work, school) can be hampered for women due to third party control. For example, with few exceptions, sports are not allowed for women. Men engage in family matters, but they also have more responsibilities and activities outside the family setting, i.e. they are expected to do paid

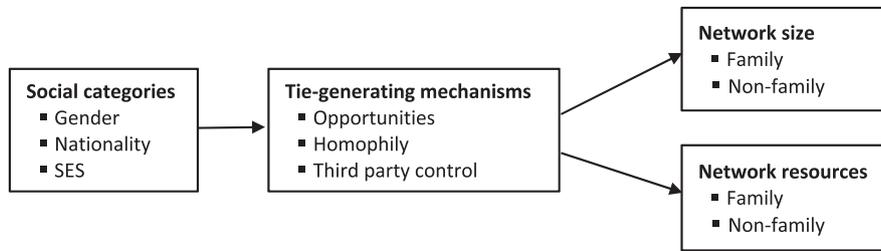


Fig. 1. Theoretical model of the relationship between social categories and network size and resources.

work, bring children to school, and assist family members to medical visits. Men can do sports, participate in public settings and thus acquire a larger network of friends and acquaintances than women. We therefore expect to see that

- the personal networks of women are smaller than those of men in Saudi Arabia (H1a);
- this gender difference in network size is only observed outside the family domain (such as with friends and acquaintances), while within the family circle, we do not expect gender differences in network size (H1b).

We develop hypotheses with respect to gender differences in occupational network resources as well. Again, we do not expect to see such differences to arise in the family sphere, where both men and women can get to know personally lawyers and doctors, for example, via family members and relatives. Gender differences are expected to occur, however, outside the family domain, because of two conditions.

First, in public settings the social contacts and interactions between men and women are highly segregated in Saudi Arabia. Gender segregation of friendship networks is presumably not typical for Saudi Arabia, as it has been observed in many (western) countries as well, and often seen as a result of gender homophily and gender-specific interests (McDonald, 2011; McPherson et al., 2001). In Saudi Arabia, however, such gender segregation in friendship networks is much higher, however, due to third party control and normative restrictions to such cross-gender friendships. In addition, gender segregation is not confined to friendship, but to any kind of interaction between men and women. Interaction between men and women, when not relatives, is less common from a relatively young age. The country has high levels of gender separation in public settings, such as in schools, restaurants, work places, and other public gatherings (Hamdan, 2005).

Second, in Saudi Arabia, there is a strong consolidation between gender and labor market position (House, 2012). As mentioned, many women are inactive in the labor market. In addition, among those who are active, the unemployment rate is higher and the occupational status lower than that of men (CDSI, 2014). Taken together with the first condition – the fact that personal networks are strongly segregated by gender, this would imply that women have fewer occupational resources in their non-family network. Their connections to the labor market should come from family members, whereas we expect that men also have such job connections via friends and acquaintances. We therefore hypothesize that

- the personal networks of women are less occupational resourceful than that of men (H2a);
- this gender difference in network resources is only observed outside the family domain, while within the family circle, we do not expect to see gender differences in network resources (H2b).

We further elaborate on these hypotheses and also examine possible gender differences in personal connections to *specific* occupations. In Saudi Arabia, many jobs are strongly segregated by gender. When women do aim to work, not all occupations are possible. It is difficult for women to work in occupations in which there could be face-to-face contact with men. In the private sector, Saudi women used to work in a narrow range of jobs, such as private business and banking. Due to recent steps taken by the government to promote women's advancement in the labor market there are now over 450,000 women working in the private sector. The public sector is, however, the largest employer of Saudi women (Almunajjed, 2010). Around 85% of all working women are in education (teaching and administrative positions). Many women also find employment in medical occupations, such as a nurse (House, 2012). Given the gender segregation of personal networks and occupations, we expect that women in Saudi Arabia are having fewer personal connections to jobs that are only available to men, but that with respect to mixed jobs (i.e., work that can be done by either sex), these gender differences should be much less pronounced. We thus hypothesize that

- women have fewer connections to 'male only' jobs via their personal network than men, but such gender differences are less strong regarding 'male–female' jobs (e.g., nurse, teacher) (H3).

2.2. Nationality

We also expect to see that nationality is related to the size and resources of personal networks. Saudi Arabia has a large foreign-born population. It is estimated that around one-third of the population is an immigrant (House, 2012). Most foreigners come from Pakistan, Lebanon, Egypt, and India. Around 90% of the jobs in the private sector are occupied by immigrants, and 2/3 of all jobs are occupied by immigrants. Families often employ immigrant workers, as taxi-drivers, tutors for their children, maids. According to several scholars, immigrants are treated as second-class citizens (House, 2012).

It is not clear beforehand whether there is a difference between Saudi and non-Saudi in the *overall* size of their networks. We do, however, expect to see differences in ties to family and non-family members. Saudi nationals have more opportunities to interact with family and relatives, than non-Saudi national, many of whom do not have their family and relatives around. On the other hand, foreigners have higher rates of employment and are thus more strongly integrated in the labor market than Saudi nationals, which presumably imply they have more connections to workers than Saudi. In addition, non-Saudi nationals might be less strongly controlled by third parties, which give them more opportunities for social interactions with non-family, in public spaces. We therefore hypothesize that

- non-Saudi have smaller family networks than Saudi, but more extensive ties outside the family setting (H4).

We also expect to see that nationality relates to personal network resources. Two conditions are assumed to hold. First, we argue that due to language barriers, cultural differences, and the tendency of people to form ethnically homophilous ties (McPherson et al., 2001; Wimmer and Lewis, 2010), the personal networks of Saudi and non-Saudi will largely be disconnected from each other. Second, the employment rate of foreigners is higher than that of Saudi nationals. When combined, one would expect to see that overall, the personal networks of non-Saudi are more occupational resourceful than that of Saudi. However, on closer inspection, we expect this difference to occur only outside the family domain. Thus, friends and acquaintances of non-Saudi should be employed more often than non-family ties of Saudi. However, within the family, Saudi have more connections, and thus can compensate for their lower labor market participation – no differences between nationalities are expected in that domain. We hypothesize that

- the personal networks of non-Saudi are more occupational resourceful than that of Saudi (H5a);
- this difference in network resources is only observed outside the family domain, while within the family circle we do not expect to see differences between nationalities in network resources (H5b).

2.3. Education, employment and income (SES)

Next to ascribed characteristics, we also hypothesize that achieved characteristics affect the size and resources of personal networks. Specifically, we study the role of education, employment and income, which we together label as socio-economic status (SES). We assume that individuals with higher SES have more opportunities to participate in a wider range of and social activities and settings, allowing them to develop larger networks of non-family ties. Prior studies have indeed found evidence for this. For example, in a study of adults in the U.S., DiPrete et al. (2011) find that those who had more years of schooling, and who had higher income had more extensive personal networks. We assume that this is a cross-nationally universal pattern and expect to see the same in Saudi Arabia. However, we do not have theoretical reasons to expect that SES is related to family ties. We therefore hypothesize that

- SES is positively associated with personal network size (H6a);
- this association between SES and network size is only observed outside the family domain, not between SES and family ties (H6b).

Based on the homophily tendency and segregation of meeting opportunities by SES, individuals with a higher SES will be more likely to interact with other high SES people, i.e. who are higher educated, employed, and hold high-status jobs. Thus, we expect to see that SES positively correlates with access to occupational network resources. Earlier work has found evidence for this. Behtoui (2008, 2007), using data on 2349 employed people residing in Malmö, Sweden, found that education and work experience were positively related to occupational network resources. In the Netherlands, studies based on survey data showed that access to resourceful networks was higher among those who were higher educated and employed (Volker et al., 2008; Van Tubergen and Volker, 2015). More specifically, making the important distinction between family and non-family ties in this study, we hypothesize that SES only affects network connections outside the family, such as with friends and acquaintances. We therefore hypothesize that:

- the higher the SES of individuals, the more the network resources they have (H7a);

- this association is only observed outside the family domain, while within the family we do not expect to see such an association (H7b).

3. Data

Data for this analysis come from a survey among parents who participated as part of the Jeddah Youth Project (JYP), a project funded by King Abdulaziz University aimed at studying the life of youth and their parents in Jeddah City. It is thus important to emphasize that, as the survey was conducted in a specific city in Saudi Arabia, it is not representative for the population of the entire country. Jeddah is the second largest city in Saudi Arabia and host to many different ethnic groups. In addition, several large universities are located in Jeddah, and social control in the city is often considered as being less strict compared to the more traditional customs typical of more rural areas (House, 2012). Because of these and other differences, our study of Jeddah is the best seen as an exploratory study of the social networks of the population of Saudi Arabia.

In an attempt to assess the selectivity of the Jeddah context, we analyzed one of the few surveys that has been conducted in Saudi Arabia, which was conducted in 2005 among youth aged 18–25 and coordinated by the Michigan Population Studies Center (Kucinkas, 2010; Moaddel and Karabenick, 2008; Moaddel et al., 2005). The survey was conducted in three cities: Jeddah, Riyadh, and Dammam. At the time of the survey, Saudi Arabia had more than 26 million inhabitants: about 2.8 million lived in Jeddah, four million in Riyadh, the capital, and fewer than one million in Dammam. The survey used a representative sample of youths from Jeddah ($N=473$), Riyadh (321), and Dammam (160).

Using this survey, our analysis of gender attitudes shows no significant difference between youth in Jeddah and Riyadh (results available from the authors). However, youth in Dammam hold less traditional gender attitudes compared to those on Jeddah and Riyadh. We find the same pattern when analyzing whether parental approval or love is the foundation of marriage. In Dammam, youth are significantly more often in favor of 'love' being the foundation of marriage (as opposed to parental approval), as compared to their peers in Jeddah and Riyadh. Although in no way this is a comprehensive assessment of regional differences in gender roles, the evidence suggests heterogeneity in beliefs and practices in the Kingdom and thus underscores the exploratory nature of the current study on Jeddah.

The JYP is based on a stratified random sample of high school students in Jeddah. The first step in sampling design was to make a list of all public high schools in Jeddah City, a total of 268 schools with more than 100,000 students. Then we divided the schools based on two variables: sex and location. The next step we randomly selected five schools for boys and five schools for girls representing five geographic locations in the city: the North, the South, the Central, the East, and the West of Jeddah; two schools from each location. All schools were approached cooperated in the survey.

Three classes were then chosen from each school to represent tenth, eleventh, and twelfth grades. Survey questionnaires were distributed during class time with the permission of the school administration and the class teachers. A total of 1800 survey questionnaires were distributed. Each student who participated in the study by filling out the youth questionnaire (response rate 56.4%, $N=1015$) was given the parent questionnaire to have it filled out by one of his/her parent and then bring it back to the survey administrator at the school. Almost all parents filled in the questionnaire ($N=962$). We had to exclude parents of which their sex could not be determined ($N=125$). Data collection process spanned over 3

months starting from February 21, 2014. For the present study, we only rely on the survey of the parents.

4. Measurements

4.1. Network extensity

Estimating the size of personal networks is notoriously difficult. Different approaches have been suggested, each having its strengths and weaknesses. We used the summation method and asked about 'how many people' respondents know in different contexts, or role relations. The following introduction was provided in the survey:

We are interested in how many people you personally know. By 'personally knowing', we mean somebody to whom you might have a small talk if you meet him/her on the street and whose name is familiar to you.

How many persons do you personally know, who. . .

The question was asked with respect to four different types of networks: (1) family and relatives, (2) friends [not counting family and relatives], (3) neighbors, (4) people known from work, school and organizations. To facilitate respondents, several categories of different network sizes were provided in the survey (Cf. DiPrete et al., 2011). These were: (1) 0–5, (2) 6–10, (3) 11–20, (4) 21–50, (5) 51–100, and (6) more than 100 persons.

Self-reported measures of network size can be an over- and underestimation of the true network. A source of bias that is specifically associated with the summation method is the possible overlap between different domains (e.g., neighbors can be friends). However, studies which compared the summation with another approach to estimate the size of personal networks, the scale up methodology, revealed a strong association between their estimates (McCarty et al., 2001).

4.2. Network occupational resources

A short position generator measure was included in the survey. The position generator is a measure of the 'instrumental' dimension of social capital (Chen, 2009; Erickson, 2004; Lin, 2001; Lin and Dumin, 1986; Lin et al., 2009; Van der Gaag, 2005) and it measures the occupational resources of the strong and weak ties within people's network. The position generator captures the connections that people have to other people with different occupations. Often, it is assumed that knowing more different occupations (diversity and extensity), and having access to higher status jobs (highest reach) generates more of this kind of instrumental, occupational-related, social capital (Lin, 2001; Lin and Erickson, 2008). It is a specific and instrumental aspect of social capital, which does not cover the broader notion of social capital, and it is often used in the literature (e.g. Behtoui, 2007; Bourdieu, 1986; Burt, 2005; Chen, 2009; Coleman, 1988; Cross and Lin, 2008; Lai, 2008; Li et al., 2008; Lin, 2001; Lin and Dumin, 1986; Lin et al., 2009; Putnam, 2000; Van der Gaag, 2005; Van der Gaag and Snijders, 2005; Van der Gaag et al., 2008).

In the survey we used, respondents were shown a list of seven occupations. A more extended list of occupations would have been preferable. This rather short version of the position generator was used to reduce response burden. This was particularly important, because for each of the seven occupations, respondents additionally asked whether the job connection was (a) family or relative, (b) friend, or (c) acquaintance. Asking these additional questions increased survey time considerably, therefore the number of occupations asked must be kept short. Specifically, the original framing of the question was as follows:

Here is a list of some of the different occupations that people can have. Does someone of your family, your friends, or acquaintances have one of these occupations? An acquaintance is considered as somebody to whom you might have a small talk if you meet him/her on the street and whose name is familiar to you. Please tick all that apply.

The seven occupations that were asked for, were selected on the basis of three criteria. First, they should be rather well-known, common occupations. Second, they should represent occupations from low to high statuses. Third, some occupations should be male/female. Based on these criteria, we include the following occupations: (1) lawyer, (2) director of a company, (3) police officer, (4) secretary, (5) sales person, (6) nurse and (7) teacher. Both (1) and (2) are high status, male-only occupations; (3), (4) and (5) are middle/lower status, male-only occupations, and (6) and (7) are middle/lower status, male and female occupations.

4.3. Independent variables

We include variables for *gender* (male = 1, female = 0; 55% male), and *nationality* (Saudi = 1, non-Saudi = 0; 61% Saudi). Respondents were not asked about their country of birth or their ethnicity, and we therefore cannot differentiate between ethnic and immigrant groups. A dummy variable for the *highest education* obtained was included (master or doctorate = 1, rest = 0; 11% master/doctorate), as well as a variable indicating whether the respondent was currently *employed* (1 = yes, 0 = no; 64% employed). With respect to *monthly family income*, five groups of income categories a month (in Saudi Arabian Riyal, SA; 1 SA ~0.26 US Dollars) were presented (1 = less than 5000, 2 = 5000–10,000, 3 = 10,000–15,000, 4 = 15,000–20,000, 5 = 20,000 or more). We included dummy variables to represent these income groups. We also included a control variable *couple*, to indicate whether the respondent was living together with a partner or spouse (1 = yes, 0 = no; 88% couple). Prior research has shown that being single is associated with having a less resourceful network (Song, 2012).

5. Results

5.1. Network extensity

Our first set of findings is about individual differences in the size of personal networks. Table 1 presents the descriptive findings for the question on network size. It can be seen that many connections are with family and relatives. To illustrate, around 31% of the respondents in the survey indicate that they know more than 100

Table 1
Gender, nationality and personal network size.

	Number of people known who are. . .			
	Family	Friends	Neighbors	Work and school
<i>Total population (%)</i>				
0–5	9	9	21	15
6–10	10	16	28	12
11–20	15	18	25	17
21–50	19	23	15	20
50–100	17	17	7	16
More than 100	31	17	4	19
<i>By category (% >100)</i>				
Male	33	20	4	23
Female	28	13	4	15
Saudi	31	15	3	18
Non-Saudi	31	18	5	22

Note: Survey question: 'How many persons do you personally know who are (family or relatives/friends/neighbors/people you know from work or school)'.

Table 2
OLS regression of number of people personally known, in total (Y1) and per domain: family (Y2), friends (Y3), neighbors (Y4) and work and school contacts (Y5).

	Y1: total	Y2: family	Y3: friends	Y4: neighbors	Y5: work and school
Male	24.629 [*] (13.096)	4.267 (5.134)	8.734 ^{**} (4.358)	2.915 (2.872)	9.371 ^{***} (4.597)
Saudi	-18.896 (13.598)	3.335 (5.282)	-7.718 [*] (4.477)	-2.197 (2.945)	-9.320 [*] (4.768)
Master/doctoral	11.408 (18.520)	-6.603 (7.325)	4.374 (6.214)	3.966 (4.098)	8.885 (6.508)
Employed	24.128 [*] (13.793)	-1.761 (5.372)	7.074 (4.559)	5.165 [*] (3.018)	14.492 ^{***} (4.853)
Family income (Ref. <5000)	0	0	0	0	0
5000–10,000	-16.698 (16.332)	-7.575 (6.278)	-7.420 (5.317)	-3.689 (3.533)	-2.101 (5.703)
10,000–15,000	-7.246 (19.296)	-5.849 (7.499)	-0.548 (6.373)	-7.968 [*] (4.187)	7.821 (6.788)
15,000–20,000	12.746 (20.864)	1.056 (8.089)	0.689 (6.871)	-0.929 (4.591)	8.883 (7.306)
>20,000	39.444 [*] (20.558)	6.517 (8.045)	12.912 [*] (6.844)	-1.221 (4.522)	18.189 ^{**} (7.254)
Couple	45.517 ^{***} (19.207)	23.763 ^{***} (7.440)	8.962 (6.304)	0.981 (4.150)	1.802 (6.754)
Constant	133.357 ^{***} (20.157)	47.278 ^{***} (7.736)	36.928 ^{***} (6.577)	20.860 ^{***} (4.322)	35.881 ^{***} (7.086)
Observations	642	700	695	667	680
R-squared	0.051	0.026	0.043	0.021	0.061

Note: Presented are unstandardized coefficients.

^{*} $p < 0.1$ (two-tailed).

^{**} $p < 0.05$ (two-tailed).

^{***} $p < 0.01$ (two-tailed).

Standard errors in parentheses.

family and relatives personally. Connections to neighbors are less extensive; those with friends and people known from school, work or organizations fall in between these two extremes.

It was hypothesized that the personal networks of women are smaller than those of men in Saudi Arabia (H1a), and that this is not due to gender differences in family connections, but rather to men having more connections outside the family circle, with friends, neighbors and acquaintances (H1b). On a bivariate level, Table 1 provides some evidence for these hypotheses. Connections to family hardly differ between men and women, when we examine the percentage knowing more than 100 family members or relatives. Furthermore, it appears that men have more friends, and also know more people personally from work and school.

To test whether these differences are statistically significant and remain when we take other variables into account, we estimated OLS regression models of network size. Midpoints were assigned to the original intervals, and we assigned the value of 150 persons to the 100+ category.¹ The results are presented in Table 2. The first column shows the findings of the total network size, which sums up the four specific network sizes. In line with H1a, we find that women have fewer ties, on average 24.6 less than men, the difference being statistically significant. The disadvantage is largely due to women having fewer friends (-8.7 persons) and fewer people at work, school and organizations (-9.4). Connections to family are evenly distributed. These observations support H1b.

We expected that non-Saudi have smaller family networks than Saudi, but more extensive ties outside the family setting (H4). Table 1 shows that, unexpectedly, there is no difference in connections to family, and this conclusion remains in the multiple regression models (Table 2). In line with expectations, however, we do find that non-Saudi have more extensive networks outside the family domain, in particular with friends (+7.7) and at work and school (+9.3).

We also hypothesized that the higher the SES of individuals, the more extensive is their personal network overall (H6a), due to more outside family connections (H6b). In support of this

¹ We used OLS regression models instead of nonlinear techniques because of the many attractive features of linear regression models (Mood, 2010). Furthermore, the findings are easier to interpret. To check the robustness of the findings; however, we estimated two additional models. First, we estimated interval regression models, which are suitable when the data are such that we know in which category the observation falls (e.g., network size 6–10), but not the exact value of the observation. Second, given the fact we have count data, we also run Poisson models. We performed the analysis with STATA 13, and the substantive conclusions of both additional analyses are the same as we present.

hypothesis, Table 2 shows that respondents who worked at the time of the survey, have more connections (+24.1). In addition, we find that people in the highest income category (i.e., family income a month of more than 20,000 SR) have significantly more personal ties (+39.4 compared with the lowest income category). There are no statistically significant differences by education. In line with expectations (H6b), we do find that the differences in SES are found outside the family domain, and not within the family.

Although no hypothesis was formulated about the influence of living together with a partner, it seems relevant to mention that this variable is strongly associated with network size. Those who are living together know 45.5 persons more than those who are single, widow or divorced, and this difference is mostly due to knowing more family members and relatives (+23.8).

5.2. Occupational resources of networks

Regarding individual differences in the resources of networks, we hypothesized that the personal networks of women are less occupational resourceful than that of men (H2a), and that this is entirely due to gender differences in network access to occupations outside the family domain (H2b). As a first test of these hypotheses, we consider bivariate associations. The results presented in Table 3 tend to be in line with expectations. For example, we find that 19% of male and 20% of female respondents personally know a family member or relative who is a lawyer. However, when we consider friends and acquaintances, it seems that women have fewer such connections to lawyers. Thus, among men, 16% have a friend who is a lawyer, as opposed to 6% among women. Similar differences also occur with respect to other occupations.

To test the significance of these differences, while also controlling for other variables, Table 4 presents the results of the OLS regression models. In line with expectations (H2a), we find that even when taking other variables into account, women have less occupational resourceful networks. The difference is statistically significant ($p < 0.01$) and amounts to knowing 0.6 persons less (on a scale ranging from 0 to 7). Equally supportive of the hypothesis (H2b) is that this difference is not due to gender differences in occupational resources in the family. Rather it is because women have less resourceful friendship networks (-0.5) and knowing fewer acquaintances with various occupations (-0.2).

We further expected that women have as many connections to 'male-female' jobs, but less access to 'male only' jobs through their personal network (H3). To test this hypothesis, we run OLS regression models, with three different dependent variables counting the number of people personally known who hold: (Y1) male only,

Table 3
Gender and occupational network resources. Presented are percentages.

	Male			Female		
	Family	Friends	Acquaintances	Family	Friends	Acquaintances
Lawyer	19	16	14	20	6	5
General manager/director	31	25	19	29	8	12
Secretary	14	19	20	12	9	9
Policeman	33	25	18	37	9	13
Salesperson	28	22	20	38	7	12
Teacher	49	24	21	52	16	13
Nurse	22	9	16	28	7	15

Note: Survey question: “We are interested in how many people you personally know. By ‘personally knowing’, we mean somebody to whom you might have a small talk if you meet him/her on the street and whose name is familiar to you. How many persons do you personally know, who are ... (occupation title).”

Table 4
OLS regression of number of people personally known with certain occupations, in total (Y1) and per domain: family (Y2), friends (Y3) and acquaintances (Y4).

	Y1: total	Y2: family	Y3: friends	Y4: acquaintances
Male	0.626*** (0.235)	-0.065 (0.146)	0.451*** (0.124)	0.240* (0.130)
Saudi	-0.201 (0.241)	0.400*** (0.150)	-0.293** (0.128)	-0.308* (0.133)
Master/doctoral degree	1.371*** (0.322)	0.383* (0.201)	0.671*** (0.171)	0.318* (0.178)
Employed	0.093 (0.249)	-0.598*** (0.155)	0.295** (0.132)	0.395*** (0.137)
Family income (Ref. <5000)	0	0	0	0
5000–10,000	0.416 (0.296)	0.200 (0.185)	-0.123 (0.157)	0.340** (0.163)
10,000–15,000	0.913*** (0.336)	0.654*** (0.210)	-0.085 (0.178)	0.345* (0.186)
15,000–20,000	0.817** (0.365)	0.619*** (0.228)	0.025 (0.194)	0.172 (0.202)
>20,000	0.872** (0.359)	0.463** (0.224)	0.238 (0.190)	0.172 (0.198)
Couple	0.065 (0.318)	0.185 (0.198)	0.031 (0.169)	-0.151 (0.176)
Constant	3.030*** (0.341)	1.640*** (0.213)	0.642*** (0.181)	0.748*** (0.188)
Observations	540	540	540	540
R-squared	0.095	0.099	0.114	0.069

Note: Presented are unstandardized coefficients.

* $p < 0.1$ (two tailed).

** $p < 0.05$ (two tailed).

*** $p < 0.01$ (two tailed).

Standard errors in parentheses.

Table 5
OLS regression of number of people personally known with certain occupations: Y1 (‘male/high-status jobs’), Y2 (‘male/middle-low status jobs’) and Y3 (male–female, middle-low status jobs).

	Y1: male/high status jobs	Y2: male/middle-low status jobs	Y3: male–female/middle-low status jobs
Male	0.275*** (0.084)	0.408*** (0.118)	-0.033 (0.086)
Saudi	-0.199** (0.087)	-0.106 (0.122)	0.148* (0.088)
Master/doctoral degree	0.520*** (0.115)	0.558*** (0.163)	0.307*** (0.116)
Employed	-0.061 (0.089)	0.115 (0.125)	-0.007 (0.090)
Family income (Ref. <5000)	0	0	0
5000–10,000	0.300*** (0.106)	0.069 (0.149)	0.108 (0.107)
10,000–15,000	0.491*** (0.121)	0.087 (0.171)	0.298** (0.123)
15,000–20,000	0.453*** (0.130)	0.212 (0.183)	0.254* (0.131)
>20,000	0.477*** (0.130)	0.137 (0.183)	0.221* (0.131)
Couple	0.055 (0.116)	-0.018 (0.163)	0.119 (0.118)
Constant	0.697*** (0.125)	1.325*** (0.173)	1.038*** (0.126)
Observations	587	563	601
R-squared	0.115	0.069	0.055

Note: Presented are unstandardized coefficients.

* $p < 0.1$ (two tailed).

** $p < 0.05$ (two tailed).

*** $p < 0.01$ (two tailed).

Standard errors in parentheses.

high-status jobs (lawyer, director/general manager); (Y2) male only, middle/low status jobs (policeman, secretary, salesperson); (Y3) male and female, middle/low status jobs (teacher, nurse). The results are presented in Table 5.

In line with expectations (H3), we find that women have fewer connections than men in their network to people with ‘male only, high-status jobs’, the difference being statistically significant ($b = -0.28, p < 0.01$). Also with respect to ties to ‘male only, middle/low status jobs’, we see such gender differences ($b = -0.41, p < 0.01$). As expected, men and women have equal access in their personal network to people with ‘male and female’ occupations.

Are there any differences across nationality in network resources? It was hypothesized that non-Saudi have more overall occupational resourceful networks (H5a), due to having more job connections outside the family domain (H5b). Table 6 presents the bivariate associations between nationality and occupational network resources. A clear pattern cannot be found, although there are some occupations that are overrepresented in the networks of non-Saudi individuals (like salespersons) or underrepresented (like policemen and teachers).

The OLS regression models (Table 4) show that there is not a statistically significant difference between Saudi and non-Saudi

Table 6
Nationality and occupational network resources. Presented are percentages.

	Saudi			Non-Saudi		
	Family	Friends	Acquaintances	Family	Friends	Acquaintances
Lawyer	18	12	14	17	10	6
General manager/director	36	16	16	29	22	19
Secretary	14	17	15	15	14	17
Policeman	49	18	14	11	18	19
Salesperson	23	12	15	46	20	18
Teacher	64	18	17	37	26	21
Nurse	30	9	15	18	8	16

Note: Survey question: “We are interested in how many people you personally know. By ‘personally knowing’, we mean somebody to whom you might have a small talk if you meet him/her on the street and whose name is familiar to you. How many persons do you personally know, who are . . . (occupation title).”

nationals in the overall network resources, contradicting H5a. In line with expectations (H5b), however, we do find that among their friends and acquaintances, non-Saudi individuals have more job connections. The reason why there is no overall difference in network resources, is that Saudi individuals have more occupational resources in their family network, which compensates for having less access to jobs outside the family domain.

Finally, we test the hypotheses on the influence of achieved characteristics on network resources. It was hypothesized that the higher the SES of individuals, the more the network resources they have (H7a), due to having more job connections outside the family domain (H7b). We find that those with the highest education obtained (i.e., master or doctoral degree) know more people personally with certain occupations (Table 4). They have more occupational resourceful friends and acquaintances, as expected, but also tend to have more resourceful family members, which was not predicted. The results presented in Table 5 show that those with a master or doctoral degree know more people at different segments of the labor market (i.e., both higher and middle/lower status jobs), and both ‘male only’ and ‘male–female’ occupations.

Although education is a key indicator of SES, it is not the only measure of SES. Regarding labor market participation, we find, as hypothesized, that those currently having a paid job have higher occupational network resources among their friends and acquaintances. This advantage is, however, offset by having less resourceful family connections. With respect to family income, we find evidence to suggest that those with higher income have more overall occupational network resources, but surprisingly, this difference is mostly found in the family domain (Table 4). The highest income groups do have statistically significant more connections to high status jobs (Table 5), as would be expected.

5.3. Ascribed vis-à-vis achieved characteristics

An important aim and contribution of this study are to assess the relative importance of ascribed versus achieved characteristics as driving forces of network inequality. How important, for example, is the ascribed status of ‘women’ compared to the achieved status of ‘having a job’? To assess the magnitude of effects, we consider again the findings for the overall network size and network resources in Tables 2 and 4, respectively.

Disregarding the statistically insignificant findings, and considering net effects first, we find for the ascribed characteristics that women have 24 fewer social connections than men (Table 2, Y1; nationality n.s.). Achieved status, however, has a bigger net impact: having a job (+24) and having the highest family income (+39) together result in a difference of 63 persons. These comparisons, however, pertain to net differences and disregard the possible ways in which gender differences in SES are created in the first place, and via SES affect network size. The gross difference between men and women in network size is 40 contacts (analyses not presented

here); thus, the reduction of +40 to +24 is due to men having higher SES (education, employment rate, income) than women. However, even the gross difference of 40 contacts is lower than the 63-person difference due to SES. Thus, even in conservative Saudi Arabia, the achieved characteristics seem more important in getting access to a wider variety of social ties than ascribed social categories as gender.

Regarding network resources, we find a similar pattern. Specifically, women have a net disadvantage of 0.6 job-connections (Table 4, Y1; nationality n.s.), a difference smaller than having a master/doctoral degree (+1.37) and having the highest family income (+0.87). The gross difference in gender is 0.77, which suggests that the ascribed characteristics of gender and nationality are less predictive of inequality in job-connections than achieved status.

6. Conclusions and discussion

This study aimed to contribute to the literature, by developing and testing hypotheses about the extensity and resources of various networks, i.e. family ties and non-family connections (e.g. friends, acquaintances, and work/school ties). Thus, rather than studying the size or resources of the overall network (e.g., (McCarty et al., 2001) or only a specific network (e.g., core discussion network; McPherson et al., 2006), we contributed to the social capital and network literature by developing hypotheses on differential effects (Cf. Chua, 2013). We regard this as an important step toward understanding the inconsistent and inconclusive findings of earlier work on inequality in personal networks and network resources. Specifically, we formulated hypotheses which specify that some social categories have larger networks or more resourceful networks of one type (e.g., family), but smaller or less resourceful networks of another type (e.g., friends). The context of the study was Saudi Arabia, and we studied the role of two ascribed characteristics – gender and nationality – as well as achieved characteristics: education, employment and income. Another important aim of this study was therefore to assess the relative importance of ascribed vis-à-vis achieved characteristics in generating network inequality. Analyses were based on unique survey data conducted among parents in Jeddah in 2014. Four major conclusions can be drawn from this study.

First, we find gender differences in both the size and occupational resources of networks, all findings being in line with theory. The personal networks of women are smaller than those of men in Saudi Arabia, the difference presumably being due to men having more connections outside the family circle than women, with friends, neighbors and acquaintances. Furthermore, and unrelated to women having smaller networks, we also find that the personal networks of women are less occupational resourceful than that of men. This difference is affected by women having fewer resourceful friends and acquaintances than men. When we consider this gender difference more closely, we find that women have

as many connections as men have to mixed 'male–female' jobs, but they do have less access to 'male only' jobs in their network. On a more theoretical level, these observed gender differences in the size of networks are in line with what would be expected from the presumed role of opportunities and third party control. They reflect the fact that in Saudi society women face more restrictions to move around freely than men, and thus emphasize the more general notion that institutions play a key role in getting access to social capital (Chua, 2013). Because personal networks are strongly segregated by gender in Saudi Arabia – possibly the result of gender homophily, separation of meeting opportunities and normative expectations – and because of the consolidation between gender and employment in the labor market, the occupational resources in female networks are restricted to women only jobs. It should be emphasized that as our study relied on a survey in Jeddah, such gender differences network size and resources are possibly different elsewhere in Saudi Arabia, depending on gender norms and social practices.

Second, we find some differences in personal networks by nationality in Saudi Arabia. Non-Saudi individuals have more extensive ties outside the family network, as was expected. Surprisingly, however, we do not find differences between Saudi and non-Saudi in their connections to family. Possibly, non-Saudi have strong connections to family in their homeland, as the question was not specifically about the family they have in Saudi Arabia. Modern communication technologies make long-distance ties easier to maintain, thereby overcoming traditional (geographical) boundaries to social interactions (Rainie and Wellman, 2014). It was furthermore found that non-Saudi have about equal occupational resourceful networks as Saudi, which appeared to be due to non-Saudi having more job connections outside the family domain, and Saudi individuals having more resourceful family members. These findings support the notion that, given the higher employment rate of foreigners, and assuming that personal networks are segregated along nationality, the friendship and acquaintances networks of non-Saudi are more occupationally resourceful.

Third, we find evidence to suggest that individuals with a higher SES have more extensive personal networks in Saudi Arabia. This provides evidence to suggest that the linkage between SES and network size is a cross-culturally universal pattern, as it has been found in prior work in western countries as well (DiPrete et al., 2011). Furthermore, we also find that SES is connected to network resources. Those with a higher education and higher income have more resourceful networks outside the family domain, as was expected. Although higher income groups do have family members with more resources, unexpectedly they do not have friends and acquaintances who are more resourceful. Possibly, individuals belonging to rich families do not deliberately invest in making connections to resourceful friends, as they do not need to have such ties to get ahead.

Fourth, our study suggests that achieved status is more important in generating network inequality – both size and resources – than ascribed status. This does not mean that Saudi Arabia is a meritocratic society in which gender and other ascribed categories do not play a role. On the contrary, the network disadvantage that women face in Saudi Arabia is substantial, both 'indirectly' (via limited opportunities in the labor market), and 'directly' (after taking gender differences in SES into account). Nevertheless, our findings suggest that obtaining high qualifications, getting a job and high income (i.e., SES) seem more powerful determinants of both network size and resources. Although women in Saudi Arabia are behind in precisely these achieved status positions, thus affecting network inequality indirectly via achieved SES, even gross gender differences in network inequality are not equally strong as the *net* differences in network inequality by socio-economic status.

We suggest several ways in which future studies could elaborate on our research. To begin, it remains to be seen whether the conclusions of this study hold when different measures of network size and the position generator are used. As discussed, the network size measure is potentially biased, and alternative methods have been developed (McCarty et al., 2001). The position generator was short and possibly sensitive to the specific occupations that were included. It should also be emphasized that we did not measure the tie-generating mechanisms (opportunities, homophily and third party control) directly, which means that our study does not prove that these are at work. Also, we make use of data that are not nationally representative. Clearly, our study is exploratory and using a nationwide sample of individuals is preferable. Also, interviewing respondents repeatedly would give us more understanding of the importance of achieved characteristics (education, employment and income), which might be partly endogenous to the size and resources of personal networks.

In doing so, further work on social capital and personal networks is encouraged to elaborate on the theoretical framework developed in this study, i.e. to study the role of opportunities, homophilous preferences and third party control in the development of *domain specific* social ties (Cf. Chua, 2013). This results in a more fine grained study of individual differences in personal networks and inequality in family and non-family resources. And in that way, possible inconsistencies in findings across studies can be explained. Thus, if one study finds gender differences in network size whereas the other study does not, this may well be due to differences in the type of network size studied (e.g., family, friends, acquaintances). The current study showed, for example, no gender differences in the number of family members known, while at the same time women have smaller friendship networks than men. It is for this reason, that we encourage future work to hypothesize about how gender, nationality, SES and other social categories are related to *domain specific* social networks.

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