

Proposals for the Measurement of Individual Social Capital

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During the last fifteen years, the idea of social capital has been elaborated in the social sciences as a promising, new look on sociological phenomena and a theory that shows how and why relational networks are important for explaining various individual outcome measures. Various unresolved issues and ambiguities still remain, however. One of these is the measurement of social capital (Flap 1999, Lin 1999a, 2001). Although many studies have focused on the distributions and specific consequences of social capital, similar theoretical elements have been operationalised into many different measurement methods. Standardization in measuring social capital appears to be still far away (Flap 1999, Snijders 1999, Lin 1999a, 2001). There has been an abundance of ad hoc measures, often derived from data that were not specifically designed for the measurement of social capital, but that happened to be available for analyses. This has made thorough and specific testing of social capital theory difficult by lack of possibilities for structural comparisons.

In the following sections, we will first discuss different theoretical approaches to measuring social capital. Based on a number of arguments about what we mean by social capital and how its measurement could be tackled, we propose the so-called *Resource Generator*. Question items forming such a Resource Generator have been included in the

survey of Social Networks of the Dutch (see Völker and Flap herein) along with other more traditional measurement instruments. Some first results are presented below.

WHAT DO WE MEAN BY ‘SOCIAL CAPITAL’?

As a preliminary to proposing a measurement instrument, it is necessary to more specific about what, in this chapter, we mean by the concept of social capital.

The Individual or Social level?

Social capital has aspects on both the individual (micro) and collective (macro) level, and its quantification therefore involves phenomena on both levels of analysis. Theory development and empirical research have taken place on separate, sometimes diverging levels, however. Some authors (Coleman 1990, Putnam 1995a, 1995b) elaborated theories specifically on the macro-level, where social capital is seen as a collectively produced and owned entity, from which the whole community may benefit. On the collective level, social capital is often taken to be represented by norms, trust, and social cohesion. Other scholars (Bourdieu 1980, Flap 2002, Erickson 1996, Flap 1999, Lin 1999a, 2001) focused on social capital as an additional pool of resources for the individual, which may be helpful for the individual's goal attainment. Lin (1999a, 2001) defined social capital at the individual level in a cogent and clear way. The present chapter follows this tradition.

Social capital at the individual level has been defined by many scholars in roughly similar ways. This chapter proceeds on the basis of a definition that combines insights

formulated by Lin and Flap. Flap (2002) argued that individual social capital is defined by three dimensions: 1) the (number of) alters in the individual's social network, 2) the resources these alters give access to, and 3) the availability of these resources from alters to the focal individual, of which the willingness of alters is a major component. Lin 2001:29) defined social capital as 'resources embedded in a social structure that are accessed and/or mobilized in purposive actions.' On this basis, we define an individual's social capital here as

The collection of resources owned by the members of an individual's personal social network, which may become available to the individual as a result of the history of these relationships.

Social capital is thus equivalent to 'access to social resources' (Lin 2001) at a certain moment: an accumulated potential, parts of which could be used by an individual would the occasion call for it. Although defined on the level of the individual, we must also recognize that the role of social capital in daily reality is strongly linked to macro-level aspects, or '... to the location and patterning of (...) associations in larger social space' (Sandefur and Laumann 1998:484). We will get back to this point in later sections.

Specificity to Certain Populations and Certain Goals

Social capital measurements have often been employed either concerning specific life domains (e.g., in the literatures on social support and on labor market success), or in very specific populations (such as males – Lin and Dumin 1986, Lai *et al.* 1998; urban dwellers

– Fischer 1982; higher educated job searchers – Boxman, De Graaf and Flap 1991, Boxman 1992; security industry employees – Erickson 1996; the elderly – Thomese 1998; etc.). What is a valuable social resource depends on the needs, goals, and opportunities (including the available economic, intellectual, skill-related, and institutional resources) of the individuals making up the population. We focus in this chapter on general collections of social resources that are valuable in general populations. This means that we look for broad sub-domains of life, within which social resources serve a meaningful purpose for most individuals in the general population.

Any resource that may help in goal achievement of the focal individual but is in fact owned by a social network member can be regarded as a constituent of social capital. The consideration of a *general* collection of social resources will therefore necessarily have to be an extremely varied one. Consequently, the measurement of social capital should range across several domains of life (e.g., from the home to the work floor), and from the strictly material (e.g., borrowing sugar or money) to the strictly immaterial (e.g., provision of information, affection, and influence) (also see the contribution Degenne, Lebeaux and Lemel in this volume).

On the basis of common knowledge as well as the empirical literature it is clear that for the attainment of particular individual goals, not all kinds of social resources are equally important. The extent to which only specific parts of someone's social capital are responsible for certain outcomes is an interesting question. Such more specific productivity questions can be headed under the name of the *goal specificity* of social capital (Flap 1999). The possible answers to this question move between two extremes. On the one hand, we can think of social capital as the 'castor oil' of transactions (Flap 2002): knowing the right

people may help in unforeseen ways, and social capital often emerges as a by-product of non-specific transactions – the latter may imply high correlations between the amounts of different resource sub-collections available to individuals. For example, achieving personal well-being in the form of affection or behavioral confirmation can come from many, sometimes rather *unspecific* others we know, often also unintended, and the same human interactions may enhance the attainment of other goals, such as success at work. On the other hand it is known from research on occupational status attainment that only very *specific* resources of social network members are critical in helping to find a job (Lin 1999b). In some situations therefore, social resources need to be very specific to be useful in attaining goals. Given our focus on general collections of social capital, this implies that a wide variety of different social resources will need to be covered by the measurement instrument.

HOW TO MEASURE SOCIAL CAPITAL?

Some general choices about how to measure social capital have to be made before we can actually embark on proposing a measurement instrument. We shall discuss whether to use hypothetically available or actually used social capital; whether to strive after a single measure or several measures; and how to aggregate over different resources and different network members in constructing a quantitative measure of social capital.

Access or Use Measure

In the definition of social capital at the individual level, a distinction must be made between the mere access, and the actual use of social capital (Lin 1999a, 2001). One could either focus on *access*, and make some kind of catalogue of people's stock of potential access to resources held by their network members at a given moment; or focus on *use* and investigate what people have actually achieved with the help of their network members. We will discuss both possibilities, and motivate our choice for the first option.

Social capital as defined in our first section represents *access* to social resources: an accumulated potential that could be mobilized by an individual would the occasion call for it. Descriptions given in the literature of this access to social capital, or the *network resources* (Lin 1999a), comprise either the resources themselves or aspects of the collection of social resources as a whole (e.g. resource variety, range of resources, upper reachability, or typical compositions), but without referring to the consequences of social capital. Following the anatomy described by Flap (2002), measuring access to social capital could constitute of making an inventory of resources within the individual social network and measuring the three dimensions alters, resources, and availabilities. The advantage of developing social capital measures only comprising these three elements is that they are relatively context-free. The question could be, however, if measuring social capital access only is not a little inefficient. Only a small fraction of the potentially accessed social capital is actually mobilized, and for good reasons. First of all, most individual goals are attained mainly by applying personal or institutional resources, without recourse to social capital. Second, several network members often give access to the same kind of resources, and only one of these suffices to attain the goal. For measurements comprising a full catalogue of

resources, we can therefore expect that even in a situation where it is certain that social capital is productive, the amount of variance of some outcome variable explained by social capital will remain relatively low: only a fraction of the measured social capital items will after all contribute actually to the individual's goal. Partly, this problem can be minimized by a well-founded selection of questionnaire items, and well-founded construction of social capital measures with these items (we get back to this problem below).

The *use* of social capital comprises the mobilization of the available resources within the social network. Measurement of the use of social capital would therefore concentrate more strongly on actions and outcomes. Because only a fraction of the accessed social capital is mobilized, measuring actually mobilized social capital may therefore seem closer to goal attainment, because it avoids unemployed parts of social capital. However, concentrating measurements on the use of social capital also gives rise to specific problems. The source of these problems lies in the fact that the mobilization of social resources depends not only on the *presence* of social capital in the social network, but is also an outcome of an individual decision process that is closely intertwined with the needs of the individual, and the access to other, non-relational, resources. We can distinguish factors in this process at both the individual and collective level.

In the first place, the need for help differs between individuals (due to differences in health, in goals, etc.). Second, they have different bundles of non-relational resources (wealth, skills, etc.), which are alternatives for dealing with these needs. Further, as social capital mobilization requires certain skills and also creates obligations for repayment in the future, its use is not free, and if a 'cheaper' resource is available, the latter will be chosen. This implies that asking for help is the outcome of a choice, sometimes a conscious

decision process. Varying personal morals, ethical codes towards asking other people for help, and more rational considerations regarding future obligations, will also lead to differences between individuals in their tendency to mobilize social capital for certain problems. Some people simply do not like to ask others for favors, because they take pride in being self-sufficient, or because they do not want to create outstanding debts. All these factors cause differences in the extent to which the available social capital is mobilized, which do not become clear if we only measure the mobilized social capital itself.

On the collective level, also two factors can be distinguished: these comprise the 'larger social space' in the social capital definition of Sandefur and Laumann (1998). First, the need for social resources on the individual level, and hence the eventual mobilization of social capital, is influenced by the availability of institutional solutions for individual goal attainment, and its relative price compared to that of the mobilization of social capital. For example, in the former communist countries the market for various commodities functioned so poorly that personal contacts were the usual way to get hold of many goods in irregular supply (e.g., Völker and Flap 2001). Second, the extent to which social capital gets mobilized is dependent on what Coleman (1990:306-7) called 'the level of trustworthiness [in a society] (...), which means that obligations will be repaid', which varies across as well as within countries. These problems of interpretation or comparison are, of course, absent if we decide a priori to focus on a specific context to social capital productivity.

It appears that if we concentrate on measuring the *use* of social resources, we have to proceed from a more complex context than when measuring *access* to social resources. The mobilization of social resources comprises a mixture of phenomena on the psychological, psychosocial, and macro-sociological levels. The set of measures needed to capture these

phenomena will be large, and will risk to be confounded by individual needs, styles of personal interaction, and society-specific characteristics. Here, we intend to develop general social capital measures that can serve as clear independent variables in future prospective research that could provide an answer to questions about the predictive value of social resources for various dimensions of individual well-being. Because measures focusing on access are a more direct expression of our definition of social capital and seem to invite fewer complications in their interpretation, especially for the measurement of general social resource collections, we prefer to develop measures based on access.

Multiple measures

Even for the measurement of general collections of social resources valuable in general populations, the fact that the value of social resources will depend on the specific sub-dimension of well-being under investigation, and will differ across subpopulations, cannot be neglected. There are different incommensurable individual outcome variables (income, prestige, health, leisure pleasure, etc.) that could benefit from social capital, but perhaps do so from different subtypes of social capital. Further, due to differences in needs and availabilities of alternative resources, and personality characteristics, individuals will differ in the type of social capital that is productive for them. Thus, it is utterly unlikely that there exists a uniform 'social currency unit' in social transactions in the way Coleman (1990:306) described as 'outstanding credit slips' among relationships, created by doing somebody a favor. This leads us a priori to multiple measures, in other words, to a multidimensional measurement instrument. An extra argument is that investigating the goal specificity of social capital is only possible with multiple measures.

A different type of dimensionality of various indicators for social capital is based on their correlations in a given population. If indicators that are substantively different because they are helpful for goal attainment in quite distinct domains are strongly correlated in a given population, then they constitute a single dimension of social capital for all empirical purposes. We come back to this point below.

Counting Resources in a Social Network

Our definition of social capital refers to the ‘collection of resources owned by the members of an individual’s personal social network’. This implies that, when constructing a measurement instrument for the amount of social capital useful for a given domain of individual well-being (e.g., work, daily family life, or leisure), a variety of resource items useful in this domain must be considered, and the social capital measure has to aggregate over these resource items as well as over network members. In discussing this aggregation, we follow some thoughts proposed already in Snijders (1999).

An implementation of the ideas in Flap (2002) of social capital being constituted by the network members, their resources, and the availability of these resources, leads to a formula of the kind used, inter alia, by Flap and De Graaf (1986):

$$C = \sum_i \sum_j r_{ij} p_{ij} \quad (1)$$

where SC is the quantification of an individual’s ‘total’ social capital, i refers to the network member (also called ‘alter’) and j to the resource item, r_{ij} is a quantification of the resources of type j in the possession of network member i , and p_{ij} is the probability that

alter i will give ego access to his resource of type j . Such a measurement requires a delineation of the personal network (e.g. Marsden 1990), questions about the resources in the possession of the network members ('network interpretation'), and a measurement of the opportunity and willingness of alter i to give the focal individual access to resource j . The opportunity to give access to the resource in question will depend on *transaction costs* that need to be overcome, which may depend on meeting frequency, physical proximity, etc. The willingness is usually modeled via attributes of the tie between ego and alter such as strength, frequency of contact, trust, and number of exchanges (see Granovetter 1973, 1974, Marsden and Campbell 1984). Collecting all the data to use expression (1) as a social capital measure requires a full ego-centered network study including a lot of information about each alter: measurements of characteristics of the relationship between alter and ego, the resource collections of alter, and the opportunity to exchange each of the resources. To conduct such a study is quite time and resource-intensive.

Expression (1) assumes that the amount of social capital is obtained by summing over the network members: if n network members each have the same amount of resources of a given type and the same probability of letting ego share these resources, then the quantity of social capital of this type is directly proportional to n . This is not always reasonable. For some goals and resources, it may seem to be true that the more resources are available, the better. For example, the more information about job opportunities one hears, the better it may help – but only up to the point where there starts to be a duplication of information. For many goals, the availability of additional alters does not have proportional but diminishing returns: a limited number of alters usually suffices. First, the help from multiple alters can be *inconvenient*. For example, when moving to another house, only a

certain number of helpers is needed, because in larger groups coordination problems emerge (Borgatti, Jones and Everett 1998). In other cases, such as borrowing money from several others, ego may want to avoid ending up with multiple outstanding debts, which can be both administratively and emotionally unpleasant. Second, the help from multiple alters can be *unnecessary*. For some goals access to resources of only *one* alter is sufficient, making help from additional alters superfluous: when feeling lonely, one right alter providing company can suffice. Third, assistance in goal attainment from multiple alters can be *normatively restricted*. In the supply of love and sexual intimacy – indeed an example of social resources – most individuals depend usually on one alter at the time.

The most important difference in the value of social resources of a given type available to individuals will therefore often be between having access to *at least one alter* giving access to a certain resource, and *no alter at all*; the difference between the value of one and more alters providing the same resource will often be much smaller. Therefore we think that the measurement of social capital does not strictly require making complete social resource inventories of social networks, but can be based on ascertaining the existence of at least one tie to some alter giving access to a collection of important social resources. Such a ‘checklist’ approach may approximate more closely the total value of the social resources available to the individual than the total sum (1) of all possible sorts of social resources present over all alters. In addition, the required data for a ‘checklist’ approach can be collected in a much less costly procedure. The Position Generator (Lin and Dumin 1986; see also Erickson in this volume) is a measurement instrument for social capital that functions in this way. However, the representation in the Position Generator of network members’ social resources is derived from a social theory (Lin 1982) that restricts

attention to resources connected to the job prestige of network members. We propose here to develop a ‘checklist’-type social capital measurement instrument with questionnaire items representing more diverse and more concrete examples of social resources. Analogous to the Position Generator, we will call this instrument the *Resource Generator*.

The formula expressing the Resource Generator is

$$SC = \sum_j s_j \quad (2)$$

where j again refers to resource items and s_j is a measure for the availability to the individual of this type of resource. The latter measure could depend on the number of alters that could give access to this resource, the transaction costs involved, and the willingness of the alters to give access to this resource. How the number of alters enters the calculation of s_j will depend on the researcher’s specific presumptions on the diminishing marginal returns of additional alters supplying resources. The simplest way is to distinguish only between ‘no’ and ‘at least one’; a somewhat more complicated alternative is to distinguish between ‘no’, ‘one’, and ‘at least two’ (cf. Snijders 1999). The willingness could be modeled on the basis of tie strength, analogous to the procedure followed in the Position Generator (Lin and Dumin 1986): respondents are asked about the class of relationship of the closest network member giving access to the resource item under consideration. In order of diminishing tie strength, the answer categories are usually family member, friend, and acquaintance. These can be represented by numbers indicating the expected availability of resources through each of these classes of relationships, for instance by 3, 2, and 1, respectively. For the moment, we propose to refrain from including the opportunity of

accessing the resource and the transaction costs, since these seem to be of secondary importance and might contribute more unreliable noise than meaningful information.

The assumption that the terms s_j can be added is based on the ideas that each of the resource items j adds in usefulness to the attainment of individual goals in this particular domain. For example, within the domain ‘getting a job’, resource items could be the presence of network members that read different newspapers, network members that have good contacts with various businesses, network members that have good ideas about how to apply for jobs, etc. This approach is similar to the earlier construction of a social capital variety measure with the Position Generator (Lin and Dumin 1986, Erickson 1996), where the number of different items accessed is counted and expressed in a single number.

RESOURCE DOMAINS AND MEASURE CONSTRUCTION

The question what basically comprises a ‘general’ resource collection in goal attainment for the ‘general’ individual is a very broad, and therefore very difficult one. In this section, we discuss several bases to select sets of social capital items in terms of resource collections, and propose a set of items for the Resource Generator.

Positive and ‘Negative’ Social Resources

It is not imperative to equate social capital to a collection of *positive* social resources. Many scholars have remarked that social interaction is not always pleasant, and produces not only benefits, but also sometimes places severe restrictions on goal attainment (e.g., Rook 1990;

Portes and Landolt 1996, Portes 1998, Gabbay and Leenders 2000, Moerbeek and Need 2003). The negative outcomes and constraining effects of social interactions also have a place in social capital theory. However, in the present stage of measurement development, we think it is hard and probably too early to integrate these. Among all social interactions, the negative interactions (luckily) still form a minority. Occurring less frequently, their effects are harder to detect. Further, negative interactions often comprise very intimate information, and situations that would rather be forgotten by those experiencing them. This sensitive nature of such information makes these phenomena harder to investigate. Compared to social resources and social capital in the beneficial sense, a completely different methodology would therefore be needed for investigations of ‘negative social capital’, or ‘social liabilities’. We therefore concentrate on *positive* social capital in this study.

Selection of Social Resource Items

How to concretely define a set of social resource items, indicated above only by the symbolic name *j*? We cannot measure every element of social capital, so a restricted collection is needed, but it should be varied and of a very broad range, from the material and instrumental to the immaterial and expressive. By focusing on ‘general’ social capital we mean to look for sub-domains of life, and associated components of well-being, within which social resources are purposeful for most individuals in a certain population. We are therefore in need of a general theory that will help us distinguish these sub-domains, and subsequently the portions of social capital that are meaningful within these domains for the general population. Performing detailed categorizations of individual goals is a

fundamental study in itself (e.g. Van Bruggen 2001), and beyond the point of this paper. In this section we discuss various clues that may help to determine useful classifications of social resources.

First, we can return to the basis of the research program of social capital: if we wish to investigate how individuals could benefit from social resources to attain their goals, what goals do they actually have in general? A useful theory to structure individual goals is social production function theory (SPF) (Lindenberg 1990, 1996, Ormel *et al.* 1997), a socioeconomic theory that proceeds from the basis of rational choice theory. Its basic assumption is that individuals try to reach one ultimate goal, psychological well-being (less formally, 'happiness'). They do so by setting certain intermediate goals given the constraints they are facing, according to relative amounts of expected utility they attach to the attainment of these intermediate goals. SPF proposes a hierarchical structure that orders goals according to a classification of universal needs. The achievement of psychological well-being, on top of this hierarchy, is subdivided into two distinct goals: physical well-being and social approval. The attainment of these goals is promoted by endowments and by the realization of three intermediate goals: physical well-being by stimulation (food for thought, mental stimulation), external comfort (pleasant environment), and internal comfort (fulfillment of physiological needs); social approval by attainment of status (control over scarce resources), behavioral confirmation (approval for doing the right thing), and affection. Achievement of these six intermediate goals is subsequently reached by more concrete actions defined as instrumental activities, for which several kinds of resources or 'production factors' can be applied. The social production function indicates how the intermediate goals combine in the generation of the ultimate goal of psychological well-

being, and how the attainment of the intermediate goals depends on a variety of resources.

If we would like to measure general social capital, we can argue from SPF that resource items should cover those helpful for most intermediate individual goals. Although SPF explicitly structures a goal hierarchy, it is silent about which ‘production factors’ connect to various life domains and goals. A basic problem is that there is no one-to-one correspondence between goals and resources: the same resources can be applied for multiple goals, and vice versa. Strictly spoken, a thorough theoretical selection of social resource items in questionnaires could only take place if we knew enough about peoples’ social production functions.

In an exploratory study refining SPF, Van Bruggen (2001) empirically investigated what individuals see as essentially different domains of goal attainment, and specified many production factors and second-order goals for the social well-being part of SPF in particular. She identified six categories of contexts in which people produce their social well-being: 1) *private productive activities*: housekeeping, odd jobs and maintenance, child raising, self care, and informal care given to others; 2) *personal relationships*: production, maintenance, and consumption of personal relationships as the prime objective; 3) *private discretionary or recreational activities*: everything that is private, but does not concern a productive activity or personal relationship in the private domain (e.g., hobbies, recreational sports, watching TV, doing nothing); 4) *public productive activities*: paid work, voluntary work, and schooling; 5) *public relationships*: contexts in which people primarily deal with the outside world, and the general rights and obligations connected with citizenship (e.g., paying taxes, obeying traffic rules); 6) *public non-institutionalized interactions*: interaction with strangers on the street, in shops, or in public transport, use of

public media, etc. Each of these categories represents clear domains within which social resources can be imagined and translated to social capital measurement items. Resources that are applicable in field 2 are almost automatically accounted for by having any friendly relationship, because they concern the relationship as a goal in itself. The number of intimate, rewarding relationships can therefore be seen as an indication of the resources that apply to this domain. Field 6 has apparently little to do with individual social capital, as encounters with people outside personal relationships, with whom we do not share a common past, are by definition no social capital contexts.

Second, besides these empirically distinguished domains within individual goal attainment, we can also consider theoretical classifications of resource collections, or *capital* in general, to inspire the distinction of social capital measurement domains. Over the years, social theorists have distinguished several different forms of capital: financial capital, human capital, and cultural capital. Lin (1982, 2001) distinguished *wealth*, *power*, and *status* as universally valued resources. Because social resources comprise all kinds of resources within the personal network, we can easily transfer these distinctions to social resources, and conclude that general social capital at least comprises resources from each of these categories. In the social support literature, the following typology of four types of resources has gained some tradition. *Information* comprises the knowledge of network members, and their ability to obtain information from their own networks. *Emotional support* and *companionship* are fields in which social capital more or less has a monopoly in supplying resources to the individual. Whereas companionship can indicate anything social beyond a mere physical presence of another person, emotional support usually refers to interactions that are more involving (such as e.g. the well-known US General Social

Survey-item ‘discussing intimate matters’), but also help in times of problems. *Practical instrumental support* comprises mechanical services, help in moving house, borrowing material goods as money, tools, etc. Besides the nature of resources we can also define categories of social capital on the basis of characteristics of the *possible transactions* with social capital. Lin (1999) argued that these either involve *instrumental* actions, taken to obtain resources that are not possessed by ego, or *expressive* actions taken to maintain resources already possessed by ego. He also distinguishes three types of returns to each of these transactions: instrumental actions have *wealth, power, and reputation* as returns; expressive actions have as returns *physical health, mental health, and life satisfaction*. The returns to instrumental actions can be recognized as production factors from SPF, and coincide with universally valued resources. The returns to expressive actions largely resemble intermediate or ultimate goals from SPF.

Third, we can look at the *mechanisms* via which transactions with social capital are accomplished. Lin (1999) specified four such mechanisms. First, social capital facilitates flows of resources that can make goal achievement or transactions less costly compared to other ways of goal achievement (for example, an acquaintance repairing my computer is cheaper than going to a specialist shop). A second mechanism is active helping of alters: by putting in a good word, one actor can actively help the other for instance in recommending him for a job. Third, social resources may act as social credentials. Having access to certain other people can work as a billboard stating ego’s qualities, and the social capital then acts as ego’s references. Fourth, by definition social capital has a monopoly in the provision of resources involving interpersonal trust: love, attention, and other reinforcements of either personal identity or group membership (such as trustworthy, independent advice) can only

come from other actors.

Not all of the above classifications directly lead to the distinction of clear domains of potential social capital items, but they can all be used to provide useful ideas to guide the researcher in the construction of sets of social capital measurement items that cover 'general' social capital. This construction can proceed in an iterative manner. For example, we can start with the classification by Van Bruggen (2001), which refers to readily imaginable situations, and construct sets of items within each of the six distinguished domains. After this first step, we can check with the theoretical resource classification by Lin (1999b) whether wealth, power, and resources are equally represented in these domains (if applicable), whether the items represent both expressive and instrumental actions, etc. A combination of such considerations with prior presumptions on the importance of the inclusion of certain resource measures has been the basis for the composition of the Resource Generator used in this study. The set of items is presented in Table 9.1.

== insert Table 9.1 here ==

The 35 items of this Resource Generator cover most of the previously discussed categories, with at least a couple of items per category. The resources of a mostly expressive kind that refer to social relationships being a goal in itself (items 34-35) duplicate questions included in usual name generators. In the translation from theoretical classifications to actual questionnaire items, once again we encounter the problem that many actual social resources in day-to-day situations refer to more than one theoretical category of resources, and it is hard to come up with single questionnaire items that refer to realistic situations and single

resource collections at the same time. In transactions with social capital, usually more than one type of resource is exchanged, if only because the pleasure of the interaction in itself can be seen as an additional resource that is often exchanged.

EMPRICAL RESULTS: FOUR SUBSCALES

The Resource Generator was developed empirically on the basis of data, collected in 1999-2000, for a sample of 1,007 individuals representing the Dutch population in the age category of 18-65 years (see Völker and Flap herein). In this section some first results are described.

It was briefly mentioned above that dimensions in sets of questionnaire items representing social capital can be based not only on considerations concerning the sub-dimensions of individual well-being for which these items can be instrumental, but also on the correlations between these items. An obstacle to the first approach is the absence of a clear correspondence between concrete social resources and sub-dimensions of individual well-being. An argument for the second approach is the purpose to use the constructed measurement instrument in empirical analyses – in which reliability of measurement instruments requires high inter-item correlations, and the use of different but highly correlated measurement scales leads to ambiguous or meaningless results. Therefore, we follow an empirical approach to the further selection and grouping of the social capital items of Table 9.1. The correlation pattern between items also expresses which social resources are accessed independently by members of the population, and thus should be

measured separately: in terms of research on goal specificity research, independent access could also mean independent effects of resources in separate domains. The methodology with which correlation patterns as these can be assessed can either come from more traditional statistical tools such as factor analysis, which assume an interval level of measurement, or models developed for variables measured on an ordinal or dichotomous level, such as Item Response Theory (IRT) (see e.g. overviews in Van der Linden and Hambleton 1997, Boomsma, Van Duijn and Snijders 2000). Because information retrieved in social capital questionnaires will be typically of an ordinal level, IRT will provide the most elaborate and complete approach to revealing scales in social capital data.

The basic ideas behind IRT are the following. First, it is assumed that responses to questionnaire items are determined stochastically by latent traits. The values on these latent traits vary between individuals and cannot be observed directly, but can be observed, with error, through questionnaire item responses. Second, IRT starts from the assumption that questionnaire items have a small number of answer categories (usually 2 to 5) – in other words, they define discrete rather than continuous variables. This distinguishes IRT from factor analysis, which also is a latent trait model but defined for continuous observable variables. Third, it is assumed (except in some sophisticated models) that the items are locally independent, i.e., conditional on the value of the latent trait they are statistically independent. The interpretation of the last assumption is that the responses are completely determined by the latent trait together with random error, and not by other systematic variations between respondents. For dichotomous items (which comprise the most simple use of either Position Generator, Resource Generator, and possibly even name generator data), IRT will yield a better representation of the set of items and their associations than

factor analysis. This is especially the case if some of the items have a very low or a very high frequency of positive responses, because for such items the correlation coefficients on which factor analysis is based are not adequate indicators of their associations.

As an IRT method that makes few assumptions, we used the non-parametric Mokken scale analysis (Mokken 1997, Sijtsma and Molenaar 2002), implemented in the MSP program (Molenaar *et al.* 2000). This scale analysis method can be regarded as a stochastic version of Guttman scaling. It uses Loevinger's H coefficients both for expressing the fit of specific items in the scale and for the homogeneity of the scale as a whole. The formal definition can be found in the mentioned literature; here we mention only that uncorrelated items would lead to values of 0 for the H coefficients and perfect scales to values of 1, and that in practice, values of .3 are considered to be reasonable, .4 good, and .5 very good. The MSP program contains a search procedure that determines, on the basis of homogeneity constraints set by the user, one or more relatively homogeneous subscales among a given set of items. The application of this method to the 35 items of Table 9.1 led to four subscales, presented in Table 9.2. The items were used as dichotomous items, without a further distinction between the type of relationship (family member, friend, acquaintance) providing access to these resources.

== insert Table 9.2 here ==

The homogeneity coefficients indicate that each of the four subscales passes the requirements of good homogeneity. Thus, these subscales indicate four separate, internally homogeneous domains in which resources are available to members of the Dutch

population. The correlations between the subscales are relatively low (Spearman rank correlations range from .19 to .45, the highest value being between subscales I and II). This means that the four subscales give a good decomposition of a large subset of the 35 social resource items. The fact that the 18 other items do not occur in subscales indicates that their correlations with the included items are so moderate that their inclusion would detract from the measurement properties of the subscales. The four subscales may be labeled 'prestige', 'information', 'skills' (with car ownership not fitting this label), and 'support', respectively. There is no clear relation of these four subscales to the sixteen categories of items given in Table 9.1.

A detailed investigation of how these subscales relate to alternative ways of measuring social capital is the subject of further study. Here we give some first results to illustrate the connection between these scales and other individual characteristics. The four scales are hardly correlated with the usual socio-demographic characteristics, except that subscale I is correlated with the level of education. This implies that these measurements of social capital give information that is not already included in more basic variables. Network size and network variety correlate positively with the four subscales, most strongly with subscale I. The fraction of network members met through work-related activities correlates positively with subscales I and IV, not or hardly with subscale II, subscale III, and the sum-score of all 35 items. The three measures that can be calculated from Lin and Dumin's (1986) Position Generator, viz., highest accessed prestige, range of prestige, and number of positions accessed, correlate rather strongly with subscale I, but weakly with subscales II to IV. This is in accordance with the content of the items in subscale I, and it suggests that subscales II to IV provide measurements of aspects of social capital that are not directly

covered by the Position Generator.

CONCLUSION

In this contribution, we have aimed to come to a viable theory-driven empirical approach to measuring individual social capital. It was argued that, to measure general social capital, it is important to recognize different sub-dimensions of social capital, and that an efficient procedure to measure social capital may be obtained through an approach called the Resource Generator, which is based on questionnaire items asking about access to specific social resources without asking who are the individual network members giving access to these resources. In a list of 35 Resource Generator items used in a representative survey of the Dutch population, four meaningful subscales were found that were internally homogeneous and mutually only weakly correlated. One subscale correlates rather strongly with Lin and Dumin's (1986) Position Generator, supporting the idea that access to more and more prestigious positions also provides access to more social resources; the other subscales can be regarded as distinct elements of social capital. These results provide empirical support for the importance of recognizing multiple sub-dimensions of social capital.

This approach is elaborated further in the project 'Measurement of individual social capital', incorporated within the SCALE research program, in which also comparisons are made between approaches using the Name Generator / interpreter, the Position Generator, and the Resource Generator. Of each of these measurement techniques, validity, reliability,

parsimony, and efficiency are considered. In addition, the distribution and structure of social capital of the general Dutch population is considered, including its distribution over geographical regions and social subgroups, and the correlations between sub-collections of social capital, and personal resource collections of individuals. A later step will be to use these measurement scales of social capital as independent variables in explanatory studies of individual goal achievement.

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	Fields			Support types						act.	univ. res.			other		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
“Do you know anyone who...”																
1 can repair a car, bike, etc.	*		*			*				*						*
2 owns a car	*		*			*				*		*				
3 is handy repairing household equipment	*		*			*				*						*
4 can speak and write a foreign language				*		*				*						*
5 can work with a PC			*	*		*				*						*
6 can play an instrument			*			*				*					*	*
7 has knowledge of literature			*			*	*			*						*
8 has graduated from senior high school	*	*	*	*	*	*	*			*						*
9 has a higher vocational education	*	*	*	*	*	*	*			*						*
10 reads a professional journal			*	*		*	*			*					*	*
11 is active in a political party				*	*	*				*		*	*			*
12 owns shares for at least Dfl.10,000	*			*		*				*		*		*		
13 works at the town hall					*	*				*		*				
14 earns more than Dfl.5,000 monthly	*	*	*	*	*	*				*		*				
15 owns a holiday home abroad			*			*				*		*				
16 is sometimes in the opportunity to contract people	*			*		*				*		*	*			*
17 knows a lot about governmental regulations	*				*	*	*			*						*
18 has good contacts with media				*	*	*				*		*	*	*		*
19 knows about soccer		*	*			*	*			*						*
20 has knowledge about financial matters	*			*	*	*	*			*		*			*	
21 can find a holiday job for a family member	*					*	*			*	*					
22 can give advice on conflicts at work				*		*	*	*		*	*					*
23 can help when moving house (packing, lifting)	*					*				*						
24 can help with small jobs around the house	*					*				*						*
25 can do your shopping when you are ill	*					*				*	*					
26 can give medical advice when you are dissatisfied	*					*	*	*		*	*					*
27 can borrow you a large sum of money	*					*				*		*				
28 can accommodate you (for a week)	*					*		*		*	*					
29 can give advice about conflicts with family	*	*				*	*	*		*	*					
30 can discuss with you what political party to vote					*	*	*			*						*
31 can give advice on matters of law	*			*	*	*	*			*	*					
32 can give a good reference when applying for job				*		*				*	*					
33 can baby-sit for your children	*	*	*	*	*	*		*		*	*					
34 can be talked to regarding important matters	*	*	*					*			*					
35 can be visited socially		*	*						*		*					

Table 9.1: Set of Resource Generator Items Covering Several Theoretical Classifications

Source: *Social Survey of the Dutch 199-2000,1* (SSND1). Columns refer to the following theories and classifications: 1-5: Fields of goal attainment in Social Production Function Theory (Van Bruggen 2001): private (1), social (2), recreation (3), work (4), citizenship (5). 6-9: Usual categories of social support: instrumental (6), information (7), emotional support (8), social company (9). 10-11: Types of actions involved with social capital (Lin 1999b, 2001): instrumental (10), expressive (11). 12-14: Universally valued resources (Lin 1982): wealth (12), power (13), status (14). 15-16: Other categories of personal resources: human capital (15), cultural capital (16). A Dutch guilder (Dfl.) is worth approximately half a dollar or Euro.

Table 9.2: Subscales of Social Capital Produced by Mokken Scale Analysis, with Loevinger *H* coefficients for Subscales and Items, and With Reliability Coefficients (ρ).

<i>scale #</i>	<i>H</i>	<i>rho</i>	<i>Item # "do you know anyone who.."</i>	<i>Item H</i>
I	.48	.68	18 has good contacts with media	.36
			15 owns a holiday home abroad	.43
			7 has knowledge of literature	.46
			14 earns more than Dfl.5,000 monthly	.46
			8 has graduated from senior high school	.56
			9 has a higher vocational education	.82
II	.47	.54	11 is active in a political party	.44
			17 knows a lot about governmental regulations	.47
			20 has knowledge about financial matters	.48
III	.48	.70	10 reads a professional journal	.46
			2 owns a car	.45
			4 can speak and write a foreign language	.45
			5 can work with a PC	.55
IV	.40	.61	32 can give a good reference when applying for a job	.42
			22 can give advice on conflicts at work	.42
			29 can give advice about conflicts with family members	.34
			23 can help when moving house (packing, lifting)	.45

Source: *Social Survey of the Dutch 1999-2000*