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THE POSITION GENERATOR IN THE NEPS

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The Position Generator in the NEPS

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The Position Generator in the NEPS

Abstract

The position generator is an established survey instrument to measure the status composition of actors' egocentric social networks. This paper sets forth the theoretical background of the position generator by providing a brief overview of social capital theory and the mechanisms through which social capital can affect educational outcomes. Against this background, it details the version of the position generator implemented in all NEPS starting cohorts. The NEPS position generator is intended to measure respondents' social resources by giving a range of 13 professions and asking respondents whether they personally know someone who pursues this profession and if so, about the ethnic background of this person. We analyzed the scientific use files of four NEPS starting cohorts to test the reliability and validity of the instrument and to describe corresponding distributions. Results show that the instrument performs well over all starting cohorts. We found consistent differences between migrants' and natives' social networks in terms of number of contacts, mean status composition and ethnic composition of the network. Likewise, respondents' occupational status is associated with their social network's status composition. Finally, we examined changes in network composition over a four-year span and found that networks do change over time, with a propensity to increase as respondents age and advance in their careers. We are confident that the position generator is well suited to measure differences in respondents' social capital and to examine inter-group differences.

Keywords

social capital, position generator, social networks

1. Introduction

Since their development in the 1980s, social capital theories made a stellar career in the social sciences. Scholars use them to better understand educational inequality, status transmission, labor market integration but also group coherence and political participation (cf. e.g., Brandt, 2006; Coleman, 1988; Dufur, Parcel & Troutman, 2013; Krug & Rebien, 2012; Moerbeek & Flap, 2008; Morgan & Todd, 2009; Mouw, 2006; Weiss & Klein, 2011; Yakubovich, 2005). Moreover, social capital has been identified as a crucial factor for immigrant integration, especially for educational attainment and labor market integration (cf. esp., Portes, 2008). A key reason for the steep career of ‘social capital’ is that—under the same label—different concepts have been developed simultaneously in different fields. The concepts proposed by Bourdieu (1986), Burt (1992, 2001), Coleman (1988, 1990), Lin (1982, 2001), and Putnam (1993, 1995, 2000) are probably the most influential contributions, each of them inspiring a vast number of empirical applications (for reviews, cf. e.g., Adam & Roncevic, 2003; Castiglione et al., 2008; Flap, 1999; Field, 2008; Lin & Erickson, 2008; Van Deth, 2003).

Despite meaningful differences between the various concepts of social capital, there is one significant commonality: Social capital is usually defined with reference to the *resources accessible through social networks*. The common thread of the various social capital concepts is that networks give access to some kind of resource, which individuals can use to achieve their goals. Besides the configuration of networks, the resources that one’s contacts possess are the main determinant of social capital (see, e.g., Lubbers et al., 2010). Social capital is thus contingent on the economic, human, and cultural capital as well as the prestige, status, and power of one’s contacts (cf. esp., Bourdieu, 1986).

Given the link between the resources controlled by an actor’s contacts on the one hand and her endowment with social capital on the other, it is hardly surprising that the distribution of social capital tends to mirror the distribution of other forms of capital. This fact is a result of both *preferences for relationships* with others who are similar to oneself and *more opportunities to meet similar others*, for instance, in school or at the place of work. Interpersonal networks, consequently, tend to be homogeneous in terms of attitudes, world views, and lifestyles and in terms of education and socio-economic status. Members of the middle or upper class, accordingly, tend to be embedded in networks with a higher socio-economic status than members of the lower classes (Bourdieu, 1986; Lin, 1999, 2001).

Lin (2001) summarized social inequality in endowment with social capital in his *strength-of-position proposition*:

“This proposition predicts a structural effect on social capital: those in better social positions will have the advantage in accessing and mobilizing social ties with better resources.” (Lin, 2001: 65)

According to this proposition, actors in higher socio-economic positions not only have *access* to more social resources but can also *mobilize* them more easily than actors in lower positions. Lin (1999, 2001), moreover, underlines that the effect of an actor’s socio-structural positioning on her social capital endowment is stronger than the well-known effects of network configuration, such as the strength of (weak) ties.

In light of the importance of socio-economic network composition for one's social capital endowment—and its effects on individual outcomes such educational attainment, labor market participation, or status transmission— a specific survey instrument has been developed: the position generator (cf. esp., Lin & Dumin, 1986; Lin & Erickson, 2008; Lin, Fu & Hsung, 2001; Van der Gaag, Snijders & Flap, 2008). It measures the status composition of an actor's network by providing respondents with a list of occupations of different social status and asking them to indicate whether they know anybody in that occupation. Under the assumption that contacts in higher socio-economic positions control more valuable resources, it therefore provides us with an indirect estimate of the social resources accessible through an individual's wider network.

In this paper, we present the NEPS position generator. In the next section we set forth its theoretical background. Against this background, we discuss the fundamental methodological concerns that we considered in the development of the instruments and provide an overview of how the position generator is implemented across the different NEPS starting cohorts and the NEPS social capital framework (section 3). Finally, we describe the data as available in the Scientific Use Files of several NEPS cohorts by now and draw conclusion along with some suggestions for the usage of the instrument.

2. Theoretical background

Social capital has been conceptualized in very different ways by scholars such as Bourdieu (1986), Coleman (1988), Granovetter (1973), or Lin (1999). In light of the diversity in its origins and frameworks, it is not surprising that social scientists mean quite different things when they refer to 'social capital'—a particularly large amount of conceptual ambiguity has often been criticized (cf. e.g., Adam & Roncevic, 2003; Esser, 2008; Van Deth, 2003). In order to reduce this ambiguity, it is helpful to differentiate between a collective and an individual concept of social capital (cf. e.g., Esser, 2008; Kriesi, 2007). Collective social capital covers the degree of trust, social control, cooperativeness, and the validity of norms in social collectives. In the second perspective, (individual) social capital is considered as a relation-based social resource. It covers, for instance, the exchange of information or support among friends. As the concept underlying the position generator is individual social capital, we focus on this form here.

Individual social capital refers to the resources that actors can access through the inter-personal networks and groups they belong to—and which they can use as productive means to achieve their goals. Individual social capital is a resource that actors can use to create (more) benefits (Lin, 1999: 30; Snijders, 1999: 29). The probably most cited definition of this form of social capital reads as follows:

"Social capital is the sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition." (Bourdieu & Wacquant, 1992: 119)

Inter-personal networks are the basis of individual social capital as it arises from an actor's relationships with others. It is a personal asset, although not controlled by the individual actor alone. Rather, it is situated in the relations between actors (Coleman, 1990; Loury, 1977).

2.1 Forms of social capital

Applying a broad definition of social resources, we identify six forms of social capital that represent five different ways how social capital operates. These five ways are: i) information, ii) instrumental support, iii) social credibility and credentials, iv) emotional support and social recognition, and v) the norms, values, and orientations predominating in a certain network or group. In the following paragraphs, we will briefly explain how these six forms of social capital function.

First, information is an important resource that flows through inter-personal networks. Actors often get to know about new opportunities through their social relations. Moreover, they gain insights into processes they would otherwise not understand. Parents, for instance, who are looking for a kindergarten place for their child, may receive information about new vacancies through their inter-personal networks. Erikson and Jonsson (1996) explain that information about the functioning of the school system contributes to the generation of educational inequality. Similarly, Dufur, Parcel, and Troutman (2013) argue that families with low levels of social capital provide less information and thus impair children's academic achievement. Information gathered through inter-personal ties reduces transaction costs. If friends or family members, for instance, keep their ears open and forward information on vacancies in childcare facilities to the person in question, that person saves time and search costs. Second, network-based information is particularly likely to lead to better matches between applicants and positions (see esp., Dustmann, Glitz, Schönberg & Brücker, 2015).

A second form of individual social capital is *instrumental support* or practical help. It can take many forms. A grandmother who regularly takes care of her grandchildren supports her daughter's career. Support means that others use their resources in order to enhance an actor's returns or to create benefits for him. This primarily refers to using time and the commitment of specific skills. In most cases, others' support directly reduces an actor's costs, which, in turn, gives her more leeway for achieving other goals.

The third form of individual social capital is the *social credibility and credentials accruing from one's inter-personal networks*. Whereas support yields returns through reducing an actor's costs and direct influence on third parties, *social credibility works indirectly*. Networks, especially mutual acquaintances, function as both *a leap of faith and a reassurance* for third parties. Inter-personal contacts, especially mutual acquaintances, signal an actor's trustworthiness and social acknowledgement—that is, they serve as an affirmation of his creditworthiness and soundness. What matters for our discussion of the position generator is the fact that the *credibility endorsed by a certain recommendation is a function of the prestige, status and positioning of the persons that provides it*.

Fourth, *emotional support and recognition* is a further form of social capital that is particularly important for mental and physical health (Ferlander, 2007). It functions by strengthening an actor's identity, self-worth and self-efficacy beliefs as well as his motivation and commitment. In this way, it also has indirect effects on educational and labor market success, as better mental health strengthens one's capability and employability. Emotional support is almost exclusively provided by strong ties: It is one's inner circle (partners, close family members, and friends) that usually provides attention, love, and security that

strengthens and stabilizes one's self-esteem. Strong ties make an actor feel that he is recognized and cherished, which is particularly important in difficult times, such as in case of severe illness or personal crises (Lüdicke & Diewald, 2007: 266f).

The *norms, values and orientations* that predominate in a certain group or network constitute a fifth form of social capital. Whereas the first four forms deal with resources in the narrow sense, this fifth form rests on a broad, rather metaphorical, understanding of resources. Norms and values primarily affect individual beliefs and motivations. Such effects can even (mis)lead actors to disregard other situational aspects or to ignore the consequences of a decision. In this way, networks can enforce educational aspirations or establish a normative environment that supports educational attainment (Coleman, 1988; Dijkstra et al., 2003; Thorlindsson et al., 2007; Sewell et al., 1970; Singer, 1981; Stocké et al., 2011). Group norms, however, are not necessarily positively interrelated with educational achievement and attainment—they can also transmit counter-productive norms or anti-social behavior, for instance, by promoting futility cultures (Agirdag, Van Houtte & Van Avermaet, 2012). Effects of group norms on individuals largely stem from the adoption of attitudes and behaviors of role models or the (often unconscious) internalization of peer norms. Group identification and a group's power to sanction behaviors that violate group norms are important conditions that influence the efficiency of reference group effects (Portes & MacLeod, 1999).

All five forms of social capital rely on resource transmission. As the diversity and subtleties of the five forms already suggest, it is difficult to develop direct measurements of social resources—in large-scale surveys, in fact, it is a hardly feasible task. The position generator therefore takes another approach: it indirectly assesses social resources through the status composition of the social network. It stems from the idea that control over resources is directly linked to an actor's position in the social hierarchy. According to Lin (2001), the social hierarchy takes the shape of a pyramid – a few actors in the positions at the top control the most valued resources, whereas the most common positions at the bottom control the least valuable resources. Ties to actors with a higher status therefore promise higher benefits, but ties to actors with a similar or lower status are more easy to establish and maintain due to the fact that these positions are more common and due to the homophily principle.

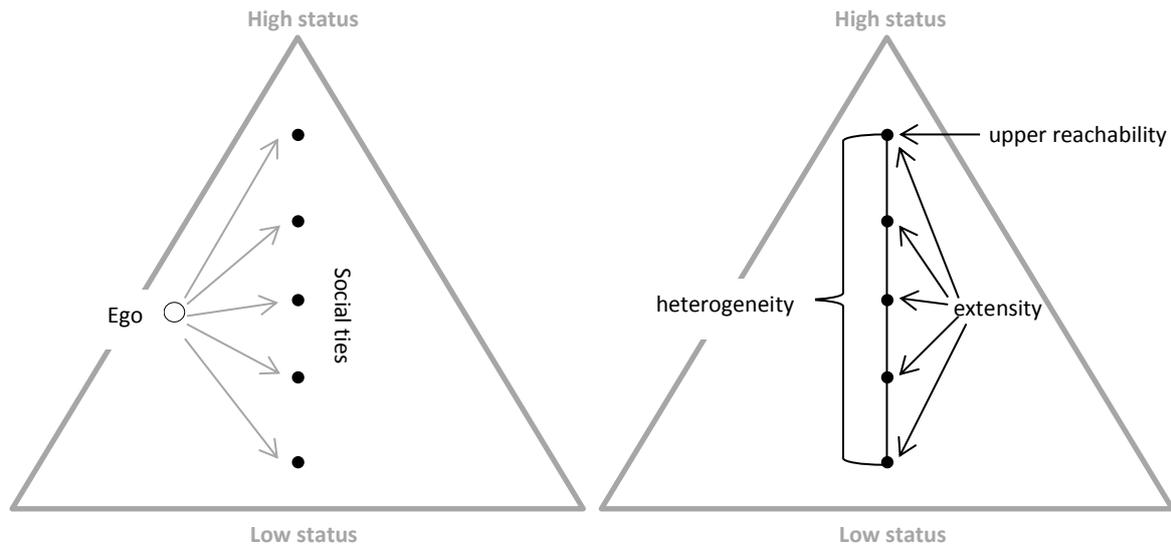


Figure 1: Ties within the status hierarchy and measures of social capital (Lin, 2001: 62)

Lin (2001: 62) suggests that an actor's endowment with social capital can be measured by three network characteristics: upper reachability, heterogeneity, and extensity (see Figure 1). Upper reachability refers to the highest social tie in the status hierarchy. In general, the five forms of social capital described above tend to be associated with the positioning or status composition of an actor's network in the same (positive) way: The higher the socio-economic positioning, the more resources of information and support are available; the higher the status of one's contacts, the more influence they can exert on others and the more social credibility is conferred. The same usually holds true for norms, values, and orientations regarding learning, education and career orientations: Such norms tend to rise with the socio-economic positioning of one's network.

However, not all social resources require high-status contacts; some resources are provided more cheaply and efficiently through ties to others who are of equal or lower social status. Examples include information about school events from a fellow parent, help with caregiving duties from the neighbor's child, or emotional support from close friends. It is therefore beneficial to have access to positions from different points in the status hierarchy. This characteristic is captured by the measure of network heterogeneity, which refers to the vertical range of positions that are accessible through social ties. The third measure, extensity, finally, captures the total number of positions that can be reached by an actor. Ceteris paribus, social capital increases with the number of positions that can be reached, because the number of accessible resources grows with each additional contact.

The first two measures, upper reachability and network heterogeneity, are directly linked to the well-known finding that ties to other social circles are particularly beneficial for both individuals and societies at large (cf. esp., Granovetter, 1973; Burt, 2001). Bridging ties, defined as those inter-personal relations that are the only links between otherwise disconnected groups or networks, are particularly valuable because they tend to connect actors that have less in common than actors in closely knit networks. They are, therefore, more likely to make available non-redundant information and disseminate news, for instance, about job openings. Moreover, bridging ties give access to further (scarce) goods

such as (affordable) housing or child care facilities. Bridging ties thus increase opportunities for individual and collective action by facilitating—or even enabling—interaction among distant actors.

The advantage of ties that bring together distant actors and groups is also critical for the differentiation between *bridging* and *bonding* social capital (Putnam, 2001). The crucial difference between the two concepts is exactly what we have just described: Wide networks provide actors with more diverse social resources than narrow ones. Bonding social capital, by contrast, refers to the idea that dense networks have a particular strength as well—they support the mobilization of social resources, especially of costly ones, which accrues from the capacity of dense networks to facilitate social control, (credits of) trust, shared identities, and solidarity.

2.2 Immigrant social capital: How ethnic communities matter

The distinction between bridging and bonding social capital is particularly prominent in integration research, especially in studies investigating the socio-economic incorporation of immigrant groups. For immigrants, bridging social capital is then mostly equated with having inter-ethnic ties, that is, ties to the majority population. Likewise, bonding social capital is equated with having intra-ethnic ties, that is, ties within the co-ethnic community (e.g., Heizmann & Böhnke, 2016; Koopmans, 2016). This distinction is based on the (well confirmed) assumption that immigrant groups are positioned in the lower rungs of the socio-economic hierarchy, thus providing them with less social capital. Inter-ethnic ties, by contrast, indicate bridging social capital because they connect immigrants with more distant others, who also tend to be better situated than co-ethnics. Inter-ethnic ties accordingly provide immigrants with more social capital, which, again, might strengthen socio-economic incorporation through all five ways discussed above.

Besides these general forms of social capital, the impact of further *immigrant-specific forms of social capital* on immigrant integration is vigorously debated in integration research. These specific forms mainly deal with the effects of ethnic communities that have always been identified as important factors shaping incorporation processes (see esp., Portes & Rumbaut, 2001). We identify four forms of immigrant-specific social capital (for the sake of simplicity we will refer to them as ethnic social capital).

First of all, the ethnic community is particularly important for newly arriving immigrants as it helps them to find guidance despite language barriers. The ethnic community offers easy access to crucial information, especially about typical matters that immigrants face upon arrival in a new environment, such as job search, (affordable) housing, administrative matters, specific shopping facilities, or medical aid. This first form of ethnic social capital largely follows from being able to communicate with each other. This argument, however, is not only about language barriers. It is also concerned with mutual understanding (e.g., of codes, customs, and modes of reaction)—it is linked to socio-cultural characteristics. Last but not least, fellow co-ethnics can more naturally put themselves in the position of newly arriving immigrants as they often share similar (defining) experiences—many community members once happened to be in similar situations.

Second, in response to the particular challenges that immigrants face, ethnic communities often develop particular institutions or organizations that help them to meet these

challenges. Prime examples of such organizations are cultural associations, religious communities, and youth centers, often headed by social workers from the community (Zhou, 2009). These centers are not only successful because they offer homework assistance and specially tailored activities that meet the needs of young immigrants but also because they are sensitive to group-specific norms and values—thereby, gaining the acceptance of both immigrant youth and parents.

Third, ethnic networks and communities can have protective effects. In particular, they can prevent adolescents from negative contextual influences, especially from adopting the counterproductive attitudes or behavior of disadvantaged groups with whom they come into contact. Immigrants do so more often than natives as they are more likely to grow up in disadvantaged neighborhoods. In contrast to others, ethnic networks are particularly likely to become protective shields against deprivation. This is because they tend to be denser than other networks, which fosters intergenerational closure and facilitates both social control and the enforcement of group norms (Portes & Rumbaut, 2001).

Fourth, for similar reasons ethnic communities might be able to promote achievement norms and values that favor educational and occupational attainment. Again, such arguments have mainly been pushed forward for the U.S., where Asian-Americans are seen as the prime example of (educational) success against the odds (cf. e.g., Zhou & Bankston, 1994; Zhou & Xiong, 2005). Similarly, Shah, Dwyer & Modood (2010) identify shared norms in Pakistani families in the U.K. as crucial factors that help understand why Pakistani student aim for better education than other groups.

Fifth, ethnic networks and communities may also be conducive to socio-economic advancement indirectly—through psychological mechanisms. They can reinforce identities, thereby, strengthening self-esteem and mental health, which, in turn, helps keep alive educational and occupational aspirations and motivations—even in hostile environments, that is, in case of discrimination or exclusion. Shared ethnic identities, moreover, strengthen ethnic solidarity, especially if they are endorsed by a sense of common destiny. Ethnic (in-group) solidarity, then, lets minority group members become more willing to share their resources with others. In other words, solidarity eases the mobilization of all kinds of social capital.

As our brief discussion of the five forms of immigrant social capital has already shown, whether or not ethnic networks and communities, eventually, foster socio-economic integration is conditional on both the resources and norms predominating in a community and corresponding network structure. Ethnic communities are neither solely a springboard nor solely a trap, as Zhou (2009: 1156) put it—, there rather exists a varied “spectrum of resources and constraints” that influence immigrant incorporation. Some effects even depend on further contextual factors, especially on the (non-)existence of ethnic boundaries and social acceptance by the majority population as well as on integration regimes (e.g., regulation of labor market access). This *conditional view* regarding the influence of ethnic networks and communities challenges us to specify much more precisely which resources, orientations, and values ethnic communities actually provide—and when they influence integration outcomes.

In order to make progress here, we need both measures of the different forms of social capital and measures of the ethnic composition of the corresponding networks. Having both of them allows us to differentiate between general forms of social capital and immigrant-specific ones. Since it is not feasible to measure the various forms of immigrant social capital directly, we need to include ethnic network composition as a proxy measure for identifying 'ethnic residuals' that might point to the significance of immigrant-specific social capital. The special focus of NEPS on education acquisition with a migration background (cf. Kristen et al., 2011) and the apparent lack in social capital data, were a main reason for the development of a comprehensive NEPS social capital instrument, especially for including measures of ethnicity in the position generator (for details, cf. Hoenig et al., 2016).

In order to be able to test the impact of social capital—and to evaluate its role in the generation of inter-group differences in educational achievement and attainment or labor market integration, it is crucial to obtain sound measurements. The position generator is designed to provide a reliable measurement of wide inter-personal networks. By providing a list of positions of different socio-economic status, the position generator can be used to measure the upper reachability, heterogeneity and extensity of an actor's network. This fact is the main reason why we implemented a short version of the position generator across the NEPS cohorts. In order to be able to distinguish between the general social capital mechanisms discussed in this section and the specific ways how ethnic networks function, we additionally asked for the country of origin of all persons indicated by the respondent in the position generator. In the following section we describe our measurement instrument and how we developed it.

3. Measurement concept and methodological concerns

In large-scale surveys, social capital is usually measured based on the survey participant's ego-centered network. In ego-centered measurement instruments, the individual respondent herself is the source of information about her social networks. She is regarded as a *focal actor* F who is connected to other actors A_1 to A_k (*alteri*) via social relations r . These alteri along with their connections to ego form F 's ego-centered network. Such approaches have long been implemented in survey research (see already, Burt, 1984; Fischer, 1982; Marsden, 1990). From the long list of social capital instruments that have been proposed, the most common ones¹ are (Häuberer, 2011; Van der Gaag & Webber, 2008): i) name generators, ii) the resource generator, and iii) the position generator. All these measurement instruments are part of the comprehensive NEPS social capital instrument. The rationale, layout, and development process of the NEPS social capital instrument has been described by Hoenig et al. (2016). In what follows, we confine ourselves to presenting the NEPS position generator as an integral part of the NEPS social capital instrument.

3.1 The measurement instrument in general

The position generator is a widely used social capital instrument (Lin & Dumin, 1986; Lin et al., 2001; Lin & Erickson, 2008). In contrast to other ego-centered social capital instruments, it is not meant to gather detailed information about particular contact persons but measures the status composition of an actor's wider network. It does so by surveying the ties of survey

¹ In their meta-analysis, Hlebec & Kogovsek (2013) also cover 'role generators' and 'event-related support networks'. As these two have a very particular focus and have not been considered for implementation in NEPS, we do not take them into consideration here.

respondents to persons in certain occupations. Respondents are asked to indicate from a list of occupations whether or not they personally know someone who pursues such a profession. These occupations range from low-status occupations, such as security guards or warehousemen, to high-status professions, such as lawyers or physicians. The approach is based on the assumption that occupations can be ranked according to the social status they entail—and that social status involves control over material and immaterial resources.

Social capital indicators derived from the position generator “are based on the idea that the occupations of network members represent social resource collections that can be quantified with job prestige measures” (Van der Gaag & Webber, 2008: 39). Accordingly, prestige scores are allocated to each profession in empirical application. Mostly, the Socio-Economic Index of Occupational Status (ISEI, cf. Ganzeboom, Degraaf & Treimann, 1992) is used. Depending on theoretical interests or substantial hypotheses, researchers can generate various social capital indicators, such as the mean ISEI of all professions reached or the heterogeneity of positions. The position generator, thus, facilitates mapping the status composition of ego’s wider network and available resources.

The position generator usually refers to weak ties. Such ties may include distant acquaintances, (former) colleagues as well as fellow members of clubs or other organizations to which someone belongs. Some versions of the position generator collect further information about the persons that obtain a certain occupation. Such details include the frequency of contact, how well the persons know each other, or the kind or strength of a relationship. If one does not add too many contextual questions, the position generator is a (time-) efficient measurement instruments with particularly low interviewee and interviewer burden (Chua, Madej & Wellman, 2011: 107). Interviewer misconduct and panel conditioning are therefore rather unlikely.

The position generator, of course, has its weaknesses as well. First of all, as it is designed to measure those aspects of social capital that influence instrumental actions, such as job search or occupational attainment, the position generator is not well-suited for covering those social capital dimensions that refer to expressive action (e.g., emotional support or recognition) (Häuberer, 2011: 140). Second, the social capital indicator gained through the position generator depends on the professions included in the list of occupations. At the same time, this list is sensitive to the concrete labeling of occupations. Accordingly, positions (and labels) need to be chosen in a way that suits all subgroups of the study population. This is by no means a given. Gendered labor markets, for instance, can bias results between men and women if the jobs listed in the position generator tend towards one group, that is, if there are primarily male or female dominated jobs in the list of occupations. Similarly, it has been shown that the position generator is less applicable for homemakers, pensioners or unemployed respondents than for those who are in the labor force (Häuberer, 2011: 141). Third, inter-cultural differences in norms or gender role beliefs can affect indicators derived from the position generator. Last but not least, although the position generator is specifically geared to measuring resource possession, it does so in a broad and indirect way—by ascribing prestige scores to occupational positions. Resource exchange or actual resource mobilization is not measured. The position generator is therefore of little help if one seeks to specify the exact channels through which social capital has an effect on certain outcomes.

3.2 The measurement in the NEPS

The position generator is an integral part of the NEPS social capital instrument. It includes measures of prospective and retrospective access to specific social resources, questions about the expectations and aspirations of friends, family members and peers, and parental involvement in their child's education. The latter instruments address more directly through which pathways social capital affects educational and labor market outcomes, but they are usually targeted to specific educational or labor market outcomes and lack the general scope of the position generator. Our overall strategy thus aims to combine the strengths of the position generator and more direct measures of resource access and mobilization. An overview of social capital instruments within NEPS can be found in Stocké et al. (2011). For an overview of the process of development, see Hoenig et al. (2016).

It is assumed that networks of professional contacts develop when actors enter the labor market and that actors rely on parental networks before that time (see Granovetter, 1974). Therefore, the position generator is administered to parents while respondents are still in school and only administered to respondents directly once they have left school.

In general, we try to include measures of the position generator shortly before important transitions take place, such as the transition to elementary school in Starting Cohort 1 or the transition into vocational training in Starting Cohort 4. In Starting Cohort 6, which tracks adults of all age groups, most of whom have finished formal education, we measure the position generator every four years. In Starting Cohorts 4 and 5, which track young adults through vocational training or university and then into the labor market, we plan repeated measures of the position generator around the time when subjects make the transition into the labor market. It will thus be possible to examine the development of respondents' professional networks and (for Starting Cohort 4) compare it with the parental network. An overview of realized and planned schedule for all Starting Cohorts can be found in Table 1.

Table 1: Schedule for position generator measurements in all NEPS Starting Cohorts

Starting Cohort	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1										P (W7)		
2					P (W3)							
3							P (W6)				T (W10)	
4		P (W1)				P (W7)				T (W11)		
5				T (W4)				T (W11)				T (W18)
6	T (W2)				T (W6)				T (W10)			

T: Position generator administered in target person interview

P: Position generator administered in parent interview

Entries for 2018-2020 reflect current plans and may be subject to change

We included a short version of the position generator in NEPS studies. Its basic shape comes close to common versions (cf. e.g., Lin, 1999) as sketched above. The biggest difference between the position generator implemented in NEPS and other versions is the number of occupational positions covered. Whereas a complete version of the position generator usually covers 30 to 40 occupations, our NEPS instrument covers only 13. This is a result of time restrictions. Developing a short position generator for the NEPS that would last no longer than 1.5 minutes, we referred to a version of the instrument that has been developed for the project “Young Immigrants in the German and Israeli Educational System” (for details, cf. Roth, Salikutluk & Kogan 2010; Kalter et al., 2013). Based on cognitive pretests and pilot studies, we adapted the labeling of several occupations and their ordering (for details about the development process and pilot studies, see Hoenig et al., 2016). Furthermore, we refined the ethnic network composition measurement: For each occupational position selected, the respondent is asked to indicate from which country the person occupying that position originates. This allows us to construct measures of both the share of alteri with a migration background and the share of co-ethnics in the respondent’s weak tie network.

The NEPS position generator was employed in several NEPS-studies, both for the studies’ main targets person as well as student’s parents in cohort 2 and 4. Currently, data for the position generator are available in the Scientific Use Files for starting cohort 2, 4, 5 and 6:

- SC2, kindergarten (Parents), wave 3 (2013), CATI
- SC4, students in grade 9 (Parents), wave 1 (2010), CATI
- SC5, first-year academic students (Target), wave 4 (2012), CAWI
- SC6, adults (Target), NEPS wave 1 (2009/2010), CATI/CAPI
- SC6, adults (Target), NEPS wave 5 (2013/2014), CATI/CAPI

The position generator was, to a large extent, measured consistently over these cohorts and waves with slight differences in wording, e.g. due to the different survey modes. Respondents were given a list of professions and were asked whether there is someone in their social circle (e.g. partner, family, relatives, friends, colleagues or other acquaintances) who currently works in this profession. If they answered that such a person exists, they were asked about this person’s country of origin (or the person closest to them, if there was more than one).

Table 2 describes the instrument as it was typically employed and gives English translations.²

² Please note that the English translations given in the NEPS Scientific Use Files might differ slightly.

Table 2: Question texts

Question/instruction - professions

Variable	German text	English translation (as used below)
	Ich werde Ihnen nun einige Berufe vorlesen. Bitte sagen Sie mir jeweils, ob Sie eine Person in ihrem persönlichen Umfeld kennen, die derzeit einen solchen Beruf in Deutschland ausübt. Mit persönlichem Umfeld meine ich z.B. Ihren Partner / Ihre Partnerin, Ihre Familie oder Verwandte, Ihre Freunde, Arbeitskollegen oder sonstige Bekannte.	I will now read out a few professions. Please tell me if there is someone in your social circle who currently works in this position. By 'social circle' I mean, for instance, your partner, your family, relatives, your friends, colleagues or other acquaintances.
	1 – ja	1 – yes
	2– nein	2– no
	-98 – weiß nicht	-98 – don't know
	-97 – Angabe verweigert	-97 – refused
t32600a	Kennen Sie in Ihrem persönlichen Umfeld eine Krankenschwester oder einen Krankenpfleger?	Does someone in your social circle work as a nurse or male nurse?
t32600b	Kennen Sie persönlich einen Ingenieur oder eine Ingenieurin, die ihren Beruf in Deutschland ausüben?	Do you know someone personally who works as an engineer in Germany?
t32600c	Kennen Sie persönlich eine/n Lager- oder Transportarbeiter/in?	Do you know someone personally who works as warehouse or transport worker ?
t32600d	Kennen Sie persönlich einen Sozialarbeiter oder eine Sozialarbeiterin?	Do you know someone personally who works as a social worker ?
t32600e	Kennen Sie persönlich einen Verkäufer oder eine Verkäuferin?	Do you know someone personally who works as a sales clerk ?
t32600f	Kennen Sie persönlich einen Polizisten oder eine Polizistin?	Do you know someone personally who works as a police officer ?
t32600g	Und kennen Sie persönlich einen Arzt oder eine Ärztin, die in Deutschland ihren	Do you know someone personally who works as a doctor/physician ?

	Beruf ausüben?	
t32600h	Kennen Sie persönlich einen Bankkaufmann oder eine Bankkauffrau?	Do you know someone personally who works as a banker ?
t32600k	Kennen Sie persönlich einen Kraftfahrzeugmechaniker oder eine Kraftfahrzeugmechanikerin?	Do you know someone personally who works as a car mechanic ?
t32600l	Kennen Sie persönlich einen Juristen oder eine Juristin, wie z.B. einen Anwalt oder eine Anwältin oder einen Richter oder eine Richterin?	Do you know someone personally who works as a legal practitioner (e.g. lawyer or judge)
t32600m	Kennen Sie persönlich einen Optiker oder eine Optikerin?	Do you know someone personally who works as an optician ?
t32600n	Kennen Sie persönlich einen Übersetzer oder eine Übersetzerin?	Do you know someone personally who works as a translator ?
t32600o	Und zuletzt: Kennen Sie persönlich einen Grund-, Haupt- oder Realschullehrer oder eine Grund-, Haupt- oder Realschullehrerin?	And finally, do you know someone personally who works as teacher at an elementary school, a Hauptschule or a Realschule?

Question/instruction follow-up question - country of origin for each profession

Variable	German text	English translation in the following
	Aus welchem Land stammt diese Person?	What country does he/she come from?
	[Herkunftsland]	[country of origin]
	-98 – weiß nicht	-98 – don't know
	-97 – Angabe verweigert	-97 – refused

4. Empirical Results across the NEPS cohorts

In this section, we describe the data as available as NEPS Scientific Use Files at this point. Due to systematic differences in sample selection and survey modes, differences *across* cohorts have to be interpreted with care. We therefore limit direct comparisons to parents of cohort 2 and 4 and comparisons *within* a cohort, where already available.

Respondent's migration background is defined as being born abroad or having at least one parent or grandparent who was born abroad. Contact's migration background is defined as given in the question text (see Table 2 above).

We further describe respondents' networks using the number of persons indicated, the mean occupational status and the mean share of migrants. For the occupational status, we allocated status values to each of the 13 professions using the International Socio-Economic Index of Occupational Status (ISEI 88). The mean occupational status is calculated as an average over *all* professions, not only over the contacts an individual respondent has. This results in low mean values as not knowing someone with a certain profession contributes an occupational status value of zero to the calculation. In consequence, the measurement captures both the extensity of a person's network, as knowing a member of a profession will always increase the indicator, and the network's status composition, as professions with a higher occupational status lead to a higher increase. Engineer, social worker, doctor, legal practitioner, translator and teacher are positions with an occupational status above the average of 57 points of all professions in the NEPS position generator. Nurse, transport worker, sales assistant, police officer, banker, mechanic and optician have an occupational status below the average of all 13 professions.

As nonresponse within the position generator due to "don't know"- or "refused"-replies is very low for all items in the available NEPS studies (with an overall average of 0.25% for all contact-items and 0.36% for all ethnic background items and no outliers), we display the number of valid responses for each item but omitted additional analyses.

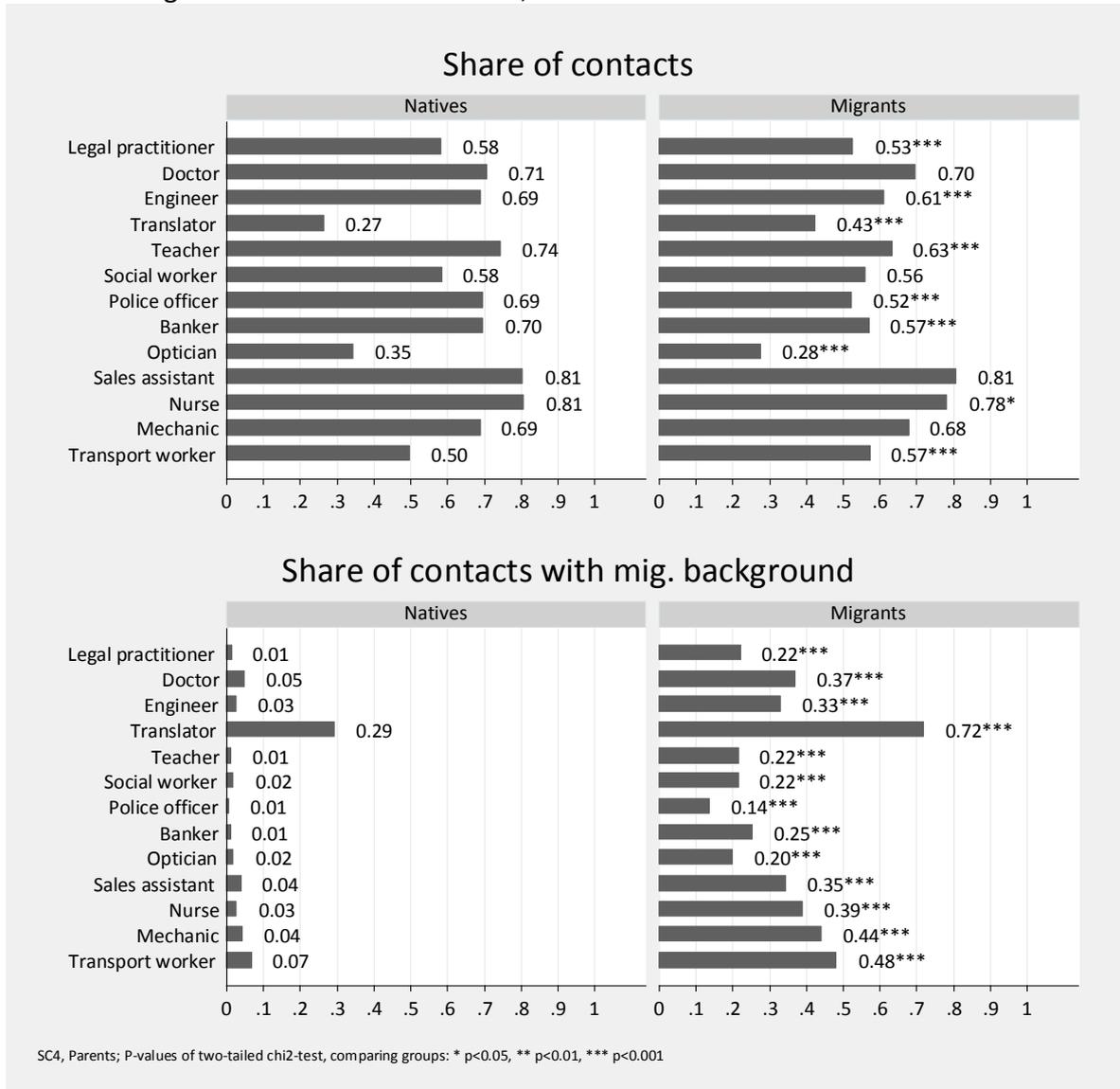
As a last step, we use the information from a first repeated measurement of the position generator in NEPS waves 1 and 5 in cohort 6 (adults) to examine between- and within-variation.

Table 3 displays case numbers and percentages for both parts of the instrument: how many respondents answered that they personally know a person with that profession and if they do, how many of those have a migration background? Contacts differ strongly for the different professions. We also included the ISEI values assigned to the different occupations to allow replication.

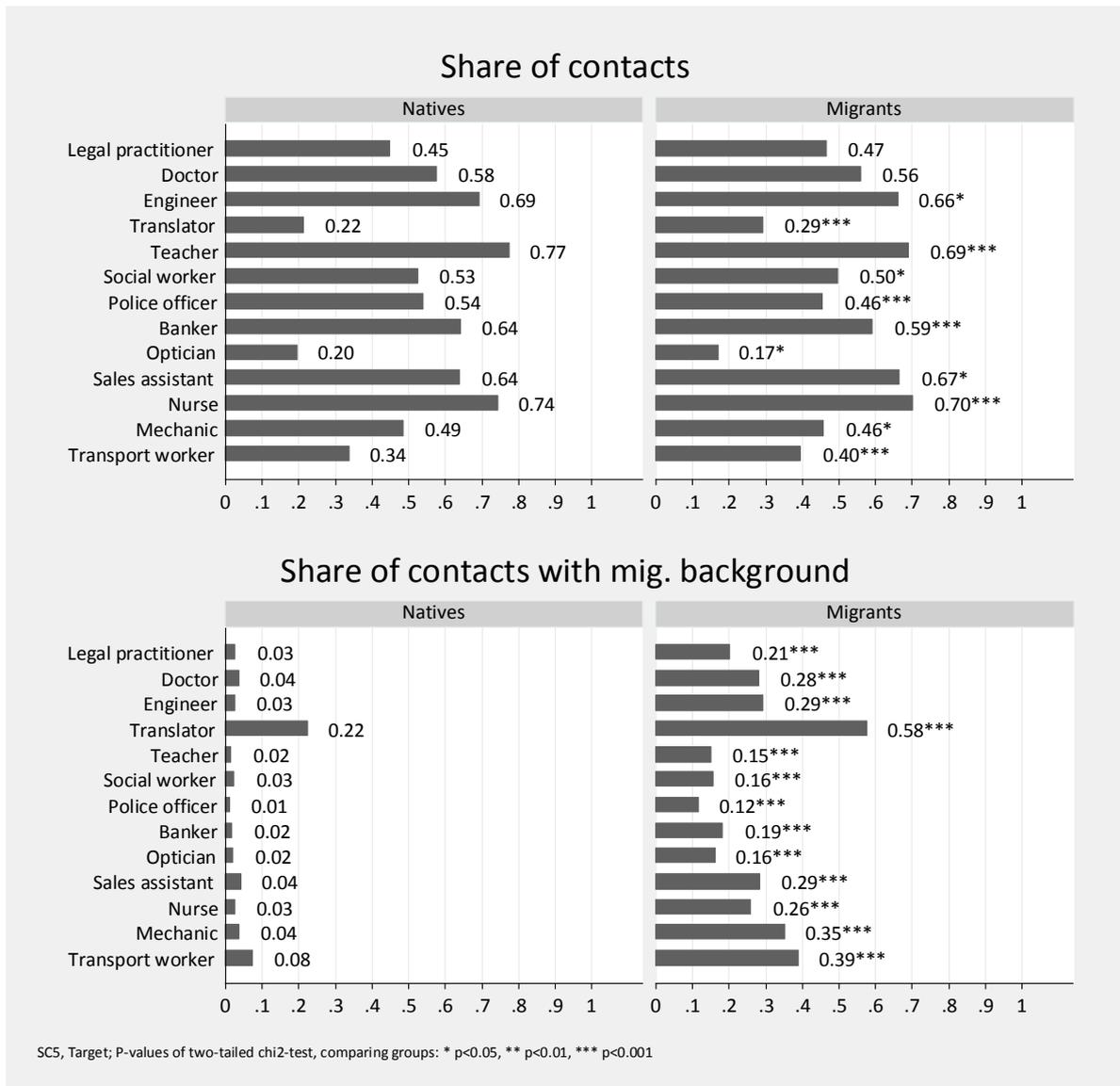
Table 3: Descriptive values for cohorts 2, 4, 5 and 6

profession	ISEI	Parents SC2			Parents SC4			Target SC5			Target SC6, wave 1			Target SC6, wave 5						
		N	%	cont.	N	%	cont.	N	%	cont.	N	%	cont.	N	%	cont.	N	%	cont.	N
Nurse	38	6924	83.67	12.25	9168	80.46	9.81	10664	73.64	6.54	11629	71.33	7.04	10637	78.03	6.35				
Engineer	73	6916	72.19	10.16	9162	67.54	8.15	10655	68.63	7.12	11611	68.24	5.90	10625	75.32	5.36				
Transp. worker	29	6913	47.85	18.70	9147	51.23	15.93	10625	34.75	13.59	11610	45.29	13.25	10625	50.28	13.24				
Social worker	65	6920	62.95	7.54	9152	57.98	5.83	10648	52.10	4.77	11612	48.94	4.61	10622	56.33	4.69				
Sales assistant	43	6918	77.97	13.23	9157	80.74	9.93	10648	64.59	8.44	11612	69.36	8.36	10631	74.12	8.70				
Police officer	56	6923	63.11	4.33	9161	66.05	2.70	10635	52.80	2.79	11612	57.28	1.69	10634	64.62	2.15				
Doctor	80	6922	73.13	12.50	9160	70.75	11.29	10629	57.47	7.69	11619	64.39	7.41	10634	70.96	8.48				
Banker	56	6923	68.16	7.40	9160	67.31	5.21	10637	63.49	4.69	11618	63.52	3.43	10634	67.34	3.55				
Mechanic	34	6918	61.48	16.49	9162	68.66	12.08	10625	48.27	8.81	11612	62.66	9.70	10628	65.44	9.34				
Legal pract.	85	6924	60.96	7.77	9161	57.18	5.09	10636	45.43	5.94	11617	53.65	3.56	10633	58.89	3.47				
Optician	48	6923	28.27	7.72	9163	33.21	5.01	10592	19.17	4.41	11611	27.77	3.26	10633	31.42	3.30				
Translator	68	6923	31.56	47.84	9165	29.72	41.45	10545	22.87	29.89	11619	24.80	36.28	10636	27.21	36.95				
Teacher	66	6923	76.83	6.21	9167	72.19	4.74	10655	76.07	3.80	11617	68.34	3.09	10636	72.36	3.34				
Average	57	6926	62.16	13.24	9160	61.77	10.56	10630	52.25	8.35	11615	55.81	8.28	10631	60.95	8.38				

Exemplarily, Figure 2 displays the average number of contacts with the given professions for natives and migrants in cohort 2. Migrants differ significantly in how often they personally know someone for all professions except sales assistant. The share of contacts with a migration background is substantially larger among immigrants than among natives—for almost all professions. While not surprising, translator is an exception as it is the only profession for which a substantial number of natives’ contacts has a migration background. Detailed figures for cohort 4, 5 and 6 can be found in



Figure



Figure

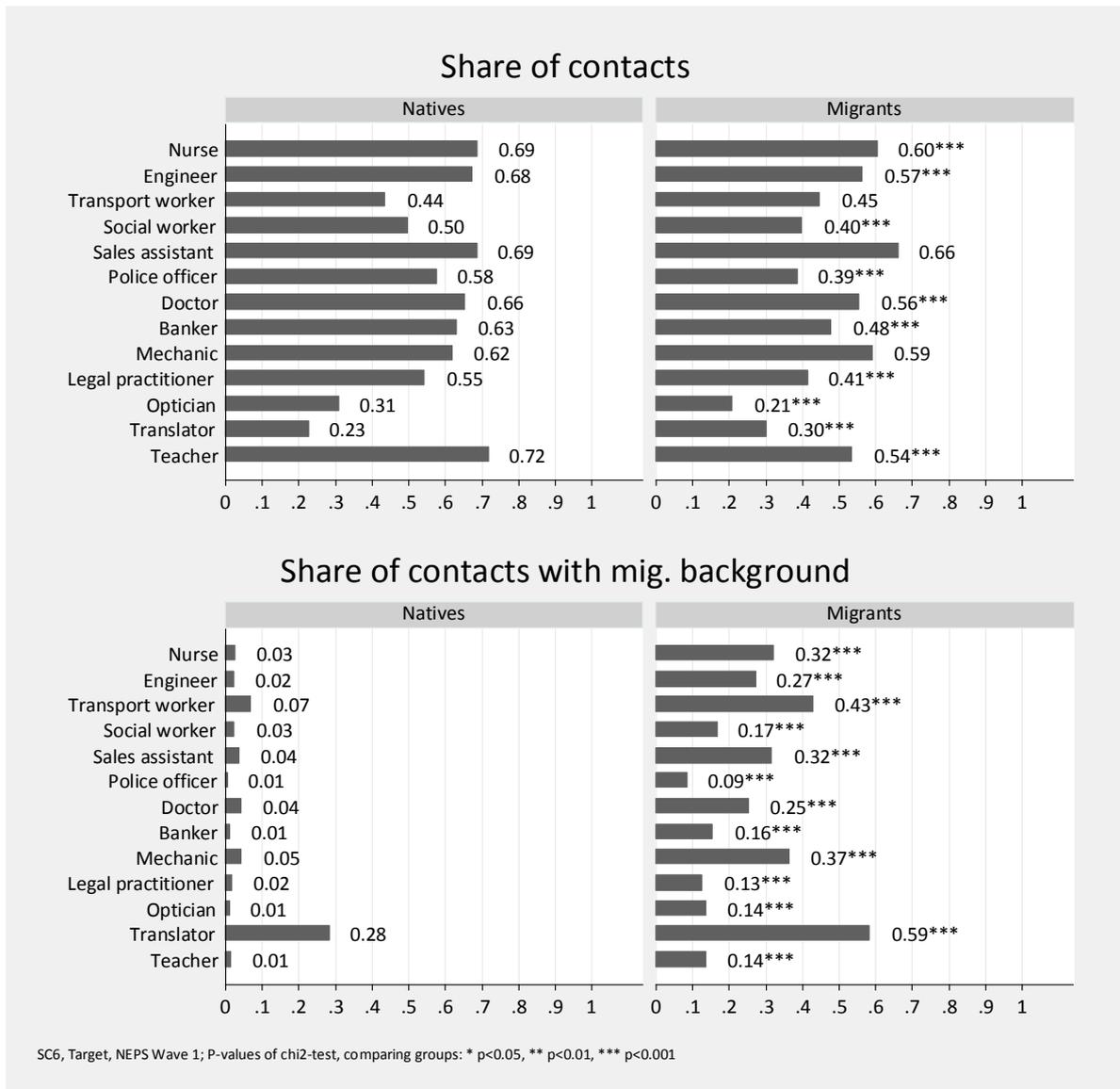


Figure 7 and

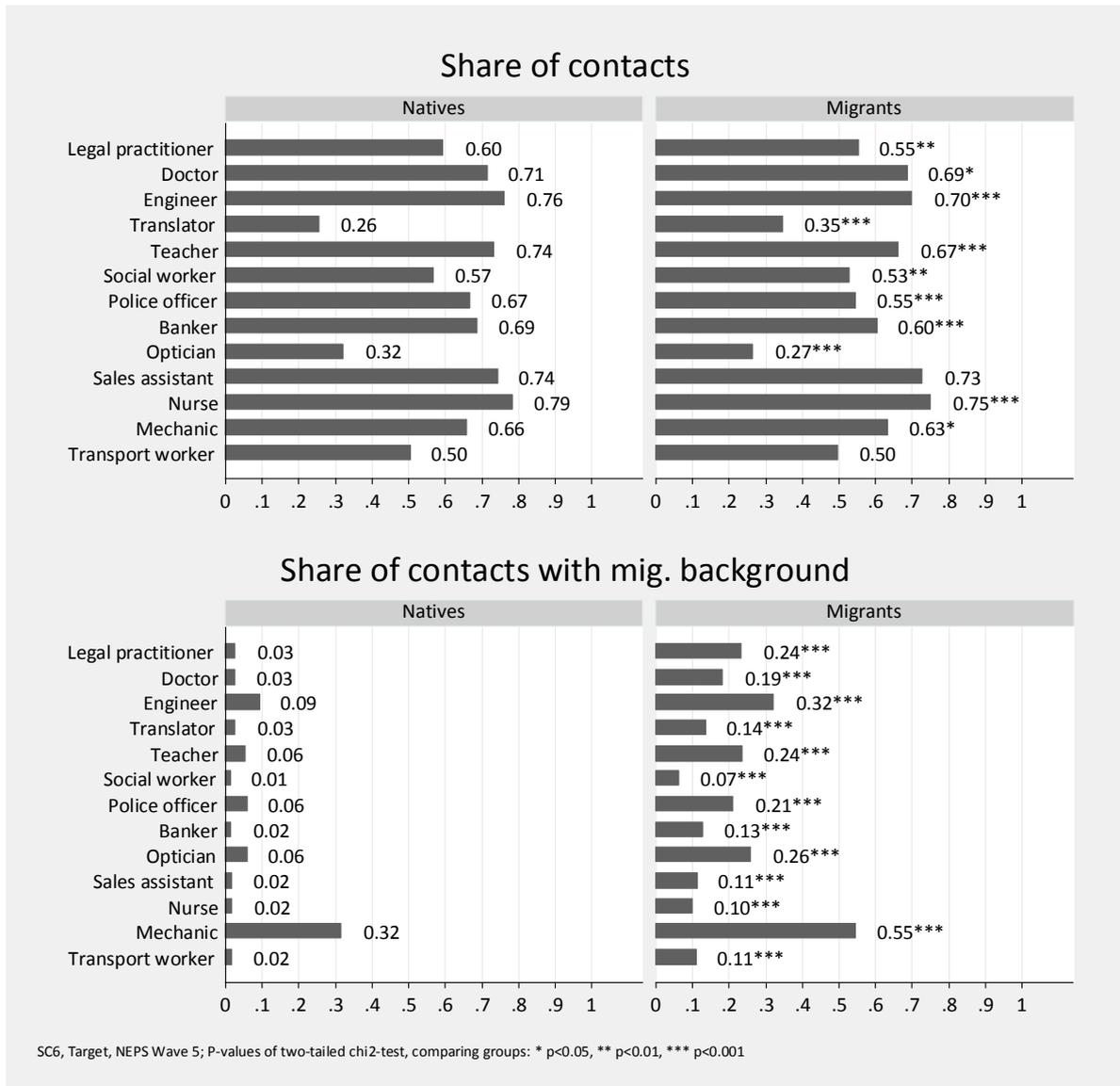


Figure 8 in the appendix.

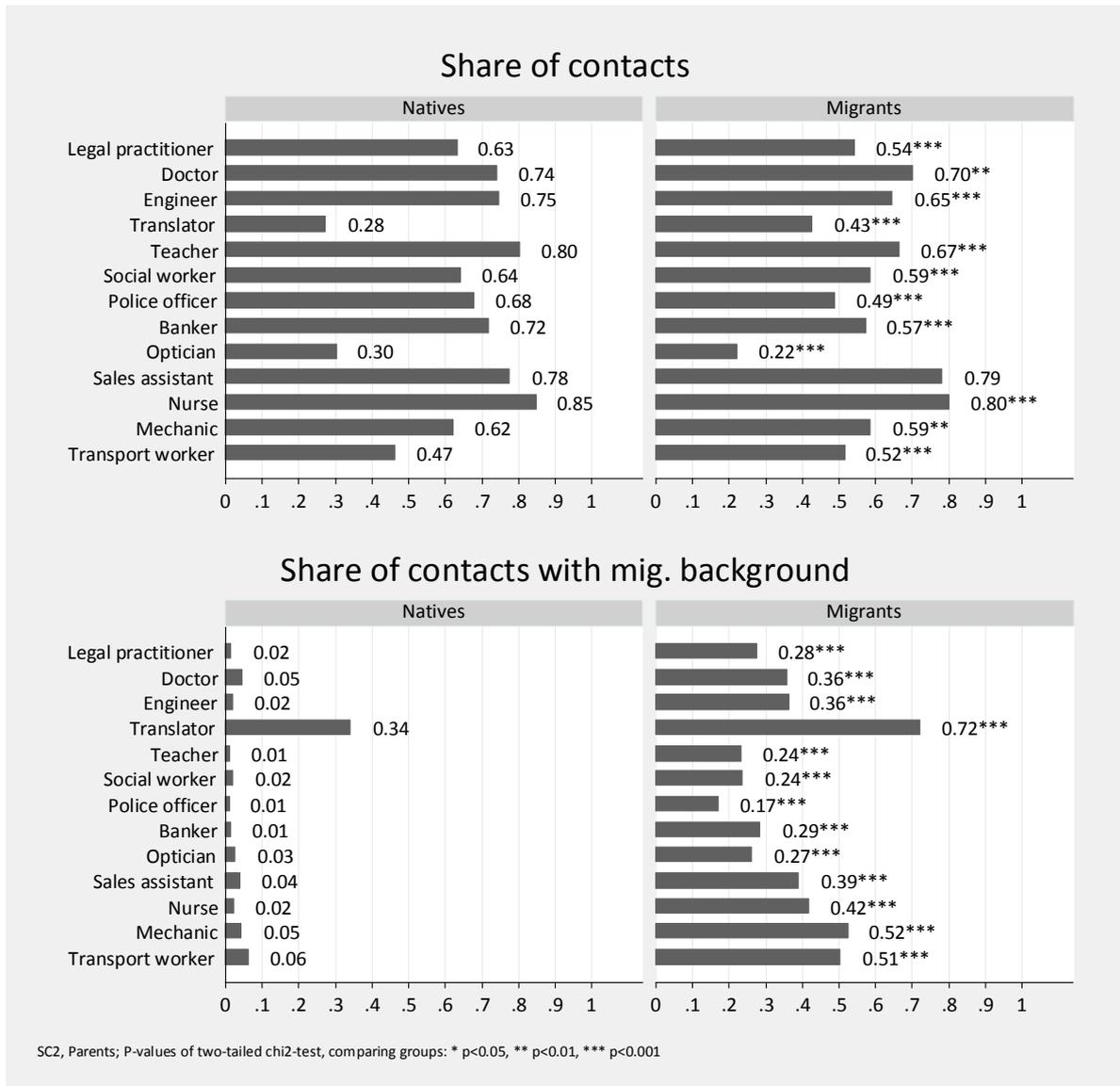


Figure 2: SC2, comparing natives and migrants

Table 4 displays summary statistics for all cohorts. With a range of 6.58 to 7.67 contacts, migrants have significantly fewer contacts than natives in each cohort (6.79 to 8.26 contacts). Their contacts also have a significantly lower mean occupational prestige with a range of 28.72 to 33.21 points (compared to 30.035 to 36.52 points for natives). Most striking is the difference in the average share of contacts with a migration background. While natives only have a 3-4% share of contacts who are not from Germany among all occupations, numbers for migrants are multiple times higher with range from 22% to 38%. Unsurprisingly, we observe the smallest differences in the mean ISEI and the number of persons indicated for academic students (cohort 5).

Figure 3 illustrates the relationship between respondent's own occupational prestige (if they are employed) and their contact's average occupational prestige for cohorts 2 and 4. Figure 4 displays the corresponding relationship for both waves in cohort 6. As theory suggests, we see a positive relationship, both for Natives and Migrants and over cohorts. As cohort 5 is based on a sample of academic students, showing the relationship between respondent's own occupational prestige and the average prestige of their networks is less insightful and we therefore omitted a graph for this cohort.

Table 4: Summary Statistics for cohorts 2, 4, 5 and 6

	Parents SC2		Parents SC4		Target SC5		Target SC6, wave 1		Target SC6, wave 5		
	Average	N valid	Average	N valid	Average	N valid	Average	N valid	Average	N valid	
Number of persons indicated	Natives	8.26	5134	8.11	7359	6.79	8919	7.40	9405	8.00	8774
	Migrants	7.55***	1792	7.67***	1811	6.58**	1784	6.60***	2225	7.50***	1806
	Total	8.08	6926	8.02	9170	6.75	10703	7.25	11630	7.95	10580
Contact's Mean ISEI	Natives	36.52	5134	35.36	7359	30.35	8919	32.50	9405	35.15	8774
	Migrants	33.13***	1774	33.21***	1811	29.46**	336	28.72***	2225	32.99***	1806
	Total	35.64	6926	34.94	9170	30.20	10703	31.78	11630	34.78	10580
Mean share of migrants	Natives	0.04	5126	0.04	7267	0.03	8815	0.03	9303	0.04	8712
	Migrants	0.38***	1792	0.36***	1783	0.26***	1750	0.27***	2166	0.22***	1790
	Total	0.13	6920	0.10	9050	0.07	10565	0.08	11469	0.07	10502
P-values of two-tailed t-test, comparing values between Natives and Migrants: * p<0.05, ** p<0.01, *** p<0.001											

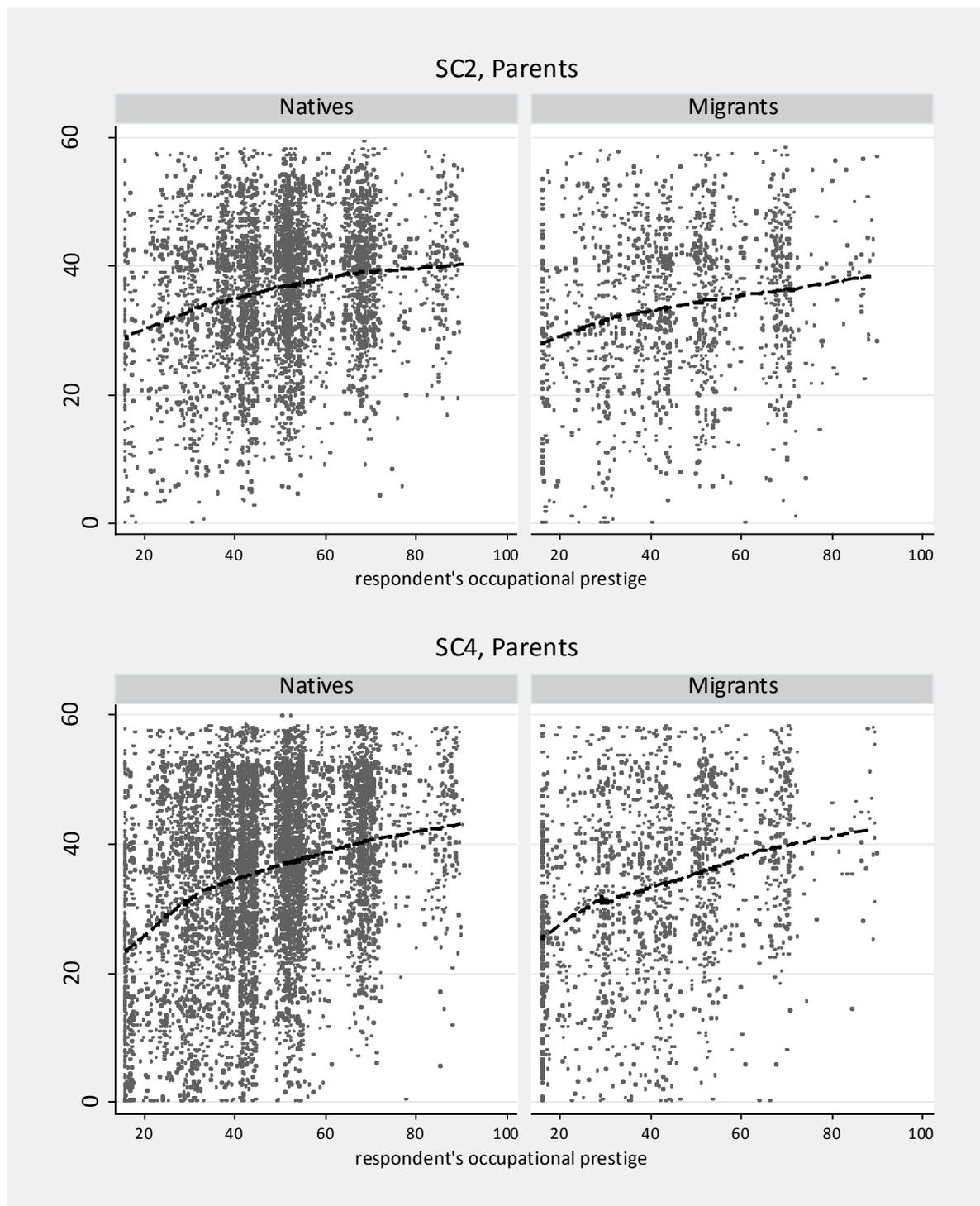


Figure 3: SC2 and SC3, metric relationship between respondent's own occupation prestige (ISEI) and the average occupational prestige of their contacts. Jittered display of data points; lowess based on a locally weighted regression.

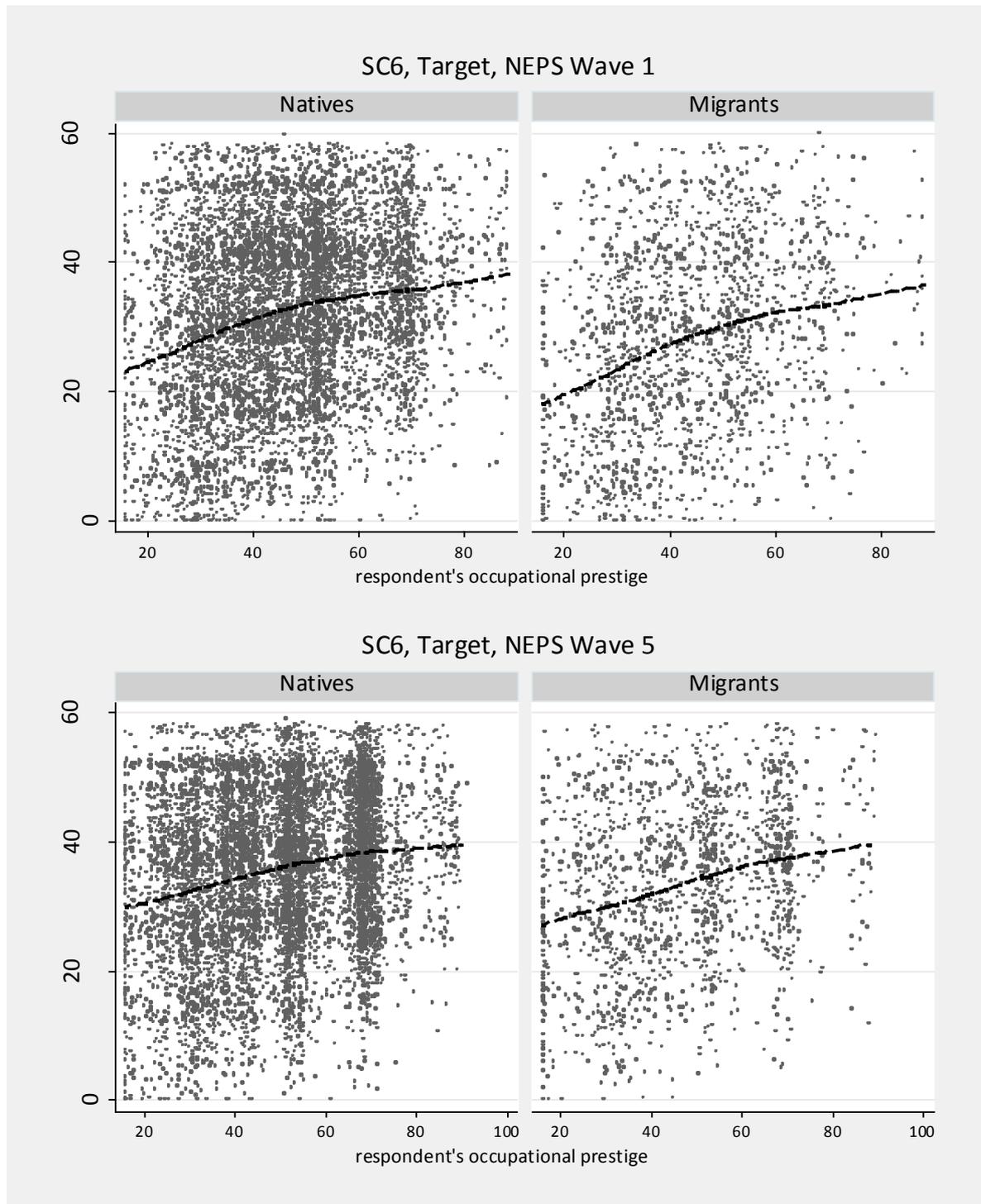


Figure 4: SC6, NEPS wave 1 and 5, metric relationship between respondent's own occupation prestige (ISEI) and the average occupational prestige of their contacts. Jittered display of data points; lowess based on a locally weighted regression.

Finally, Table 5 displays the length of the position generator module for the different surveys. The duration varies between 127 and 133 seconds in computer assisted telephone (CATI) or computer assisted personal interviews (CAPI) but was considerably shorter in the online survey (CAWI) for academic students.

Table 5: Length of modules

	Mode	average duration in seconds
SC2	CATI	131.20
SC4	CATI	na
S5	CAWI	84.00
SC6, NEPS wave 1	CATI/CAPI	125.64
SC6, NEPS wave 5	CATI/CAPI	132.90

Values based on NEPS-internal time stamps. Analyses limited to time values >0 and below the 99% percentile to exclude outliers, e.g. when an interview was interrupted/paused for a long time during the module. Data on duration in SC4 are currently not available, seemingly due to programming issues in time stamps.

Data sources: NEPS studies B13, B56, B70, B72.

Having a repeated measure in SC6 in NEPS wave 1 (2009/2010) and NEPS wave 5 (2013/2014) allows us to differentiate variation *between* individuals and variation *within* individuals over a time period of 3 to 4 years. The following analyses are limited to cases with an observation at both waves (7251 respondents).

We expect social contacts and their ethnicity to vary both between individuals and within individuals, i.e. over time.

Table 6 displays between-individual and within-individual variation for naming a social contact. Results show that between-variation is higher than within-variation for all professions. This is in line with our expectations, as group differences are an important factor in explaining differences in educational and labor market outcomes. We also observe within-variation for all items, making the instrument suitable for panel analyses to estimate the causal effect of social capital.

Table 6: SC6, comparing NEPS wave 1 and 5 - variances

profession	contacts				contacts with migration background			
	Mean overall	Std. overall	Std. between	Std. within	Mean overall	Std. overall	Std. between	Std. within
Nurse	0.76	0.43	0.36	0.23	0.06	0.24	0.22	0.10
Engineer	0.74	0.44	0.38	0.22	0.05	0.22	0.21	0.10
Transp. worker	0.48	0.50	0.42	0.27	0.13	0.33	0.31	0.14
Social worker	0.54	0.50	0.43	0.26	0.04	0.20	0.19	0.10
Sales assistant	0.72	0.45	0.37	0.25	0.08	0.27	0.25	0.13
Police officer	0.62	0.49	0.42	0.24	0.02	0.14	0.13	0.07
Doctor	0.69	0.46	0.40	0.23	0.08	0.26	0.24	0.12
Banker	0.67	0.47	0.41	0.24	0.03	0.18	0.16	0.08
Mechanic	0.64	0.48	0.41	0.25	0.09	0.28	0.26	0.12
Legal pract.	0.58	0.49	0.43	0.23	0.03	0.17	0.16	0.08
Optician	0.30	0.46	0.40	0.23	0.03	0.17	0.17	0.06
Translator	0.27	0.44	0.39	0.22	0.36	0.48	0.46	0.16
Teacher	0.72	0.45	0.38	0.24	0.03	0.17	0.16	0.08

To find out whether changes between NEPS waves 1 and 5 are changes in respondents' answers or due to panel mortality, we re-calculated the summary statistics for wave 1 with only those individuals who also participated in wave 5. Results are displayed in Table 7. While these numbers are indeed closer to the values in wave 5 than wave 1, we still see differences. Significance tests are here applied to differences between waves (not between natives and migrants as above).

Table 7: SC6, NEPS wave 1, summary statistics for subsample of respondents in both waves

		Natives		Migrants		Total	
		Average	N valid	Average	N valid	Average	N valid
Number of persons indicated	w1	7.53	6032	6.98	1217	7.44	7249
	w5	8.09***		7.54***		8.00***	
Mean ISEI	w1	33.17	6032	30.65	1217	32.74	7249
	w5	35.63***		33.20***		35.22***	
Mean share of migrants	w1	0.03	5951	0.22	1187	0.07	7174
	w5	0.04***		0.22		0.07***	

P-values of two-tailed t-test, comparing values between wave 1 and 5: * p<0.05, ** p<0.01, *** p<0.001

Table 8 displays transition probabilities for not having a contact in wave 1 and having a contact in wave 5. Overall, respondents are more likely to expand their social network over time. Taking “Nurse” as an example, respondents have a probability of 48.35% to have such a contact if they did not have one before and a probability of 10.29% of “losing” such a contact after the four years between both waves. Overall, respondents’ networks are increasing, as respondents expand their networks with an increase in age. Fixed Effects estimators (not reported here) support this conclusion. The number of network contacts and contacts’ occupational prestige become significantly larger as respondents get older.

Table 8: SC6, comparing NEPS wave 1 and 5 - transition probabilities

profession	contacts	
	transit. prob	transit. prob
	no->yes	yes->no
Nurse	48.35	10.29
Engineer	41.60	9.64
Transp. worker	30.34	25.91
Social worker	32.65	20.00
Sales assistant	49.41	15.26
Police officer	36.14	13.57
Doctor	41.31	11.88
Banker	36.25	14.97
Mechanic	36.25	17.35
Legal pract.	29.65	15.92
Optician	16.75	30.48
Translator	14.66	33.63
Teacher	42.35	13.99
Average	35.05	17.91

5. Summary and Outlook

In this paper, we outlined the general concept of the position generator and the underlying social capital theory that forms the basis of the instrument. We also described the NEPS position generator and analyzed all NEPS waves available as Scientific Use Files at present. The NEPS position generator is intended to measure respondents’ social resources by giving a range of 13 professions and asking respondents whether they personally know someone who pursues this profession in Germany and if so, about the ethnic background of this person.

Despite having different sample compositions over the cohorts and waves, results for the NEPS position generator are consistent. Nonresponse is remarkably low for all cohorts and

we have no reason to assume that respondents have problems understanding or answering the questions. Based on the analyses, we are confident that the position generator is well suited to capture differences in respondents' social capital resources and to examine inter-group differences. We consistently found meaningful differences between natives and migrants in the number of contacts, their contacts' mean occupational status and their network's ethnic composition. We also found a consistent relationship between respondents' own occupational status and their network's status composition. Longitudinal analyses showed that respondents' networks change over time, with a slight increase with age for the adult cohort.

The position generator's main strength is that it provides a powerful and widely applicable measurement of network composition that is well-grounded in social capital theory. The underlying theoretical assumption is that the resources accessible through a social tie differ systematically according to its position in the socio-economic hierarchy, and that the total volume of an actor's social capital can be assessed through the three dimensions of heterogeneity, extensity, and upper reachability. The position generator thus provides a way to operationalize these three dimensions in a cost-effective, reliable manner. Furthermore, it is a highly flexible instrument. Depending on the underlying research question, various indices can be constructed from the measurement (cf. Verhaeghe & Li, 2015; Lin et al., 2001; Van der Gaag & Snijders, 2005). While this paper focused mostly on the mean ISEI of the network, it would also be possible to focus on the highest ISEI as a measure of upper reachability, or on the number of known positions to capture extensity. Likewise, although the NEPS position generator has been designed on the basis of ISEI scores, it is possible to use other measures of social status—this choice depends on respective research questions. The inclusion of information on social ties' migration background further expands the space of possible operationalizations and its value for research on ethnic inequalities and immigrant integration. Thus, the position generator instrument can be customized to fit a wide variety of research questions.

This generalizability comes with two shortcomings. Both of them stem from the fact that the position generator is an indirect measurement of potential access to social resources. Thus, it cannot assess actual resource mobilization, and it does not help specify the proposed mechanisms through which social capital affects educational outcomes. This is why, within the NEPS, the position generator is embedded in a larger social capital module that also includes more direct measures of social capital, such as a prospective and retrospective resource generator and items on reference group effects (cf. Hoenig et al., 2016). These provide more direct insights into specific social capital mechanisms, but lack the position generator's broad scope and flexibility.

The advantages of the position generator have been widely recognized in the field of labor market research, where it is regularly employed (cf. Lin & Erickson, 2008; Verhaeghe & Li, 2015). In the context of education, however, studies that use position generators are scarce. Thus, the NEPS data offer intriguing new research possibilities for education researchers—we hope that this survey paper will help NEPS users to utilize them.

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Appendix

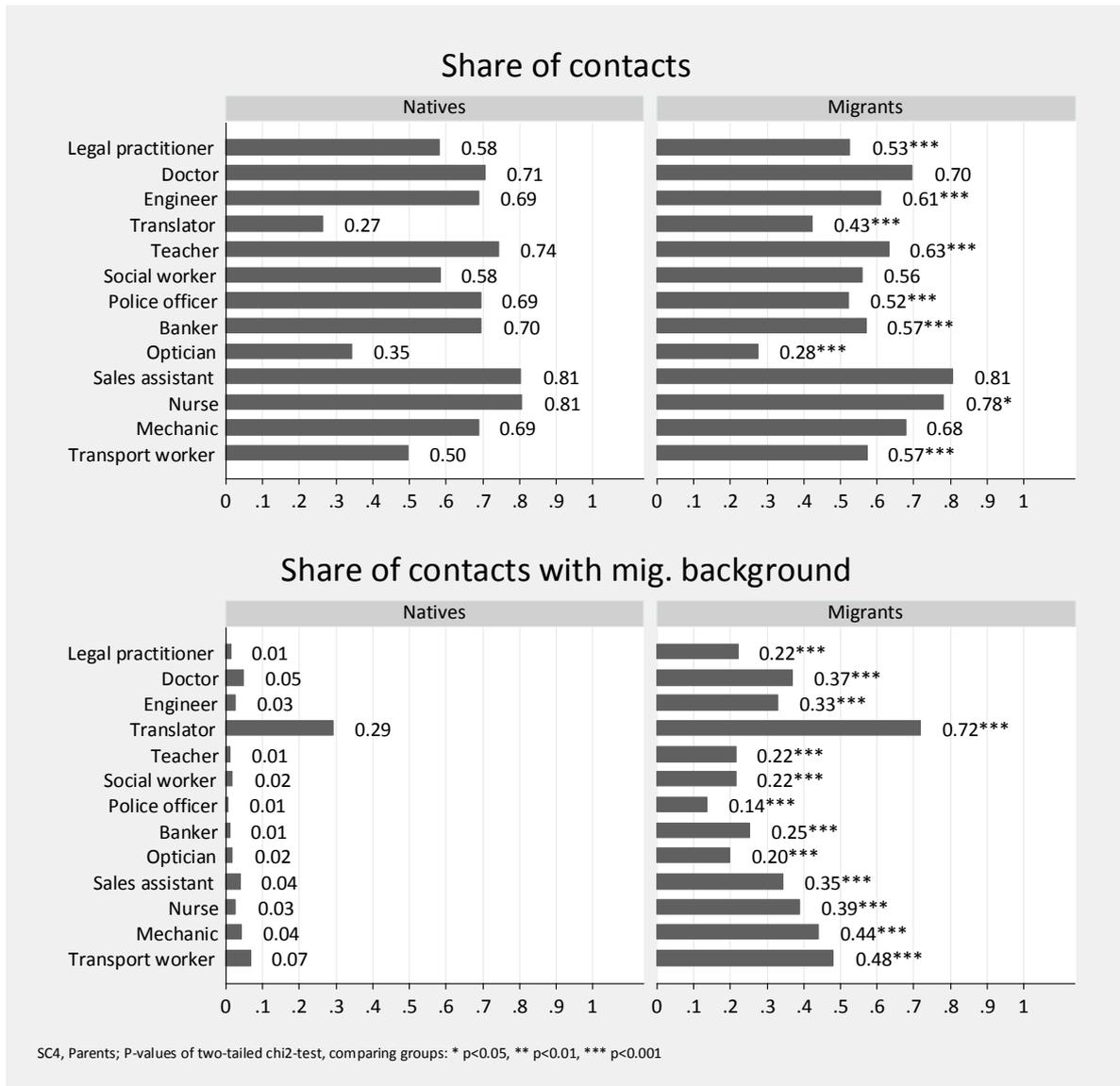


Figure 5: SC4, comparing natives and migrants

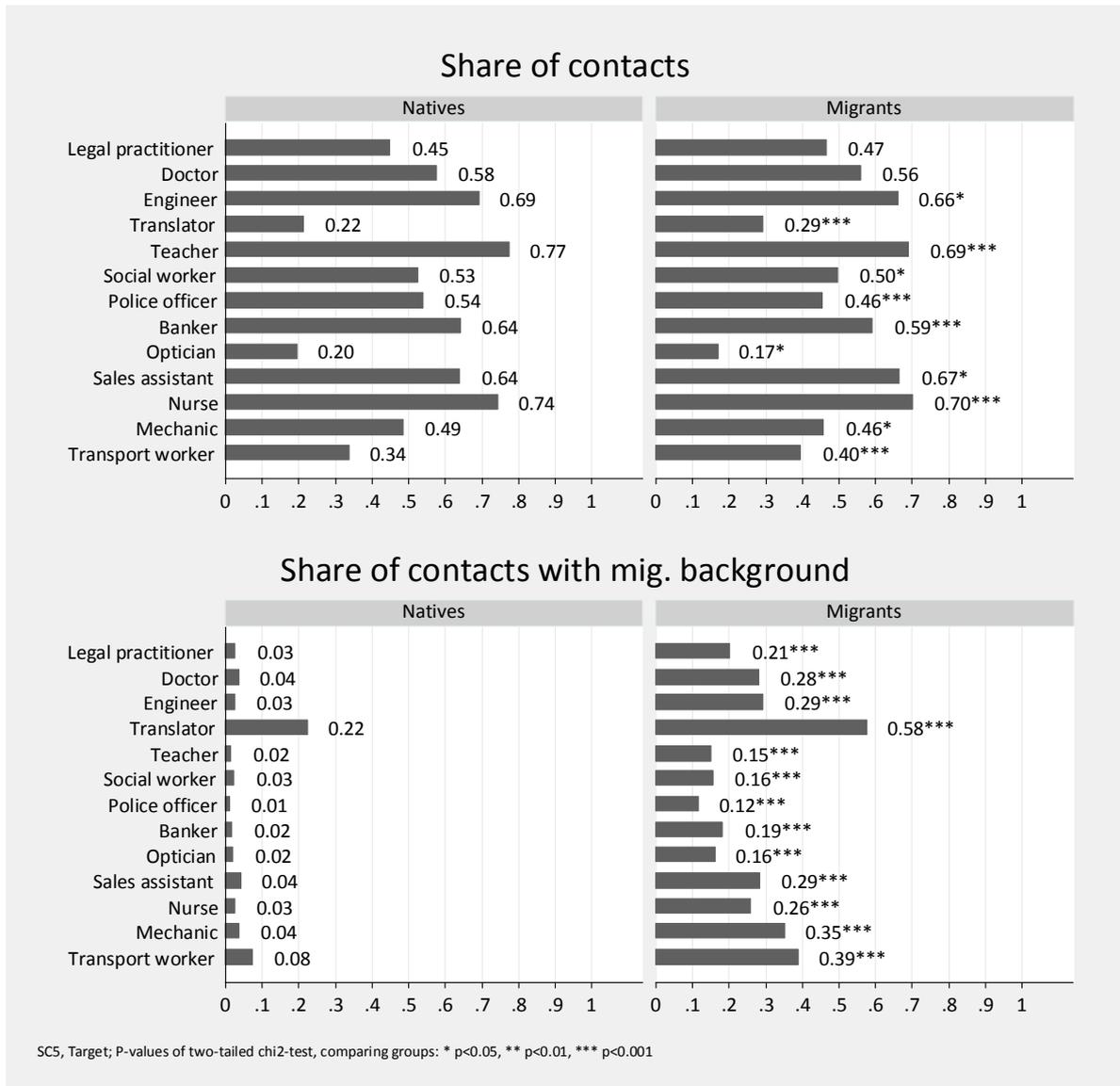


Figure 6: SC5, comparing natives and migrants

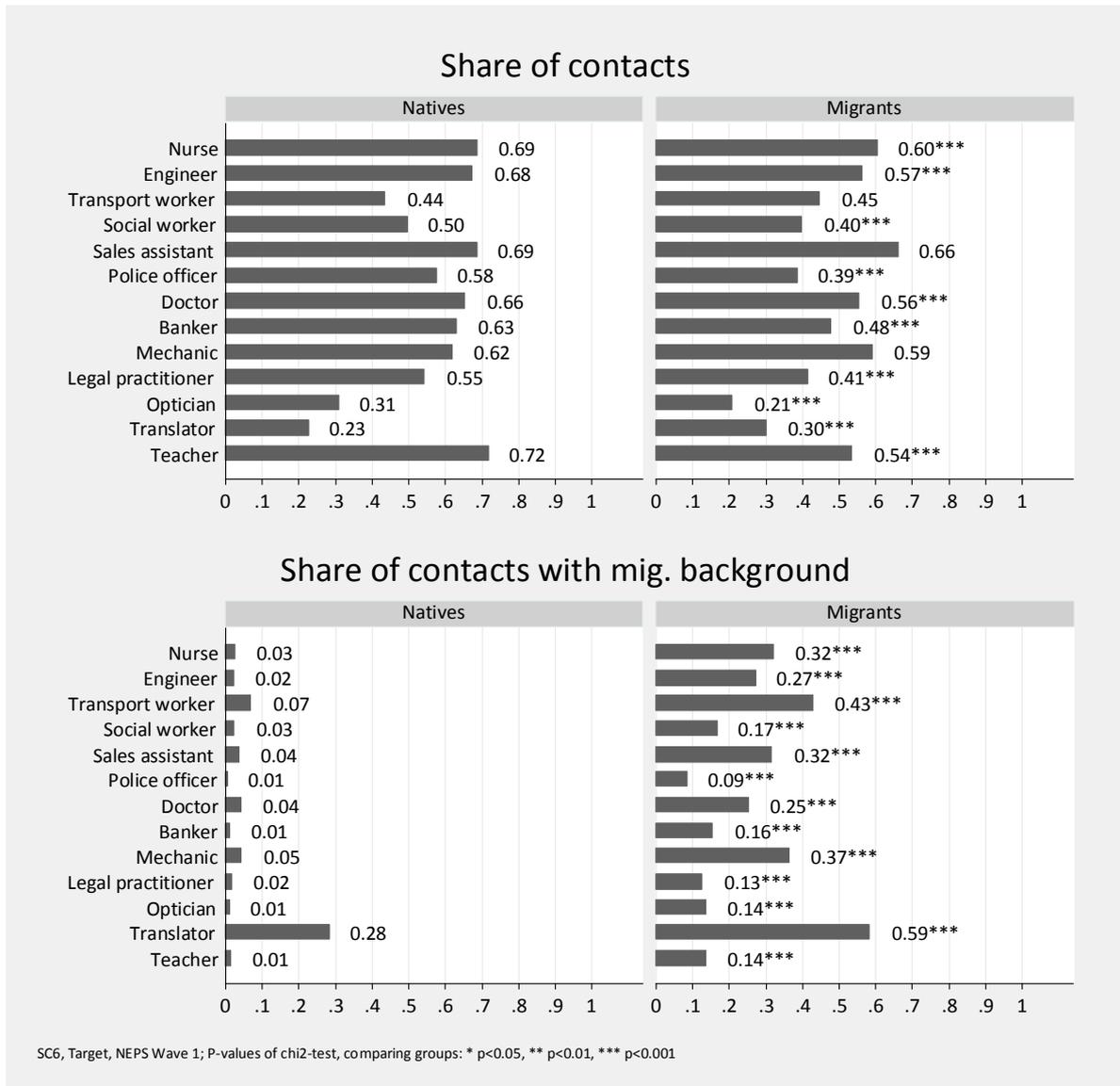


Figure 7: SC6, NEPS wave 1, comparing natives and migrants

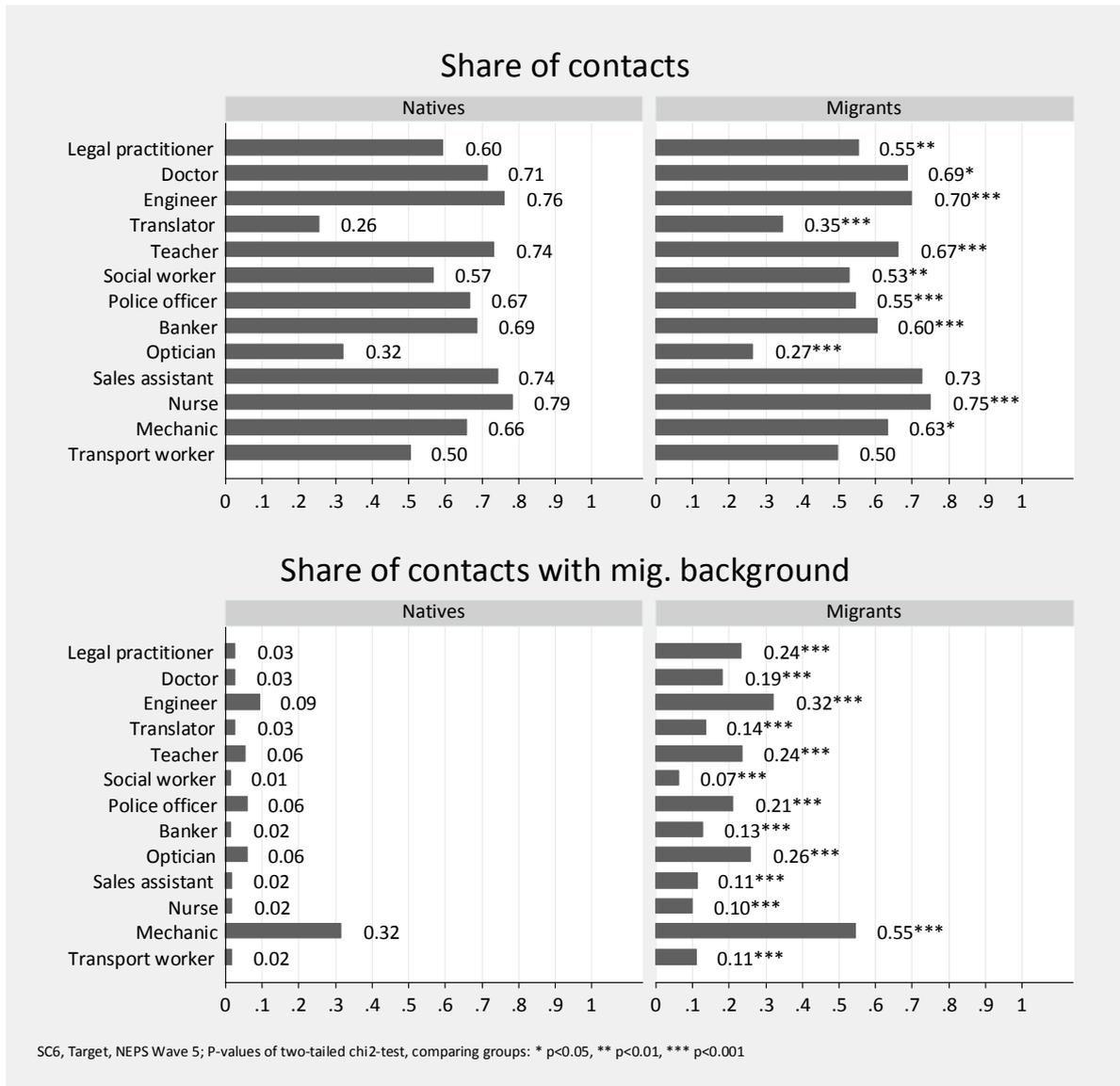


Figure 8: SC6, NEPS wave 5, comparing natives and migrants