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The impact of social and human capital on the income attainment of Dutch managers

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This article discusses the interplay between social and human capital in the income attainment process of managers. A multivariate analysis of a 1986/1987 sample of 1359 top managers of larger companies in the Netherlands indicates that top managers find their jobs largely through informal channels and more so if they possess more social capital. Social capital (external work contacts, memberships) has a substantial independent influence on income, net of human capital (education, experience) and position level (number of subordinates). Human and social capital can act as substitutes for each other. Human and social capital interact in the income attainment process, but not as expected. Social capital helps at any level of human capital, but human capital does not make a difference at the highest levels of social capital.

1. Introduction: The problem at hand

At the crossroads of stratification and social network research, there is an ongoing discussion and research effort on the importance of social networks in the distribution of life chances (Lin, Vaughn, and Ensel 1981; Bridges and Villemez 1986; Marsden and Hurlbert 1988; De Graaf and Flap 1988). According to the received view in sociology (e.g.,

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status attainment research) and economics (e.g., human capital theory) and confirmed by many a research report, level of education, or more generally conceived, human capital, is the critical factor in determining life chances in western industrial societies. The outcome of the discussion on social networks and stratification is that social networks are also important to people's life chances, including their chances on the labor market. Personal networks can be thought of as a resource, as a means to one's ends, as a kind of capital.

Stated more precisely, someone's personal network and all the resources a person has access to through this network, can be interpreted as his social capital (Bourdieu 1980; Lin 1982; Flap 1988; Coleman 1988). Social capital is a combination of the number of people who can be expected to provide support, and the resources those people have at their disposal. It is a means of production, that produces better conditions of life. Campbell, Marsden, and Hurlbert (1986) call this the "network-as-resources" argument: people will enjoy a better life if they dispose of more and better social resources.

In this paper we want to inquire into the relationships between human capital, social capital, and income. Our hypotheses will be tested with a data-set on the occupational life of managers of Dutch firms. We use this data-set to explore the relative importance of human and social capital as determinants for differences in income attainment, and to disentangle the effects of these different types of capital in the income attainment process.

2. Careers of managers and theories of social and human capital: Hypotheses

Human capital theory has yielded a sizeable number of hypotheses with regard to the functioning of the labor market (Blaug 1980). The notion of social capital is also rich in implications, inter alia, with regard to labor market phenomena. Once a personal network is conceptualized as someone's social capital, a number of hypotheses follow.

With respect to the job-finding process, the notion of social capital leads us to the hypothesis that if persons are equipped with social capital they will use it, e.g., in trying to obtain a job, and that those who are better equipped with social capital will more frequently employ informal channels to find their job.
Since resources usually can be utilized to produce other kinds of resources as well, individuals with more education can be expected to herewith produce social capital. This probably also goes for work experience, another aspect of human capital. According to Granovetter (1988: 193): "The meaning of individuals' history of mobility is inadequately captured by human capital arguments. As one moves through a sequence of jobs, one acquires not only human capital but also (...) a series of co-workers who necessarily become aware of one's capabilities and personality." With a variation on the title of one of James Coleman's recent publications (Coleman 1988) one could express this idea as follows: human capital produces social capital.

If this argument is acceptable, another near-lying idea takes hold. Social capital acts as a substitute for human capital in the occupational career. Or put differently: social capital has an independent effect on income.

Another hypothesis, akin to the former argument, can be taken from Bourdieu and Coleman. According to them social capital multiplies revenues of human capital, i.e., there is an interaction term between human and social capital in the production of income. Or in the words of Bourdieu: "le capital social peut multiplier le rendement du capital économique et du capital culturel" (Bourdieu and De Saint Martin 1978: 28). Coleman (1988) uses a similar argument when he demonstrates that parents with more social capital provide their children with better educational opportunities.

The emerging research on the influence of social capital in the socio-economic life cycle can be scrutinized in at least two respects. First, the measurement of social capital can be refined. Until now, the job-status of contact persons who acted as go-betweens was used as an indicator of the total volume of social capital (cf. Lin and Dumin 1986). A more direct measurement of this total volume would be a valuable addition to existing research. Secondly, it is important to note, that research on the relationship between social resources and occupational attainment until now has been mainly concentrated on occupational status as a dependent variable. Extension to the prime indicator of occupational success, income attainment, is welcome (cf. Bridges and Villemez 1986; Marsden and Hurlbert 1988). In this paper we set out to explore these two modifications.

The remainder of this contribution is organized as follows. We start with a description of our data on Dutch top managers, and we present
the operational definitions of the variables which will be utilized in the analysis. Next, we describe the job-finding process of the managers, specifically how frequently the managers in our sample found their current job through informal relations. We inquire whether there is an influence of social capital on the job-finding method: do those managers with more social capital more frequently employ this method to acquire their job? In addition, we shortly shall address the question of the presumed special role of weak ties in the job search process (Granovetter 1974).

Further, it is established whether social capital affects the income attainment process net of the effect of human capital. Subsequently, we deal with the question as to the relative contribution of human capital and social capital in explaining differences in incomes among managers of larger companies. In the following step we examine the extent to which human and social capital represent alternative means to the same goal, i.e., acquiring a good income. Can they be substituted for each other? Does social capital multiply the returns on human capital, or put differently, is there an interaction effect? As a last step in our analysis we make an effort to explore the influence of the institutional context in which the income attainment process takes place, by controlling for establishment size and market sector. Finally, we end our argument by summarizing the main conclusions of our analysis and discuss some of the questions which were left unanswered.

3. Data and operational definitions

a. Data

Our data-set on top managers is quite unique. Data available in the public domain on recruitment of managers and their ensuing careers is scanty. To our knowledge there is no other sample available on labor market behavior of top managers which includes multiple indicators of both human and social capital.

The data originate from a research project which was designated to investigate the labor market behavior and the labor market orientation of Dutch managers (Boxman 1987). The actual research, a survey conducted in 1986–1987 among high level managers of 4000 companies in the Netherlands, resulted in a sample of 1402 respondents. The
research design was cross-sectional. A standard questionnaire was sent to these 4000 larger companies, i.e., with 50 or more employees. These companies were randomly selected from the total population of 8746 Dutch larger companies. On the packets which were sent to these companies, each containing one questionnaire, we printed above the address of the company one out of five specific job titles of managers. We included titles of five broad categories of important decision maker functions in Dutch companies: Managing Director, Manager Human Resources and Organization, Sales Manager, Manager Purchase, and

Table 1
Group specific differences in the use of social contacts for getting a job; Data: Labor Market Behavior and Orientation of Dutch Managers 1987, \( n = 1359 \)

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Per cent use of social contacts</th>
<th>Per cent use of 'weak ties' (percentage of the number using social contacts)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>51</td>
<td>67% (34)</td>
<td>94% (32)</td>
</tr>
<tr>
<td>Men</td>
<td>1304</td>
<td>60% (787)</td>
<td>88% (694)</td>
</tr>
<tr>
<td></td>
<td>1355</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Function:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managing director</td>
<td>522</td>
<td>71% (373) **</td>
<td>84% (314) *</td>
</tr>
<tr>
<td>Personnel manager</td>
<td>227</td>
<td>61% (139)</td>
<td>94% (131)</td>
</tr>
<tr>
<td>Commercial manager</td>
<td>167</td>
<td>57% (96)</td>
<td>89% (85)</td>
</tr>
<tr>
<td>Manager production/ automation</td>
<td>104</td>
<td>57% (59)</td>
<td>90% (53)</td>
</tr>
<tr>
<td>Financial manager</td>
<td>272</td>
<td>45% (123)</td>
<td>93% (114)</td>
</tr>
<tr>
<td>Middle management</td>
<td>67</td>
<td>52% (35)</td>
<td>91% (32)</td>
</tr>
<tr>
<td></td>
<td>1359</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formal education:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary/Low vocational</td>
<td>18</td>
<td>72% (13) **</td>
<td>69% (9) **</td>
</tr>
<tr>
<td>Extended primary</td>
<td>112</td>
<td>59% (66)</td>
<td>82% (54)</td>
</tr>
<tr>
<td>Middle vocational/ Grammar</td>
<td>372</td>
<td>65% (243)</td>
<td>83% (202)</td>
</tr>
<tr>
<td>Higher vocational</td>
<td>609</td>
<td>54% (330)</td>
<td>92% (302)</td>
</tr>
<tr>
<td>University</td>
<td>248</td>
<td>70% (173)</td>
<td>94% (162)</td>
</tr>
<tr>
<td></td>
<td>1359</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total group:</strong></td>
<td>1359</td>
<td>61% (825)</td>
<td>88% (729)</td>
</tr>
</tbody>
</table>

Significance of the Chi-square test on the observed differences: ** \(< 0.01; * \(< 0.05.\)
Financial Manager. For each category we mailed 800 letters. In the letter of introduction we requested whether, in case the particular company did not have the function mentioned in the address, the questionnaire would be completed by the Manager Production/Automation or the Managing Director. Since in some firms a manager with a middle management function filled in the questionnaire, these managers were classified in an additional category. So, in the data-set there are seven managerial categories. In the analysis we will use the following six categories: Managing Director; Manager Human Resources and Organization; Commercial Manager (Purchase/Sales); Manager Production/Automation; Financial Manager and the category of managers with a middle management function (for the number of cases in each category see Table 1). The response-rate of the project was 35.2% (n = 1402). Because of missing information and applying list-wise deletion the number of respondents used in the analysis is 1359. Our final sample contains 38.4% managing directors, 16.7% managers human resources and organization; 12.3% commercial managers; 7.7% managers production/automation; 20.0% financial managers, and 4.9% middle managers. The lion's share of our sample (96.2%) is formed by males.

The non-response rate is rather high. We have no indications about the problems this non-response might cause, as data on managers is scarce indeed. We suspect that managers of larger companies are over-represented in our sample because some management functions, like manager human resources and organization, do not always occur in smaller companies. We cannot exactly determine whether this is the case, because we only have information on the size of the establishment our respondents are working in, whereas population figures relate to total company size, over all establishments. Based on information on the whole sample of companies with more than 50 employees we know that 65% are working in companies with more than 100 employees. 55% of our respondents are working in establishments with 100 or more employees. This is what can be expected, because it is possible to have large companies with small establishments, but not the other way round. However, we still cannot be sure if there is a real oversampling of managers in large companies. As a control we shall split the sample into managers working in larger establishments and those working in smaller ones, and perform some additional analyses on these sub-samples to decide whether our empirical results might be due to an over-representation of companies with larger establishments.
b. Measurements

The key concepts in our theoretical arguments are operationally defined as follows:

The *job-finding* method is classified in two categories, according to the channel through which the current job was attained: 1. Informal contacts (via relatives, colleagues, and acquaintances, or directly contacted by the employer or headhunter); 2. Formal channels (through advertisements or employment agencies). Of the three categories that are usually employed in labor market research: formal, informal, and direct application, the latter one was unfortunately not included as a separate category. ¹

The *strength of tie with a contact person* is a crucial variable in the literature on the relationship between networks and job finding. Strong ties are indicated by contacts with relatives, and weak ties are indicated by contacts with a colleague, an acquaintance, or the employer.

*Human capital* is measured by three indicators. Formal education is measured by the total years of education, work experience by the number of years after school, and the number of former jobs is measured straightforwardly.

For the measurement of *social capital* we devised two indicators. The first indicator, work contacts, is a scale, based on the frequencies of contacts with people in other organizations, particularly contacts with people of the same level of education, the same function and with people with many subordinates. The scale was constructed following a Mokken-Scale procedure, a program for one-dimensional scale construction (see Niemöller, Van Schuur, and Stokman 1980). The second indicator is formed by the number of memberships of elite clubs, like Rotary or Lions, and of professional associations. This indicator has five categories, ranging from no memberships to four or more memberships.

*Income* is indicated by gross yearly income in Dutch guilders (fringe benefits included), with the following categories: less then Fl 50,000; Fl 50,000–Fl 70,000; Fl 70,000–Fl 100,000; Fl 100,000–Fl 150,000;

¹ In his study on the job-finding process of professional, technical, and managerial workers, Granovetter (1974: 19) reports that 14.8% of those who fell in the managerial occupational category (there were only 81 managers included in a total sample of 282) succeeded in finding their current job through direct application. For a discussion of the difficulties with the coding of 'direct application', see Granovetter (1974: 154–156).
more than FL 150,000. In the analysis we used the natural logarithm of the average category-income in order to create a normal distribution.

Position level is a measure of the position a manager has reached within the organization, which we computed as the natural logarithm of the number of a manager’s direct and indirect subordinates. Although other indicators of function level are present, e.g., job titles, like ‘managing director’ or ‘commercial manager’, we prefer this indicator, because it corrects for the size of the firm involved. A director of a firm of 100 employees now is scored in the same category as a commercial manager with 100 employees to supervise.

Means, standard deviations, and measures of skewness of and correlation coefficients between all variables used in the ensuing causal models are listed in the Appendix. Except for the variable ‘number of functions’, which is considerably skewed, all variables are quite normally distributed. The Appendix first displays the information for the total sample, and next for four sub-samples according to level of social capital.

4. Analysis

Before we start with determining the relative contribution of social capital in the income attainment process, we will describe the channels which managers used to obtain their present jobs. First, we will ascertain whether managers with more social capital did indeed acquire their current job more frequently through informal relations. If someone has resources at his or her disposal he or she will generally use these resources. And as Lin and Dumin state (1986: 365), the theory on social resources posits that access to and use of social resources affects the success of instrumental action, e.g., in finding a job. Previous studies on the job-finding process have demonstrated the importance of social networks, but they focused on ties that were actually activated in finding a job without much attention to the total volume of social capital. Although our data-set does not contain detailed information on the contact person, it enables us to address the question of access and use of social networks in instrumental action.

Table 1 informs us that most managers in our sample acquired their job through informal means (61%). They were informed by a family member, an acquaintance, or a colleague, or they were approached
directly by the present employer. This finding for a well-defined group of high status occupations runs counter to a persistent finding in general surveys of a negative association between job-level and use of informal job-finding methods: individuals from lower occupational groups more frequently find their job through informal ways than those at higher levels of the occupational distribution (Marsden and Hurlbert 1988; De Graaf and Flap 1988). However, there are also some indications from research undertaken in the United States and in West-Germany (Granovetter 1974; Smelser and Content 1980; Preissendörfer and Voss 1988) that persons working in the highest occupations frequently rely on informal relations. If both findings are valid, this would result in an U-shaped association between social class and method of job-finding for the total population. In general social surveys this relationship probably is masked because of the small number of respondents belonging to higher strata included in these surveys. Our research lends further credence to the suggestion of an U-shaped association of class and job-finding method.

No significant differences appear between male and female managers in the way in which they acquired their present position. Managers with more human capital in the form of education, arrived at their present position with a significant higher frequency through some kind of informal channel, while managers with a middle or high vocational training or just grammar school made use of informal contacts somewhat less. At the bottom of the educational distribution, informal means again become prominent. The higher the position managers occupy within their organization, the more likely social relations did provide the match between the candidate and the job-opening: 52% in middle management, increasing to 71% for directing managers.

As an aside, we did inquire whether our data support Granovetter’s weak-tie argument (Granovetter 1974). Weak ties indeed proved to be the most important way through which managers did find their present job, especially for managers at higher levels of education. More than half of the managers in our sample, 88% of those who used some type of informal relation, arrived at their job through some kind of weak tie.*

Although we do not follow up this argument any further, it proves to be the case that managers who did find their job through informal social relations do earn a higher income (\( \tau_c = 0.15; p < 0.01 \)). Another element of Granovetter’s weak-tie argument (Granovetter 1974) was refuted by our data: there is no relationship whatsoever between strength of the tie to the contact person and income level (\( \tau_c = 0.03; \text{n.s.} \)).
Table 2
Proportion of managers finding a job through social contacts by two indicators of social resources; Data: Labor Market Behavior and Orientation of Dutch Managers 1987, n = 1359

<table>
<thead>
<tr>
<th>Work contacts with managers in other organizations</th>
<th>Per cent informal</th>
<th>Number valid cases</th>
<th>F-test (sign.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. None</td>
<td>54.6%</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>2. Very few</td>
<td>55.4%</td>
<td>276</td>
<td></td>
</tr>
<tr>
<td>3. Moderate</td>
<td>67.9%</td>
<td>274</td>
<td></td>
</tr>
<tr>
<td>4. Many</td>
<td>65.0%</td>
<td>546</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memberships of clubs, professional organizations, etc.</th>
<th>Per cent informal</th>
<th>Number valid cases</th>
<th>F-test (sign.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. None</td>
<td>63.3%</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>2. One</td>
<td>54.9%</td>
<td>446</td>
<td></td>
</tr>
<tr>
<td>3. Two</td>
<td>63.8%</td>
<td>423</td>
<td></td>
</tr>
<tr>
<td>4. Three</td>
<td>66.3%</td>
<td>252</td>
<td></td>
</tr>
<tr>
<td>5. Four or more</td>
<td>71.3%</td>
<td>87</td>
<td></td>
</tr>
</tbody>
</table>

Now we shall go into the question with regard to the job-finding process whether social capital affects the way in which the present job is found. This represents a preliminary test of the network-as-resources argument. Table 2 shows that managers entertaining moderate or many work-contacts with colleagues in other organizations more often reached their current position through informal channels. The same relationship can be observed for managers with relatively many memberships in clubs and associations. Although the differences are not very large—there are only ten percent differences between the extreme categories—they are statistically significant. Thus, the network-as-resources argument is not refuted and we can have confidence in our two indicators of social capital.

The second question to be answered concerns the assessment of the independent effect of social capital in the income attainment process net of human capital and job characteristics.

To take full advantage of the fact that our data-set includes multiple indicators for critical variables we employ linear structural (LISREL)
Fig. 1. Base-line model (deviance = 3.71, df = 5) (standardized coefficients).

models (Jöreskog and Sörbom 1986). The indirect effects, as well as the relative contribution of both sorts of capital in the explanation of differences in income, and the total variance explained by social and human capital can be better assessed with linear structural models than with Ordinary Least Squares regressions. LISREL has the additional advantage of the simultaneous estimation of both measurement and structural models. All covariance matrices which are used in the coming LISREL-analysis can be found in the Appendix.

Figure 1 depicts our baseline linear structural model. Schooling, work experience, and number of functions within the same company are the indicators of human capital, and the amounts of work contacts and memberships are the indicators for social capital. The measurement models for human capital and social capital have different designs. Social capital is measured with a factor model, whereas human capital is measured in a MIMIC (multiple indicators, multiple causes) model. We did not use the more traditional factor analytical approach for the measurement model of human capital, because the indicators of human capital are not (logically) associated. It is even plausible that because of growing educational enrollments, schooling, measured as the length of the educational career, and work experience, measured as the length of the occupational career, are not at all or negatively associated, which would damage the construction of a factor model severely. The indicators of social capital may be hypothesized to be correlated positively.
The structural part of the model is straightforward: human capital predicts social capital, whereas both human and social capital are hypothesized to affect income attainment. The crucial test of the "network-as-resources" argument, of course, is in the direct effect of social capital (net of the effect of human capital) on income.

Figure 1 presents the standardized coefficients of the baseline model. The coefficients of the measurement models show that the major indicator of human capital is schooling, but experience and the number of former functions also have their own direct effects. Social capital has its most important indicator in the number of work contacts, and the number of memberships in clubs and associations performs a minor role. The coefficients in the structural models (which are path coefficients) display that social capital is predicted to some extent by human capital: people with more human capital also have more social capital at their disposal. The proportion of explained variance in social capital is about 10%. More important is the observation that both human and social capital have direct effects on income. The effect sizes are balanced: human capital has an effect of 0.34, and social capital an effect of 0.36.

We cannot rely completely on this demonstration of the importance of social capital as a resource variable in the careers of managers. We have to be cautious because of our cross-sectional research design. Social capital, human capital, and income are measured in the same period of the managers' careers. It may be objected that the volume of social capital varies over careers, and therefore, the relationship between social capital and income may not be due to a direct effect of social capital on income. An alternative explanation of this association may be found in a mutual dependence on the attained position of the managers. When the careers of managers proceed, they might gain social capital and income simultaneously when they rise to higher levels within their companies. Although such an alternative explanation can never be conclusively falsified in a cross-sectional design, we want to elaborate on this. Therefore, we will test alternative models which make our understanding of the underlying process, i.e., there is a direct effect of social capital within the income attainment process of managers, more plausible.

We add to the model the position level of a manager as indicated by the logarithm of the number of subordinates he or she supervises as an assurance that social capital is not just a reflection of a manager's
position within his or her organization. This extended model is given in Figure 2, where position is placed between human capital on the one hand and income on the other.

The extended model was estimated first without modelling the relationship between position and social capital. Human capital was supposed to affect position, social capital, and income, and the model included direct effects of position and social capital on income. This model did not fit the data very well (a likelihood ratio of 91.9 with 9 degrees of freedom); the main reason proved to be the absence of a parameter modelling the association between position and social capital. Because the causal direction of this association is far from clear—on the one hand there are good reasons to surmise that a higher position brings more social resources, but on the other hand, there are also good reasons to assume that social resources will help in improving one’s position—, we introduced a correlation of the error variances in position and social capital. This additional parameter strongly affected the model fit: the likelihood ratio dropped to 21.5, with 8 degrees of freedom, which can be regarded as a satisfactory fit with this

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3 This was done by letting one off-diagonal coefficient in the PS-matrix free in the LISREL-model. Introduction of one causal effect between position and social capital, in whatever direction, resulted in the same likelihood ratio and the same number of degrees of freedom. Also, in these models, the effects on income of all three predictor variables are equal to the effects reported in the model of Figure 1.
number of cases. The difference to the former model is large—one degree of freedom brings a decrease in the likelihood ratio of 70.4 points—which implies that the association between a manager's position and his social capital is much larger than predicted by human capital.

Figure 2 again includes the standardized coefficients. The effect of social capital does not decrease dramatically: it was 0.36 in the baseline model, and now it is 0.24. The number of social contacts managers have and the number of their memberships, still predict their income to a fair amount. The direct effect of human capital on income now is 0.28, which also is comparable to the effect of 0.34 in the baseline model. Very plausibly, the position itself exerts the largest effect on income; when standardized its effect is 0.37. The results reported for the extended model do support our social capital argument. Both the effects of human capital and social capital indicators suffer under the large effect size (0.41) of position level, but remain substantial. When the position a manager occupies is accounted for in the causal model, social capital still proves to have a direct effect on income. Managers with more social resources tend to have higher incomes, even when their larger human resources and higher positions are controlled for. The proportion explained variance now increases strongly (from 32.4% to 43.5%), indicating the important contribution of position level in the income attainment process, which of course is no surprise.

Now we proceed with the third question, whether there are interaction effects of human capital and social capital in the income attainment process. As we have seen, Bourdieu and Coleman have forwarded a hypothesis that human capital is best rewarded for those who have the best social networks, who have the largest social capital. To test this hypothesis, we have divided our sample of Dutch managers in four sub-samples, according to the size of social capital managers have. We computed the factor scores on social capital for all managers, and divided the resulting scale in four in size comparable groups (339 with hardly any social capital, and than 420, 304, and 296 managers with increasing amounts of social capital). We employed the covariance matrices of these four sub-samples, which are displayed in the Appendix, to estimate the interaction model of Figure 3, which is a restricted version of the extended model. In the interaction model social capital is removed, and the relation between human capital and income will be estimated for each level of social capital separately. The crucial test for
the interaction thesis is in parameters BE(2,1) and BE(3,1). When these effects are equal over the subgroups, the interaction hypothesis is rejected, and when they are larger for managers with larger amounts of social capital, it is supported in our data. The submodels are estimated and compared within the LISREL framework, applying the group comparison device.

Panel A of Table 3 presents some models and contrasts between models, with their likelihood ratios and numbers of degrees of freedom. Model 1 of Table 3 shows the model in which none of the 12 structural effects (three times four BE-parameters for the four social capital groups) are due to constraints. This model has a likelihood ratio of 20.37 with 14 degrees of freedom. This model is altered by constraining the effects of position on income (the BE(3,2)s) to be equal over social capital groups. The data support this constraint, as indicated by the contrast between models 1 and 2, which is statistically insignificant, so we prefer the more parsimonious model 2. The following models 3 and 4 show that no equality constraints hold for BE(2,1) and BE(3,1). Models 3 and 4, in which the hypothesis that BE(2,1) and BE(3,1), respectively, are equal over groups, have both to be rejected based on our data. The effects of human capital on both position and income indeed do vary over the four groups, and, apparently, there is an interaction effect between human capital and social capital on rewards for Dutch managers.

Panel B of Table 3 contains the unstandardized coefficients of the interaction model. They show that the interaction effect is the other way round as expected by Bourdieu and Coleman. The effects of human capital are highest for managers who are practically without social resources, and smallest for managers with many social resources.
Table 3
Tests for interaction patterns between human and social capital in the income attainment process of managers: Likelihood statistics, degrees of freedom, and contrasts of selected linear structural models for group comparison, Data Labor Market Behavior and Orientation of Dutch Managers 1987, n = 1359

<table>
<thead>
<tr>
<th>No. Model</th>
<th>Deviance</th>
<th>ndf</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel A: models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1) BE(2,1), BE(3,1) and BE(3,2) unequal over groups</td>
<td>20.37</td>
<td>14</td>
</tr>
<tr>
<td>(2) BE(2,1), BE(3,1) unequal, and BE(3,2) equal over groups</td>
<td>23.21</td>
<td>17</td>
</tr>
<tr>
<td>(3) BE(3,1) unequal, and BE(2,1), BE(3,2) equal over groups</td>
<td>31.41</td>
<td>20</td>
</tr>
<tr>
<td>(4) BE(2,1) unequal, and BE(3,1), BE(3,2) equal over groups</td>
<td>31.92</td>
<td>20</td>
</tr>
<tr>
<td>(5) Contrast (2) and (1)</td>
<td>2.84</td>
<td>3</td>
</tr>
<tr>
<td>(6) Contrast (3) and (2)</td>
<td>8.20</td>
<td>3</td>
</tr>
<tr>
<td>(7) Contrast (4) and (2)</td>
<td>8.71</td>
<td>3</td>
</tr>
</tbody>
</table>

Panel B: selected unstandardized coefficients (and standard errors) of model 2

<table>
<thead>
<tr>
<th>Social capital</th>
<th>Low (1)</th>
<th>(2)</th>
<th>High (3)(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BE(2,1) human capital—position</td>
<td>0.154</td>
<td>0.109</td>
<td>0.1640.047</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.028)</td>
<td>(0.032)(0.034)</td>
</tr>
<tr>
<td>BE(3,1) human capital—income</td>
<td>0.050</td>
<td>0.046</td>
<td>0.0400.027</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)(0.006)</td>
</tr>
<tr>
<td>BE(3,2) position—income</td>
<td>0.095</td>
<td>0.095</td>
<td>0.0950.095</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.005)</td>
<td>(0.005)(0.005)</td>
</tr>
</tbody>
</table>

Especially, the group of managers with the largest individual social resources seems to find no returns on their human capital. The direct effect of human capital on income decreases monotonically when social capital increases, from 0.050 for the managers with the smallest volume of social capital to 0.027 for the managers with the largest volume of social capital. With regard to the direct effect of human capital on position level the trend is not that clear. Although the effect is apparently the lowest for the managers with the largest volume of social resources, it fluctuates irregularly for the other three groups.

In order to make the results of the foregoing analysis accessible in a way that the interaction effects can be spotted easily with the eye, we
Table 4

Average gross yearly income in Dutch guilders \((\times 1000)\) by social capital and formal education;
Data: Labor Market Behavior and Orientation of Dutch Managers 1987, \(n = 1359\)

<table>
<thead>
<tr>
<th>Formal education</th>
<th>Social capital</th>
<th>Low (1)</th>
<th>(2)</th>
<th>(3)</th>
<th>High (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Primary/Low vocational</td>
<td>Low (1)</td>
<td>73</td>
<td>86</td>
<td>88</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>((n = 45))</td>
<td>((n = 41))</td>
<td>((n = 26))</td>
<td>((n = 18))</td>
<td></td>
</tr>
<tr>
<td>2. Extended primary, Middle vocational, Grammar</td>
<td>Low (1)</td>
<td>81</td>
<td>100</td>
<td>104</td>
<td>114</td>
</tr>
<tr>
<td></td>
<td>((n = 110))</td>
<td>((n = 107))</td>
<td>((n = 80))</td>
<td>((n = 75))</td>
<td></td>
</tr>
<tr>
<td>3. Higher vocational</td>
<td>Low (1)</td>
<td>91</td>
<td>99</td>
<td>104</td>
<td>117</td>
</tr>
<tr>
<td></td>
<td>((n = 140))</td>
<td>((n = 206))</td>
<td>((n = 127))</td>
<td>((n = 136))</td>
<td></td>
</tr>
<tr>
<td>4. University</td>
<td>Low (1)</td>
<td>108</td>
<td>132</td>
<td>132</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>((n = 44))</td>
<td>((n = 66))</td>
<td>((n = 71))</td>
<td>((n = 67))</td>
<td></td>
</tr>
</tbody>
</table>

present a three-way table in which income is broken down by human capital and social capital.

Table 4 presents average yearly incomes of managers in particular categories of human and social capital. As can be seen in the successive columns of Table 4, returns on human capital in terms of income decrease when social capital increases. This is especially the case for managers with the most social capital. The difference in mean yearly income between managers with only primary education and those with university education is smallest for the managers with the largest social capital. Looking at successive rows of the table shows that the returns on social capital are about equal for all educational categories. 4

Although the discussion has not yet resulted in a list of clear-cut hypotheses (see, e.g., the discussion between Williamson 1981 and Granovetter 1985) and although empirical research has hardly begun (Beck and Colclough 1988, Marsden and Campbell 1990), it is plausible that the context, like the market sector, or the firm size, affects the productivity of either human or social capital. Transaction costs might be higher in market sectors where repeated transactions between the same partners occur relatively often, or where team production or agency problems lead to metering problems. These conditions call for the development of social relations, lest the production become ineffi-

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4 When human capital is indicated by years of work experience, one finds basically the same pattern, although a little less clearly: social capital helps on any level of human capital, and human capital does not help on the highest levels of social capital.
cient. As a rough guess transaction costs could be higher in the service as compared to the manufacturing sector, and in larger establishments than in smaller ones.

As a preliminary test of these institutional effects, we first divided our sample of managers in two subgroups according to market sector, making a difference between those employed in the manufacturing and service sectors. Second, and also as a control for the effects of possible oversampling of larger companies, we performed additional analyses on subgroups of managers working in larger and in smaller establishments, i.e., with more or less than 100 employees. Applying again a subgroup LISREL model, we were able to test whether the structural parameters of the income attainment process are significantly different for different institutional settings.

For each sub-analysis, we estimated both the baseline and the extended model twice, first under the assumption of equal structural coefficients for the subsamples and secondly, under the assumption of unequal beta coefficients, which in both cases did not lead to a significant difference. For these different kinds of institutional contexts no differences can be found. The income attainment process appears to be similar for managers in the manufacturing and in the service sector, which also appears to be the case for larger and smaller establishments. This last finding indicates as well, that our sample does not suffer from an oversampling of managers from large companies. Of course, these divisions of the labor market need further elaboration to ascertain that human and social capital play comparable roles in different sectors of the labor market.

5. Conclusions and discussion

Summarizing our analysis we draw some tentative conclusions. As to the fruitfulness of the notion of social capital in stratification and social network research: the results of our analysis on the determinants

5 The contrast of the baseline model estimated with different betas for different market sectors as compared to the baseline model estimated with equal betas, results in a likelihood of 2.09 for 3 degrees of freedom. The corresponding result for the extended model is 7.02 with 5 degrees of freedom. Both contrasts are not significant. When comparing structural coefficient for small and large establishment sizes, we find contrast of 2.12 with 3 degrees of freedom for the baseline model, and 1.64 with 5 degrees of freedom for the extended model, again not significant.
of the occupational incomes of managers corroborate the social capital theory in a number of ways.

Dutch managers not only find their jobs very frequently through informal relations, they do so even more frequently, if they dispose of more social capital. In general, there is a rather large direct effect of social capital on income. Social capital adds to, rather than replaces, human capital in the income attainment process of managers. Furthermore, human capital produces social capital, although this 'productivity' is not very strong. Human capital and social capital interact in the income attainment process, but the hypothesis, that social capital multiplies the returns on human capital, is refuted. On the contrary, the returns on human capital decrease if managers are equipped with a larger volume of social capital. The returns on human capital are largest on the lowest levels of social capital.

A weakness in our analysis stems from our cross-sectional design. A cross-sectional data-set does not allow the causal sequence to be determined exactly, especially between the theoretically relevant variables, position level within an organization and social capital. Although our analysis established an association between social capital and income, it still can be objected that social capital does not produce a higher income, because their association might be due to a mutual dependence on attained position of the managers, that the manager's position entails both a high volume of social capital and a high income. With a longitudinal design it would be much easier to establish the causal order. However, when position level within an organization is controlled for, the influence of social capital on income only slightly diminishes.

Future efforts should concentrate on the question as to the mechanism between social capital and the returns on social capital. There are many ways in which social connections could provide advantages which result in a higher income, and not just only at the moment of job-finding. Is it scarce information on the particular market the company is working on, or is it learning by good and bad examples offered by other managers in other companies? Or do we have to look at the recruitment process? How do employers recruit managers? Do they 'buy' managers who are rich in social connections? Burt and Ronchi (1990) argue that social capital amassed in the employees of a company is among the most valuable productive assets of such a company, alongside financial and human capital.
Our analysis has not paid much attention to the institutional context. How do institutional conditions alter the effects we found? There are two institutional differences which we did account for in our analysis. Assuming that variation in the need for managers rich in social resources indeed exists between employers, our preliminary analysis on different labor market sectors suggests that recruitment behavior of employers does not make a large difference in the impact of social capital in the income attainment process of managers. It is unlikely that the results of our analysis could be produced just by the fact that companies of different sizes pay different incomes for the same functions or dictate differing social networks. By controlling for size of the establishment, we practically also controlled for the size of a company. Furthermore, we did control for the market sector the company is acting on, whether this is the manufacturing or the service sector.

Another task is to replicate these findings in other institutional contexts, in other countries (see, e.g., Lin and Yan-jie Bian 1989, who replicated earlier models of the job-finding process for communist China), and in other occupational groups. What is needed, above all, is a dynamic analysis of social networks, one that follows social networks through time, to answer pertinent questions in a more conclusive way.

Notes to appendix:
1 Years of schooling
2 Years of experience
3 Number of former functions in the same organization
4 Number of high level work contacts in other organizations
5 Number of memberships
6 Logarithm of the number of direct and indirect subordinates
7 Logarithm of the average gross yearly income
<table>
<thead>
<tr>
<th>Variable</th>
<th>Level</th>
<th>Social Capital</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Level 2 (n = 420)</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Level 3 (n = 304)</th>
<th>Mean</th>
<th>SD</th>
<th>Skewness</th>
<th>Level 4 (n = 296)</th>
<th>Mean</th>
<th>SD</th>
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<td>0.075</td>
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<td>0.077</td>
<td>0.136</td>
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References

Beck, E.M. and Gienna S. Colclough

Blaug, Mark

Bourdieu, Pierre

Boxman, Ed A.W.

Bridges, William P. and Wayne J. Villemez

Burt, Ron S. and Don Ronchi

Campbell, Karen E., Peter V. Marsden and Jeanne S. Hurlbert
1986 “Social Resources and Socioeconomic Status”. Social Networks 8: 97–117.

Coleman, James S.

De Graaf, Nan D. and Hendrik D. Flap

Flap, Hendrik D.

Granovetter, Mark S.

Granovetter, Mark S.

Granovetter, Mark S.

Joreskog, Karl G. and Dag Sörbom

Lin, Nan
Lin, Nan, John C. Vaughn and Walter M. Ensel

Lin, Nan and Mary Dumin

Lin, Nan and Yan-jie Bian

Marsden, Peter V. and Jeanne S. Hurlbert

Marsden, Peter V. and Karen E. Campbell

Niemoller, Broer, Wijbrand H Van Schuur and Frans N. Stokman

Preisendörfer, Peter and Thomas Voss

Smelser, Neil J. and Robin Content

Williamson, Oliver E.