Ambiguities in responses to the Position Generator

"Friends are important because you have the same interests. Not because of what they *do* at work".

– a respondent

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Abstract

The Position Generator is a popular measurement instrument for individual level social capital (Nan Lin & Dumin, 1986; Nan Lin, Yang-Chi Fu, & R.-M. Hsung, 2001). Empirical studies have tested or discussed measurement properties of the instrument, but not the underlying response process. In 35 semi-structured cognitive interviews across gender, education, and age groups, we asked respondents to reflect on the 1999/2000 Social Survey of the Dutch (SSND) Position Generator. Effects found were unfamiliarity with occupations, interpretation of occupations, unknown occupations of alters, forcing alters into occupations, speculation, forgetting single alters and groups of alters, but not detectable misrepresentation of alters. In only 6 interviews all alters were working in a paid job (as the PG assumes); most remarkable alternatives were retired, unemployed, or deceased alters. An overall impression of the responses is that recalling alters to fit occupations feels counterintuitive to how relationships are memorized. Item validity and reliability are therefore likely to be negatively affected, but whether all combined ambiguities affect social capital measures is difficult to predict. Yet, an underestimation of social capital seems likely. Implications and ideas for future development of PGs are discussed.

Keywords: measurement; individual level social capital; position generator; validity; item reliability; survey response models; cognitive methods

Introduction

Quantitative measurement of individual level social capital, seen as resources embedded in individual social networks, has so far proceeded using two main types of data collection techniques. *Name generator* methods start with the composition of a list of individually identified network members, which is then used for further data collection about these network members' attributes (among which their resources), their mutual interrelationships, and their relationship to ego - the focal interviewee. The method may involve free recall from memory, or selecting alters from an external list (Marin & Hampton, 2007; Marsden, 1990). These methods can result in rich data, but are often time-consuming. In addition, the freedom to include questions, and the wealth of possibilities to express data into social capital measures can also lead to incomparability (van der Gaag, 2005:ch.5).

Two other methods, the *Resource Generator* (van der Gaag & Snijders, 2005) and the *Position Generator* (Lin & Dumin, 1986; Lin, Fu, & Hsung, 2001) do not generally identify individuals, but specify 'inventories', about which respondents indicate whether they know someone applicable to each item. In case of the Resource Generator, the items literally represent exchangeable social resources (advice, skills, practical help, support, etc.). In case of the Position Generator, the items represent occupations, from which access to social resource collections is inferred on the basis of socioeconomic indices (see Table 1).[4]

The Position Generator (PG) has become increasingly popular in social capital population studies, as reflected in volumes of studies on status attainment, inequalities of gender, ethnicity, health, and other topics using the instrument (Hsung, Lin, & Breiger, 2009; Lin & Erickson, 2008a). This can be explained by its theoretical elegance, and its ease of adjustment to new populations, enabling a potentially large comparability between social capital studies (van der Gaag, Snijders, & Flap, 2008; van der Gaag & Webber, 2007). In addition, the instrument generally has a low percentage of missing values (B. H. Erickson, 2004a; Lin & Erickson, 2008b; van der Gaag, 2005), even when included at the end of a long web survey (Marlow, 2005:117-8). Although the PG aims to be "content free" (Lin et al., 2001), and elicits network ties of various strength (Fu, 2008), its design, and especially some of the resulting indicators, do seem to put more emphasis on resources useful in instrumental actions rather than expressive actions (van der Gaag et al., 2008).

Although good descriptions of the construction process and inferences about data quality are available (B. H. Erickson, 2004a; Lin & Erickson, 2008b), as well as valuable work about the representation of network members in its responses (Fu, 2008), little has been said about the response process. With this contribution, we aim to elaborate on how respondents understand and handle PG questions, and how these may affect social capital data.

Construction and application

A PG typically consists of a stem question, a list of occupations, and an answer format defining how the items should be responded to (Table 1). The *stem question* comprises an introductory text, asks the

[4] The overall interpretation of PG items varies. Their primary use is to provide an indication about the respondents' reach into societal status structure. However, it is also possible to see occupations in the PG as *inherently* useful social capital (like a single item in the Resource Generator), and to suggest that knowing someone in each of the particular occupations each has distinct, beneficial social capital effects (e.g. it is good to know a cook for his specific resources). Although PG items such as 'knowing a member of parliament' (Webber, 2008) directly suggest this interpretation, this is beyond their meaning in this contribution - but an interesting suggestion for predictive analyses in its own right.

respondent to indicate whether s/he knows anyone in each occupation on the list, and usually defines what should be considered 'knowing' someone. The *list of occupations* is a set of typically 10-30 items (Bartelski, 2010) including the names of occupations represented on rows of a response matrix. Higher numbers of occupations are better to detect the representation of social resources across society. The occupations should be selected to cover all classes or the entire range of occupational prestige in the society they represent, and cover most sectors of the economy. Careful selection of occupations should take care they are widely recognized, clearly bounded, and represent enough incumbents, so that respondents have a fair chance of knowing someone in them. In addition, using the same names for occupations as on census lists enables better inferences from data (B. Erickson, 2008; B. H. Erickson, 2004a; Lin & Erickson, 2008b). The *answer format* for each item usually asks the respondent whether someone is known in this occupation at all, and if so, whether this person is a 'family member', a 'friend', or an 'acquaintance'. Variations include dichotomization (yes/no; De Graaf, Kalmijn, Kraaykamp, & Monden, 2010), or specification of knowing a man and/or a woman in an occupation (B. Erickson, 2008; B. H. Erickson, 2004b; Lin & Erickson, 2008b; Miyata, Ikeda, & Kobayashi, 2008).

Measures

Typical measures calculated from PG data are the *number of accessed occupations*, the *highest prestige of accessed occupations*, and the *range in prestige of accessed occupations* (Lin et al., 2001; van der Gaag et al., 2008). Alternatives include the *average prestige of accessed occupations* and the *total prestige of all accessed occupations*, the construction of population-specific subscales by latent trait analysis (Angelusz & Tardos, 2008; van der Gaag et al., 2008), the deconstruction of occupational prestige scores into separate scales for economic and cultural social capital (Flap & Volker, 2008), and measures for occupations in separate class strata (Cote & Erickson, 2009; Verhaeghe, van de Putte, & Roose, n.d.). For the construction of many measures separate index values are needed for the occupations. Most popular is the Standard Occupational Prestige Scale (SIOPS) (Treiman, 1977), but in Dutch research Sixma and Ultee's 1992 measures for occupational prestige (Bakker, Sieben, Nieuwbeerta, & Ganzeboom, 1997), and the International Socio-Economic Index of occupational status (ISEI) (Ganzeboom, De Graaf, & Treiman, 1992) have also been used.

Ambiguities anticipated in PG responses

In order to collect good quality survey data, respondents need to have a similar and consistent understanding of the questions. We investigate these properties for the PG using the cognitive model of Tourangeau, Rips, & Rasinski (2000), distinguishing four stages in item response: *comprehension*, involving the identification of information sought by the researcher; *retrieval,* recalling relevant information from memory; *judgment*, where the retrieved information is evaluated and combined into a response; and the *response* phase, where the answer to the question is provided as well as the survey format allows (Tourangeau, Rips, & Rasinski, 2000).[5] Although our research is essentially explorative, we formulate a number of propositions about ambiguities in these stages of the response process, in order to enable explicit reflections on the data by respondents. Our propositions are based on the literature, earlier explorative work (Appelhof, 2011a; Webber, 2008), and ambiguities merely hypothesized earlier (van der Gaag & Webber, 2007).

[5] For this research, we also collected data on handling the response format 'family','friends', and 'acquaintances'. However, for reasons of space, we do not discuss these findings in this contribution.

Comprehension

The understanding of PG questions is mainly about the specific wording of the occupations. Difficulties can occur when these are *unfamiliar* to the respondent. More specifically worded occupations have been observed to receive lower responses (van der Gaag, 2005:128), probably because they are not very well known in the general population, such as 'academic researcher' or 'laboratory technician' (Martin Paul Webber, 2008:130). Occupations can also be perceived as irrelevant ('taxi driver') or old-fashioned, like 'fishmonger' and 'countryside warden' (Martin Paul Webber, 2008:128). Our first proposition is therefore ***P1****: Respondents may be unfamiliar with the content of an occupation.*

Occupations may also appear as *poorly defined*. British focus group interviews suggested that some occupations are too broad to be included, such as 'community worker', and others could have multiple meanings, such as 'market trader' (Martin Paul Webber, 2008:128-9). 'Leraar' (Dutch for 'teacher') can be interpreted in different contexts (Appelhof, 2011a): as a general indication of an occupation concerned with some form of education, or more specifically within a hierarchy of the educational system illustrated by 'kleuterleidster' (kindergarten supervisor), 'onderwijzer' (primary school teacher), 'leraar' (secondary school teacher), and 'docent' (lecturer, formal denotation of the teaching profession used for higher educational levels). Our second proposition is therefore ***P2****: Respondents may have divergent ideas about the content of an occupation.*

Retrieval

Occupations in the PG trigger respondents to recall alters from memory, a so called 'free recall' procedure in which no external evidence is available (such as a list). Forgetting alters can be a substantial problem in network data collection (Brewer, 2000), and probably also in the PG response process, even when alters have a requested occupation and this is known to the respondent. Although it is difficult to detect this effect, another proposition is therefore ***P3****: Respondents may not recall alters that have the specified occupations*.

Alternatively, respondents may not be familiar with the occupation of their network members. While remembering the occupations of parents seems to go reasonably well (de Vries & Ganzeboom, 2008), early social networks research showed that many people do not seem to know the jobs of their closest friends, and that the accuracy of how alters' occupations are remembered is variable (Laumann, 1969). This leads to a set of propositions starting with ***P4a****: Respondents may not know about their network members' occupations*. Because the closed answer format of the PG explicitly specifies occupations, lack of knowledge can also cause confusion, leading to proposition ***P4b****: Respondents may be in doubt whether an occupation is close enough to an alter's actual occupation*. Because the PG does not state anything about the uniqueness of alters, an additional proposition is ***P4c****: Respondents may link the same alter to multiple occupations*.

Judgment

When alters 'fitting' an occupation are retrieved from memory, interviewees evaluate whether information about them is appropriate. This involves several judgments. First, they establish whether an alter actually 'has' that occupation based on an individual understanding what 'being in an occupation' is. Although this is heavily implied by the general measurement model, the PG stem question "Do you know anyone in the following occupations?" does not always make explicit that alters have to be *working*. Among Dutch students of intermediary level vocational education (MBO) the word 'beroep' (occupation) seemed prone to different interpretations. Besides alters in paid jobs, interviewees also specified alters who do voluntary work, who are still in education, who are retired, or who perform an activity similar to

an occupation as a hobby (Appelhof, 2011a). Our next proposition is therefore ***P5****: Respondents may differ in their judgment about when someone is in an occupation.*

A second judgment is central to any social network survey: when do you 'know' someone? In the PG stem question, interviewees are generally given a definition of this, for example "You do not have to know these people really well, but should know them by name and by sight and well enough to talk to" (B. H. Erickson, 2004a). Its objective is to avoid any responses about people who do not know ego, such as TV personalities (Flap, 2004), or to avoid responses about people in occupations that are not known personally, but merely interacted with professionally such as teachers, doctors, or clergymen (van der Gaag & M. Webber, 2007:39). Our next proposition is therefore ***P6****: Respondents may judge differently when contacts are personally known.*

Finally, respondents may show a tendency to over-report certain occupations, even to the extent of reporting non-existing alters. Real 'false positives' are rare (Brewer, 2000), but forms of *attractiveness bias* may be present: the extent to which people distort their reports about ties to individuals who are generally seen as attractive or unattractive (Feld & Carter, 2002). In the PG, this may induce respondents to over-report more salient items (artists or musicians), powerful occupations (director of a company), or occupations with high prestiges. Our last proposition is therefore ***P7****: Respondents may give more positive responses to salient occupations*

Methods

We explored our propositions by asking a sample of respondents to respond to a PG, and immediately afterwards describe their understanding of the questions in semi-structured, face-to-face interviews using open questions. This procedure, a retrospective protocol, is the closest approximation available to evaluate a person's cognitive understanding of questions (Sudman, Bradburn, & Schwarz, 1996:18-24). The PG selected for this research (Table 1) stems from the first wave of the Social Survey on the Networks of the Dutch (SSND 1999/2000, see Völker & Flap, 2004), a rich multi-wave data source for many Dutch social capital studies. This PG has since served as a model for several new versions.[6]

Table 1 about here

The interviews started with asking for permission to digitally record the conversation (which was granted by all), and a general explanation of the procedure. Next, respondents were asked to fill out a PG with minimal guidance.[7] Different from the usual PG response procedure, we explicitly asked respondents to write down and identify specific people that came to mind following the items, enabling later examination

[6] The SSND PG was originally developed in Dutch, and has been translated into two slightly different English versions, with more emphasis on British (van der Gaag et al., 2008) and American English (Flap & Volker, 2008), respectively. 11 of the 30 positions are differently worded between versions. The latter is presented here. Such within-language variations in translations suggest that international and interlingual comparability may be much less straightforward than is often assumed.

[7] All direct questions for assistance were essentially evaded, advising the respondent to do whatever s/he would think best.

of their response.[8] When necessary, a definition of 'knowing someone' was provided: "when you call this person on the phone, s/he immediately knows who you are, without having to explain anything". Immediately after responding to the PG, a first question simply asked the respondent to reflect on the task. Next, a set of open-ended questions derived from the propositions (made clear in the results section) followed.[9]

All interviews were conducted on locations selected in agreement with the respondents; this included the respondent's home or work quarters, a quiet café or a public library. On most occasions only the interviewer and the respondent were in the same room. Only unknown others were sometimes present, and did not join the same table. Although all questions were asked to all respondents, the specific wording and order were left flexible when the respondent expressed the desire to discuss some topics earlier than officially due. The interview ended with questions about the respondent's occupation, marital status, number of children, postal code, and nationality. The interviews took between 35 and 70 minutes, of which the first 10 – 25 minutes were spent on topics presented in this contribution.[10] After the interview, the recordings were transcribed by the interviewer.

Sample

Since common PG values generally differ for gender and education groups, we aimed for a diversified sample composition with at least six to seven respondents for each cell of a 2*3 design. Initial invitations were sent and passed on to first and second order network members of one of the authors, on the basis of gender and educational (high, medium and low) strata. Given that PG studies are typically about social capital in adult populations, only respondents of 18 years and older were approached. In order to minimize any biases, the interviews were announced as "research about people you know and their occupations".[11] No rewards were offered. In line with sample sizes of previous cognitive studies on social network questions, ranging between 18 and 50 (Bailey & Marsden, 1999:292), eventually 35 interviews were conducted and completed between May and July 2011.

On three occasions the interviewer had met the interviewee before; because these three interviews did not show discourses or topics dissimilar to the other 32, they were included in the analyses. Twenty (57%) of the interviewees were males (Table 3). Fourteen respondents (40%) had primary school or high school as highest completed educational level, nine (26%) had completed medium level education (MBO), and twelve (34%) respondents followed or had completed higher education levels (higher vocational training (HBO) or a university degree). Three respondents were born outside the Netherlands (two in the United States, one in Iraq), but each of them had worked or studied in the

[8] For privacy reasons, the respondents kept their copy with the names. The interviewer copied anonymous item responses simultaneously on his laptop.

[9] A full version of the interview protocol is available from the first author.

[10] Other topics included were perceived differences between network members' roles as family member, friend, and acquaintance, and a module sampling five of the identified alters from different prestige strata, which were subsequently identified in terms of concrete help or resources they might give access to.

[11] This proved to be somewhat over-cautious in terms of response bias. As a typical sociological proxy measurement model, the PG involves quite some explanation to the layman. Yet, we did anticipate low response urgency for those little socially active ("but I hardly know anyone!"), by explicitly not mentioning the study was about "whether you know (m)any people in occupations".

Netherlands for at least a decade and spoke Dutch fluently. The respondents happened to be well distributed over age categories: thirteen respondents (37%) were between 18 and 35 years old, eleven respondents (31%) were between 36 and 55 years old, and another eleven were older than 55, with the oldest respondent aged 73. On average, women were older (47.4) than men (39.0), however.

Results

Respondents knew people in 17.35 (sd 4.24) different occupations on average. Most popular occupations were 'teacher' and 'nurse' (both known by 91%); least popular occupations were 'trade union manager' (17%), 'engine driver' (20%), and 'foreman' (29%).

General remarks to the task

Completing the PG took between three to ten minutes. Immediately afterwards, interviewees were asked "What do you think of this questionnaire?" The answers were coded into four main categories (see Table 2).

Table 2 about here

Impressions mainly related to *feelings* most commonly included the remark that filling out a PG is nice or a nice activity (N=6); furthermore, that the task was easy (3) or, on the contrary, difficult (2). More reflective impressions also tended to be positive: "It's funny. You browse through your Facebook friends" (Interviewee #30); "I never looked at the people I know in this way. It is useful to do, to see whom you have in your network. It's not difficult, although you're used to think of your friends first and of their jobs thereafter, instead of the other way around" (Interviewee #7). Other spontaneous remarks referred to the *occupations* on the list: some were considered old-fashioned (2); the set of jobs was perceived as clear in meaning (1); or that more jobs in the social work sector should have been included (1). Many interviewees (N=14) spontaneously indicated to be troubled by *linking alters to occupations*: they mentioned not to know which jobs (all) people they know are working in (5), difficulties to come up with alters in response to the jobs on the list (4), to know alters in certain occupations, but not being able to remember the right person (3), or that the required thought process was demanding (2). Two remarks were about the *response categories*: that they were uncertain about the label 'acquaintances' (4), or did not know how to classify their colleagues in the format (3).

Comprehension: the content of occupations

The first specific question was "Are there any occupations on the list of which you thought 'I wonder what that actually is'?" If the interviewee mentioned an occupation, the follow-up question was "What do you think this occupation is about?" Ten different occupations were mentioned in response to these questions (Table 3).

Table 3 about here

The occupation most unfamiliar to respondents (N=9) was *foreman* ('ploegbaas'), especially to younger interviewees. "I really had to think about the term foreman. What exactly is a foreman? Mostly, I pictured a foreman as someone who works in shifts in a factory, and provides leadership to the crew during that

shift" (Interviewee #19). Other interpretations were "farmer",[12] "someone working in a bar" (interviewee #19), or "[someone] in a soccer club" (interviewee #22),[13] whereas interviewee #20 admitted "I don't know what a foreman does. I just answered: 'no-one'". *Policy maker* (8) is next. "That doesn't ring a bell to be honest, stupid as it may seem. What is it?" (Interviewee #31). One interviewee of American origin sighed after clarification: "That's really typically Dutch, a meeting professional". Respondents who recognized the occupation could still be in doubt: "Yeah, policy maker is a difficult one. I know people who work for the municipality or for the government, but are they really policy makers? I can't fill that in" (Interviewee #6).

Mechanic is unfamiliar to three interviewees.[14] The *unskilled laborer* sounds as a familiar occupation, but causes trouble for its adjective 'unskilled', across educational levels and age groups. Interviewee #28: "I have a younger brother. He got his lower vocational qualifications after a lot of trouble. He got his qualification papers forced upon him: off with you! Is that what you call unskilled? You haven't made much headway, you haven't developed any particular skills for a specific job. When do you call someone unskilled? You can read and write, that's it". "An unskilled laborer… well… when do we call someone unskilled? You must came straight from the jungle. Do we call someone 'unskilled' who didn't finish his education? In fact, you do have an education, right? Anyone, however poorly educated, has acquired some skills" (Interviewee #16). *Unskilled* also raised objections: "I don't want to give anyone that label, it's so down-putting. You have to get the most out of people nowadays, right?" (Interviewee #18). Interviewee #8 thought "The bottom line is that anyone who hasn't had any relevant education is an unskilled worker".

Information technologist was also confusing (5): "someone working in a factory" (Interviewee #26); "something with a personal computer? In an office?" (Interviewee #12). Other occupations perceived as poorly defined are *higher civil servant* ("I know a civil servant, but when is he higher?" Interviewee #4), and *manager*: " 'Manager' is a hollow word. It ranges from head of the human resources [management department] of Philips[15] to manager of the employment agency next door**.** **'**Assistant franchise manager of Albert Heijn',[16] that is nothing. The stocks are ordered automatically, it's just filling shelves and mopping floors" (Interviewee #8). *Doctor* is considered broad "yet clear" (2). *Teacher* can also be confusing (2) as "other people may count" primary school teachers also as teacher (and do, see introduction). Instead of too loosely defined occupations, some interviewees suggested expansions: "Yes, a nurse. That includes home care. I wouldn't actually call it nursing care, but it requires similar skills, like occupations such as social worker and therapist. These occupations are not on the list, however. Nurse is the only 'social' occupation" (Interviewee #12).

On eight occasions, overlap was reported between occupations (each combination mentioned once). *Mechanic* was thought to overlap with *information technologist* or *engineer*, respectively: "the mechanical worker I know does similar work as an engineer does. His original level of education is lower, but through an internal training at his job he is now on the same level as an engineer" (Interviewee #1).

[12] A guess based on literal interpretations of 'ploeg' (plough) and 'baas' (boss).

[13] Both the bar and soccer interpretations are based on 'ploeg' as (shift, team).

[14] To some ears 'mechanicus' sounds more like German ('Mechaniker' (mechanic)).

[15] Dutch electronics and health care system company.

[16] Large Dutch supermarket chain.

Construction worker and *higher civil servant* were also linked to other professions twice. Interviewee #3 claimed that in the Netherlands, *scientists* are "probably" also *higher civil servants*.[17]

Retrieval: remembering alters and their occupations

Many respondents mentioned *forgetting alters* and groups of alters; three reported they did not oversee their network at once. After completing the PG, they realized they had unintentionally overlooked certain alters: "By the way, I haven't even considered my partner's relatives" (Interviewee #6). Interviewee #25: "Well, it takes a lot of thinking. The circle of friends and acquaintances is far more extensive than you would expect. I'm thinking of people that are close to me, but funnily enough, I'm leaving out my cousins, which I shouldn't. And when you start thinking about it properly, I suddenly realize I surely know a nurse, of course I do!"

Although no time limit was set, four interviewees expressed they needed more time to memorize all their alters. "It's difficult. There's not always a name that pops up. Then I answer: 'no-one'. It would take me at least two hours to come up with a proper answer [to the PG]" (Interviewee #14); "It's hard to think of your entire network all at once. At first, I only think of my family and friends" (Interviewee #3). Because remembering alters was time consuming, interviewee #3 suggested: "I wondered: wouldn't it be better to send out the list of jobs before the interview? Now I got the feeling that I couldn't take my time to think about the questions. It's not the way I like to do it. I know lots more of people, but I have to take my time to think about it, especially about my acquaintances". That overseeing the network was demanding was also shown by the fact that some interviewees suddenly remembered additional alters in occupations during the rest of the interview.

The next question was "Are there any occupations on the list that made you think of an occupation of someone you know, but then decided *that is probably a different occupation*? If so, what did you think? Which were these occupations?" None of the respondents was completely oblivious about alters' occupations, but five interviewees mentioned not to remember the jobs of all alters. "It struck me that I hardly know what people do. I have to think hard to remember what people do for a living. You'd think I remember, but I don't. I don't know if I did a good job here, I might have left out someone" (Interviewee #11); "Tricky… I can't help feeling I might have overlooked someone, or that I didn't get their jobs right. I may have some people among my friends who I didn't put on the list but should possibly have been there. It's rather difficult, you have to know exactly what people do" (Interviewee #15). Sometimes, people lack knowledge about occupations of just a specific group of alters: "I'm not really sure what my relatives do for a living. I have loads of relatives, but I only know my mother's family really well" (Interviewee #24).

Rather than 'filling occupations with people', some interviewees explicitly reported that they tried to compare specific alters they had in mind to the specified occupations, and then evaluated their 'fit'. "Takes some thinking, what do they all do, all these people I know? I just think it's really difficult. Take a gardener, do we see him as a farmer? You can't find gardener on the list" (Interviewee #12). Interviewee #17, on the other hand, marked some jobs without specific alters in mind on the likely basis that someone she knew would fit them, because alters may also change jobs: "'Higher civil servant', 'manager', 'director of a company', I wouldn't know anyone to fit the bill, cause I often don't know what people's work really comprises. I have a general idea of what they do, but they might still be managers or they might have sold

[17] Practically all Dutch universities are publicly funded, which makes scientists 'civil servants'.

their business, I don't know". Three other interviewees also mentioned the difficulty of people changing occupations: "A friend of mine was a postman. He did it part-time during his studies, some years ago. I don't know if he still does it, probably not" (Interviewee #20).

A specific interview question was "Were there any people you thought of with more than one occupation?", with optional probe "For instance, because this person has more occupations? If so, which occupations?" Thirteen interviewees mentioned one or two alters in response to several occupations, well-spread over all subgroups. In nine cases, the jobs seem to be related, such as 'director of a company' and 'accountant' (twice), 'manager' and 'salesman', and 'doctor' and 'nurse'. Other combinations referred to alters that actually had multiple occupations: 'teacher' and 'nurse', 'teacher' and 'police officer', 'nurse' and 'musician'. The most complicated example was a specialist bass guitar shop owner, who was considered 'director of a company', 'sales employee', 'manager', and 'musician' all in one.

Judgment: working in an occupation

To investigate whether all alters were working, a specific question was: "Let's go through the occupations in which you have marked people you know. Do these people actually earn their living in this occupation?" If necessary, a further probe was: "Perhaps you think of a person who actually is in education, retired, doing something similar to this occupation as voluntary work, or as a hobby". In only 6 interviews (mostly men) non-working alters were totally absent (Table 4).

Table 4 here

There was little confusion between personal relationships and institutional relationships, but examples included: "'Secretary', everyone who works will know one" (Interviewee #1); "'Hairdresser'? 'Cleaner'? I know them, but because I pay for them, I won't call them by telephone. Ok, I do not include them" (Interviewee #17). Omnipresent non-working alters are pensioners; sixteen interviewees (46%) marked at least one retired alter, but some explicitly expressed doubt whether they were actually allowed to do so "I wondered when you count someone as working. I know a construction worker, he's been retired for two years now. Strangely enough, I did include him. I did however not include my father, who was a teacher, until 20, maybe 30 years ago. Apparently, that [knowledge] fades away" (Interviewee #3). Many more women (69%) than men (25%) included at least one retired alter. Among lower educated interviewees (67%) and interviewees aged 55 an older (67%), retired alters were also mentioned more often than in comparison groups (Table 4; the Fisher exact test for small samples was applied here).

Nine out of 35 respondents (26%) included alters who no longer work in the marked occupation: they switched to another job or are currently unemployed (Table 4; no remarkable gender, education or age differences). To our surprise, also deceased alters showed up during the interviews (6): "Salesman… and if he passed away? Then he is no salesman anymore" (Interviewee #10). Older interviewees named deceased alters more often. Three interviewees mentioned alters who are still in education for the associated occupations, two of them younger interviewees. Another small group of interviewees (all higher educated) indicated alters in an occupation as a hobby: a 'cook', the three others 'artist' or 'musician'. Finally, Interviewee #17 aptly questioned the whole concept: "Take for example cleaner. I do that myself. I know people who occasionally do someone's hair. I think it's interesting to question: what is an occupation and what is just someone doing something? Some things are clearly a profession, with a diploma and certificates and training and such. Other things are less clear. Maybe you can even be director of a company without having a job".

Discussion

We investigated how interviewees responded to a well-known version of the PG, asked them to reflect on the task, and answer specific questions about the response process. Almost all ambiguities included in our propositions were encountered, although with varying frequencies, and showed different response scenarios. Table 5 lists a typology of these accompanied by typical evidence, and an impression of how likely these effects seem to occur.

Table 5 about here

The most popular occupations in our data were also the most often mentioned items in the original SSND 1999/2000 survey (van der Gaag et al., 2008). However, the average total number of positive responses to PG items was higher (17.35 vs. 14.61 occupations).[18] The most likely causes for this difference are are within the research setting, which stimulated the respondents to fill in the questionnaire as well as possible. Different from the original SSND PG setting, interviewees anticipated, and were given a lot of time to respond to a limited number of questions, anticipated questions about their answers, and sometimes added more alters during the interview. It was also clear that respondents saw the interview as a social occasion (Bailey & Marsden, 1999:290), and were stimulated by the conversation.

Ambiguities in responses

Comprehension

Many item interpretation difficulties were mentioned, with some items featuring more prominently. Remarks about 'foreman' and 'trade union manager' were examples of *unfamiliarity*: respondents who did not know what these occupations meant rarely encountered these words. As encountered earlier (Martin Paul Webber, 2008:128) names of occupations can become stale, and the meaning of occupational titles also changes over time; as reflected by one respondent, 'manager' indeed seems to be more omnipresent and inflated on the current Dutch labor market compared to 1999. Some occupations sound only partly familiar and need further specification: 'policy maker' and 'information technologist' are considered too general, therefore do not easily remind of fitting alters, and hamper judgment about those who are remembered. Remarks about 'unskilled laborer' and 'higher civil servant' prove that formal occupational titles may make sense to researchers, but are too abstract for respondents. An effect not originally anticipated was perceived overlap between occupations on the list (as opposed to alters having multiple jobs).

Retrieval

Many respondents spontaneously expressed difficulty having to search their 'social memory' on the basis of occupations, illustrated by the fact that single alters or groups of alters were sometimes suddenly remembered *after* responding to the PG, to discover they were initially completely overlooked. In the recall of networks, a substantial proportion of alters is often forgotten; although it is difficult to predict the proportion and type of alters, there is a slight emphasis on weaker ties (Brewer, 2000). There is also some evidence that persons reported in response to more particular questions (such as on specific social support relations) are more often forgotten. PG items are different from the studies discussed by Brewer

[18] An independent sample t-test reveals that the differences are significant.

(2000) in that they are not about roles, relationships, exchanges, and support the respondent is directly involved in, but about an alter characteristic that does not directly affect them. This probably makes alters harder to recall on the basis of occupations. The method was therefore sometimes commented on as frustrating, also because not remembering anyone in occupations can make the respondent feel like a social loser (Lin & Erickson, 2008b), and responding positively to items is much more enjoyable in general (B. H. Erickson, 2004a). Webber (2008:159), though, reported good to excellent test-retest values for PG items in a 2-3 week time interval, especially for 'member of parliament' and 'factory worker', but not for 'nurse' and 'sales assistant'.

To many, the PG procedure feels as 'reversed' to their usual awareness of alters' existence, or remembering them. Indeed, when respondents are asked to freely recall persons, they tend to be guided by social structures (Marsden, 2005). Graduate students, for example, tend to the name students of their own cohort first, followed by the cohorts one year above and below them, before naming students from more distinct cohorts (Brewer, 1995). Our findings not only support this theory, but in some cases explicitly showed that respondents alternate between a search in memory for identifiable people, groups of people or contexts, and then match these with the questionnaire items. Anecdotal experience also shows that the memory for social relationships hardly connects contexts, and perhaps keeps them actively separated: family members, colleagues, friends, fellow club members and people from the neighborhood are rarely seen together. Imaginary introductions between them may often feel contrived, and we are generally surprised when people from different contexts happen to know one another.

Respondents extensively reflected on the limited amount of knowledge they have about alters' occupations. A simple, but often occurring explanation is job change: many alters did not, or probably did not work in a certain job *anymore*. Knowledge about alter's occupations indeed ranged from being completely blank, via vague ideas and roughly knowing activities or content alters spend their time with, to confident ideas about occupations. Respondents may form a distorted, but more stable image of others' occupations than their own (de Vries & Ganzeboom, 2008). We found several sources of confusion: uncertainty about whether variations actually fit the description ("is an orthodontist also a doctor?"), and uncertainty about how alters' official job titles are called: "I might know someone who does it, but I wouldn't know that it has this name".

Remembering alters' occupations may be difficult for several reasons. Some may rarely talk about their work, or not see work as an important topic in social relationships (see opening quote). However, an occupation tends to be a generally visible characteristic, and is often even a conversation opener with newly met people. Nevertheless, alters may use local terminology about work that makes little sense to outsiders (de Vries & Ganzeboom, 2008), and even when they do make clear very well what an average day at work looks like, the exact occupational title may not linger. In reality, many names of occupations are less clear than those in a good PG, and have generic 'function titles' that hardly stimulate memorizing them, like 'service implementation manager', 'assistant controller', and 'senior director'. These mean little to outsiders, and make little impression in conversation with non-colleagues. In addition, they may be inconsistently used and defined between employers, which further hampers remembering them.

Better knowledge about alters' occupations can be expected from the most frequently encountered part of the network (Marsden, 1990), colleagues or alters having jobs similar to ego (van der Gaag, 2005:128), or simply because some occupations stand out more in memory through 'positive distortion' (Feld & Carter, 2002). Moreover, Erickson (2008) has shown that some occupations are simple more well known in the population because they have more *networking power*. This is partly because of the number of

people in that occupation, but much stronger so because of their prestige. People in higher prestige occupations have better opportunities to meet people and be known by others, participate more, and in more interactions with others, on and off the job (B. Erickson, 2008). Nevertheless, other studies have only found weak correlations (<.30) between item popularity and prestige values of occupations (Verhaeghe et al., n.d.; van der Gaag et al., 2008).

Confusion about alters' occupations sometimes resulted in the same alters being mentioned in response to different occupations. Three different scenarios were identified. First, some responses to occupations with certain alters can be later improved upon, when occupations later on the list seem to fit that alter even better; the initial response is then generally left uncorrected. This is an order effect than can be prevented. Second, respondents may perceive aspects of multiple items that together remind them of an alter, and mention both to be sure. Third, respondents indicated that multiple occupations indeed applied to single alters because they had several jobs.

Judgment

Our proposition that some occupations would be more salient, or might get more positive responses for reasons of social desirability was unwarranted. There was also no evidence that interviewees were inclined to represent their network as more interesting than it was. Yet, it could be that our procedure that asked respondents to identify alters with names prevented 'false' alters that would appear in postal or web survey mode. For example, we did find some evidence for 'false positives' with respondents who *guessed* (and marked) they knew people in certain occupations, while not having actual alters in mind.

Although mentioned by some respondents, there was little doubt about whether alters were actually personally 'known', even though the 'knowing criterion' was not always included in the interview, and several PG items ('doctor', 'director of a company', 'secretary') could easily be mistaken for non-social capital. This confirms earlier work by Erickson (2008), who found that cashiers were not mentioned more often than other low-prestige occupations. That 'knowing' is seriously considered by respondents was illustrated by an interviewee who recognized his neighbor was a police officer, but did not mark the item since he "didn't know him that well".

Whether alters were actually *working* in occupations was a judgment that initially tended to be overlooked by respondents. Clearly, the PG stem question instructing to mention people "'in ' these occupations" left room for interpretation, was gradually forgotten, or was stretched in meaning during the interview. Only a minority of interviewees reported *all* alters to be working. The most often mentioned alternative status was retirement. The fact that these were more often mentioned by older interviewees is likely to result from strong age homophily effects (McPherson, Smith-Lovin, & Cook, 2001). Unexpectedly, respondents also mentioned network members who had been deceased for some time, and more often so when they were older. Not many alters were still in education, and hobbies were only suggested as 'cultural' occupations by a few higher educated respondents.

How well do alters not working in occupations represent social capital? The PG is centrally based on the idea that access to resources is inferred from '*being in* a certain occupation'. Propositions from Lin's (2001) theory on social capital are that having access to persons with high-prestige occupations gives 1) access to large resource collections, and 2) such alters may exert important influence in their (second-order) social networks. In terms of mechanisms, individual social capital is hypothesized to become productive through *facilitation*, *opportunities*, *references to external parties*, *social credentials*, and *personal stimulation* (Lin, 1999, 2001). Compared to people working in occupations, alters still in education will generally control fewer resources, have smaller networks because they are younger, and

may also lack the experience to successfully network for others. Pensioners, on the other hand, are potentially very experienced in this, and can still be excellent advisors and referees, but may gradually lose touch with their professional network and reduce (network) activity and influence. Non-working social capital can therefore certainly be productive, but is perhaps less flexible and multifunctional on a population level.[19] Strictly, deceased alters defy definitions of social capital about "social resources that can be exchanged on the basis of trust". Deceased alters may not provide much active, resourceful input, but may also act as social credentials (by nobility or reputation), resources (by inheritance), and stimulation (by fond memory and inspiration). However, when we regard an individual's *location* in a living society as a fundamental indication of resources a person can supply (B. H. Erickson, 2004b), this makes less sense.

Implications for measurement

Although some ambiguities can be prevented, our findings point towards many sources of uncertainty for the PG respondent. This may result in forgetting, unreliability of item responses and, eventually, social capital measures. Since the objective of the PG is not to make an inventory but an indication of reach into society, forgetting is not as much a problem as in estimating complete network contents. However, the question is whether forgetting is more prominent for certain occupations of alters, or whether occupations of different status groups are better remembered than others. There is some evidence that separate groups of respondents differ in their way of dealing with the items (Verhaeghe et al., n.d.), or may have different awareness of their alters' occupations, which could be subject to further research. Most item unreliability seems to stem from a lack of knowledge about alters. Because the occupations in a set of PG items may each be affected by different ambiguities, it is unclear what their combined effects are for the reliability and validity of measures. The stability and reliability of measures improves when the number of items they are based on rises. Many effects could therefore level each other out as long as PG measures are used that are based on multiple items, such as *average accessed prestige, total amount of prestige,* or *total number of accessed occupations* (all based on the total number of items). *Highest accessed prestige* (based on just one item) and *range of accessed prestige* (based on 2 items) are more vulnerable.[20]

The question is also, whether differences in responses are systematic, predictable, or important. In a Hungarian study, a correlation of .62 was found for the number of accessed positions after a one-year interval (Angelusz & Tardos, 2008; Lin & Erickson, 2008b). In a Canadian study, most scores to individual occupations were repeated after a time interval of one and a half year, and people did seem to refer to the same contacts in these occupations (Erickson 2004a). The exact list of occupations may play a large role in reproducing someone's location in social structure, however. When two lists of different occupations with similar prestige and class distributions were completed by the same respondents, weak reliability for most prestige-based measures was found, but good reliability for the total number of accessed occupations (Verhaeghe et al., n.d.). The effects of inconsistencies may have serious impact on validity. When the three most ambiguous items found in the present study were left out of PG measures,

[19] Note that other non-working network members that do not have any occupational title, such as homemakers and school children, are overlooked by the design of the PG (van der Gaag et al., 2008).

[20] These measures cannot be computed for respondents who only give positive answers to one, or none of the positions (Lin & Erickson, 2008b).

predictive coefficients of social subgroups reacted differently for the SSND data; most sensitive were gender effects (Appelhof, 2011b).

PG respondents deal with item ambiguities in roughly two different ways. A conservative strategy aired by many is that when in doubt, they do not respond positively to items. Only some took more risks and were inclined to respond to occupations on the basis of 'probability', or 'forcing alters in mind to occupations on the list'. Although cautious response behavior could be explained by the presence of an interviewer, this provides some evidence that systematic withdrawal of potentially 'fitting' alters occurs, that do not show up in responses. This would imply that PG items that get low responses may also be little understood. Another potential cause for underestimation is doubt about whether alters are working in occupations – this also prevents positive responses. Finally, evidence for general underestimation is formed by the fact that many additional alters are remembered later during the interviews, for which there is generally no time in other versions of the PG.

Limitations

Although our sample was large enough to hint on relative occurrences of some effects, we mainly aimed for an explorative detection of different ambiguities. By asking respondents explicitly whether they had experienced any of the preconceived misunderstandings, and we did find these, we could interpret their answers as largely reflecting our suggestions. However, not only did we encounter many spontaneous questions and remarks about the PG *before* we asked our explicit questions, we also unveiled some additional, unforeseen problems. In addition, it is likely that the face to face mode in which this study was performed may even have caused respondents to more accurately handle the PG than they would have in an unaccompanied postal or web survey mode. In a replication study, it would be useful to actually call samples of alters, and see how well their occupations were actually remembered.

Conclusions

Judging whether you know people in occupations seems straightforward, but can turn out to be complex. Our results imply that correctly responding to a PG can be a relatively demanding task, to which the network is sufficiently nor conveniently overseen by 'social memory', and which involves a quite a number of uncertainties. Earlier research has shown convergent effects in PG studies, and as a measurement instrument, the PG is certainly able to detect variation in access to the structure of social locations. The instrument also has interviewees seriously respond about alters. However, measures based on multiple items should be used. An interpretation of the measures in terms of more or less exact social resource quantification via occupational prestige should perhaps receive less emphasis. Instead, the responses seem to offer a more general impression of social location or networking 'intensity', also signifying how well respondents have information about their networks *available* – which is at least an indicator for being able to access their 'social capital'.

How can measurement problems with new PGs be minimized? Since most *comprehension problems* result from the formulation of occupations, these can be prevented by careful selection, writing, and pre-testing. We invite readers to use Table 5 as a test sheet for new versions and observe whether any effects are likely. Since many ambiguities hinge on the exact wordings of single occupations, an improvement could be the use of multiple job titles per item. Respondents then indicate whether they know alters in at least one of the two or three occupations listed – within a certain occupational prestige level and with similar content. Although a potential problem with this format could be over-popularity of the items, cognitive interviews conducted in the same fashion as discussed in this paper showed the instrument was well handled by respondents (Appelhof, 2011a); subsequent research showed sufficient variation in

responses (van Esch, Petit, Neuvel, & Karsten, 2011). *Judgment problems* with the PG seem to be largely about the working status of alters. These may be prevented by sharpening the stem question or response options of the PG, asking specifically for alters *working* in occupations. In contrast, PG *retrieval problems* evolve from the inherent difficulty of activating the memory for occupations of social network members. This is a problem not easily solved.

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Table 1: Position Generator (*Survey on the Social Networks of the Dutch* (SSND), first wave, 1999/2000; Völker & Flap, 2004; 2008)

	"Do you know anyone who is a/an…"	*Family member*	*Friend*	*Acquaintance*	*No one*	*ISEI*[a]
1	Doctor					87
2	Cook					30
3	Engineer					68
4	Higher civil servant					61
5	Construction worker					26
6	Director of a company					69
7	Manager					69
8	Teacher					66
9	Estate agent					61
10	Trade union manager					65
11	Lawyer					83
12	Mechanic					59
13	Bookkeeper/accountant					51
14	Scientist					71
15	Policymaker					70
16	Musician/artist/writer					64
17	Information technologist					70
18	Police officer					50
19	Secretary					53
20	Insurance agent					54
21	Foreman					43[b]
22	Nurse					38
23	Farmer					43
24	Truck driver					34
25	Postman					39
26	Engine driver					34
27	Sales employee					43
28	Unskilled laborer					26
29	Cleaner					29
30	Hairdresser					30

[a] Column not shown to interviewees; ISEI: International Socioeconomic Index (Ganzeboom et al., 1992)

[b] In some SSND studies, a foreman is supposed to have a lower prestige rating (25) than construction workers (26) under his supervision; a more accurate ISEI-value is 43 (de Vries & Ganzeboom, 2008).

Table 2: First impressions of PG after responding (N=35; multiple impressions per respondent possible)

First impression	*Times mentioned*
Feelings	
Nice	6
Not difficult/easy	3
Difficult	2
Makes you realize who you know	1
Like a browse through your Facebook	1
Hard to oversee it all at once	1
Useful to see it this way	1
Occupations	
Many jobs are old-fashioned	2
All jobs are clear	1
Few jobs in social work	1
Linking alters to occupations	
I don't know everyone's job	5
Difficult to find people that do the job	4
Takes a lot of thinking/a lot of time to think well	4
I saw someone do the job, but who was it?	3
I overlooked certain people (family/cousins/colleagues)	3
Many jobs of people I know aren't on the list	2
I know everyone's job	1
Some people changed jobs	1
Disappointing to see in how few jobs I know people	1
I focused on people I met last year	1
Response categories	
Difficult when someone is acquaintance	4
Where do colleagues belong?	3

Table 3: Frequencies of occupations with ambiguities mentioned in PG interviews (N = 35)

	Times mentioned	*Gender*		*Education level*			*Age*		
		Males (20)	Females (15)	Low (12)	Medium (9)	High (14)	18-35 (13)	36-55 (11)	55+ (11)
Unskilled laborer	**9**	6	3	2	3	4	4	2	3
Foreman	**8**	6	2	3	2	3	7	0	1
Policymaker	**8**	5	3	1	3	4	3	2	3
Information technologist	**5**	2	3	2	1	2	2	1	2
Higher civil servant	**5**	3	2	2	0	3	4	1	0
Manager	**3**	1	2	1	0	2	1	0	2
Mechanic	**3**	0	3	0	1	2	1	0	2
Trade union manager	**3**	2	1	2	0	1	2	0	1
Doctor	**2**	1	1	0	0	2	0	1	1
Teacher	**2**	1	1	2	0	0	0	1	1

Table 4: Frequencies of alternative statuses of alters in occupations, as mentioned by interviewees (N=35)

	# Interviews[a]	*Gender*			*Education level*				*Age*			
		Males (20)	Females (15)	p[b]	Low (12)	Medium (9)	High (14)	p	18-35 (13)	36-55 (11)	55+ (11)	p
Everybody works	**6**	5	1	.207	**1**	**4**	**1**	**.074**	3	2	1	.855
Retired (any)	**16**	**5**	**11**	**.007**	8	3	5	.249	**3**	**5**	**8**	**.054**
1 alter	10	3	7		4	2	4		3	2	5	
2 alters	4	1	3		2	1	1		0	3	1	
3 alters	1	1	0		1	0	0		0	0	1	
12 alters	1	0	1		1	0	0		0	0	1	
Deceased (any)	**6**	3	3	1.000	2	2	2	1.000	**0**	**2**	**4**	**.055**
1 alter	4	2	2		2	2	0		0	1	3	
2 alters	2	1	1		0	0	2		0	1	1	
In education (any)	**3**	2	1	1.000	1	0	2	.769	2	1	0	.760
1 alter	1	1	0		0	0	1		0	1	0	
2 alters	1	1	0		1	0	0		1	0	0	
4 alters	1	0	1		0	0	1		1	0	0	
Now in different job / unemployed (any)	**9**	5	4	1.000	3	3	3	.888	3	3	3	1.000
1 alter	8	4	4		2	3	3		2	3	3	
3 alters	1	1	0		1	0	0		1	0	0	
Hobby (1 alter)	**4**	1	3	.292	**0**	**0**	**4**	**.031**	1	2	1	.820

[a] Some interviewees specified non-working alters of several types; numbers form an underestimation because not all non-working alters were discussed.

[b] Significance of Fisher's exact test for 2x2 (gender x any) or 2x3 (education x any; age x any) tabulations (e.g. any retired alters mentioned vs. no retired alters mentioned). Bold numbers significant at the .1 level.

Table 5: PG ambiguities and evidence for their occurrence in interviews (N=35)

Type	*effect*	*evidence*	*occurrence*[b]
Comprehension[a]			
P1:	Unfamiliarity with occupational content	Occupations judged as old-fashioned, too general, or too formal	+
P2:	Divergent ideas about occupational content	Varying understanding of job contents and levels	++
[unanticipated]	Perceived overlap between pairs of occupations	Remarks about alters fitting more occupations	o
Retrieval			
P3:	Not remembering alters indeed having specified occupations	Single alters and groups/classes of alters suddenly remembered during interview	+
P4a:	Lack of knowledge about alters' occupations	Guessing that alters must be known in occupations without alter-specific effort; complete unfamiliarity with what alters do	++
P4b:	Doubt whether occupation is close enough to alter's occupation	Expressed doubt about alter's official job title; forcing of well-known alters into specified positions	++
P4c:	Linking multiple occupations to the same alter	Alters have jobs that resemble multiple occupations; alters mentioned again as later encountered occupation fits better	+
Judgment			
P5:	Erroneous judgment about when someone is 'in an occupation'	Mentioning retired alters, alters still in education, deceased alters, or hobbies seen as occupations	++
P6:	Erroneous judgment about personally or institutionally knowing people	Remarks about omnipresence of secretaries, hairdressers, etc.	o
social desirability			
P7:	Different responses to more salient occupations	Not noticeable	?

[a] numbers refer to propositions in introduction [b] signs refer to estimations of occurrence: -- not likely at all, - not likely, o somewhat likely, + likely, ++ very likely