

Dorothea Jansen

Supporting Newly Founded Firms – Personal and Professional Networks



• • • • •
FÖV

3

Discussion Papers

Dorothea Jansen

**Supporting Newly Founded Firms
– Personal and Professional Networks**

**FÖV 3
Discussion Papers**

Forschungsinstitut für öffentliche Verwaltung
bei der Deutschen Hochschule für Verwaltungswissenschaften Speyer

2003

Nicht im Buchhandel erhältlich

Schutzgebühr: € 5,-

Bezug: Forschungsinstitut für öffentliche Verwaltung
bei der Deutschen Hochschule für
Verwaltungswissenschaften Speyer
Postfach 14 09
67324 Speyer

<http://www.foev-speyer.de>

Universitätsprofessorin Dr. rer. soc. Dorothea Jansen

Ordentliches Mitglied des
Forschungsinstituts für öffentliche Verwaltung

Inhaberin des Lehrstuhls für Soziologie der Organisation
an der Deutschen Hochschule für Verwaltungswissenschaften Speyer

Content

| | |
|---|----|
| Abstract | 1 |
| 1. Introduction | 3 |
| 2. Support networks, support types and success in entrepreneurship | 3 |
| a. Social capital and network structure | 4 |
| b. Types of supporters, missing resources and support flow | 7 |
| 3. Theory design, database and concepts | 9 |
| a. Dimensions of success | 11 |
| b. Network structure and support from networks and public infrastructure | 12 |
| 4. Network structure and support as conditions for success | 13 |
| a. The founders' network | 13 |
| b. Network structure and success | 17 |
| c. Types of supporters and success | 18 |
| d. Financial support and success | 23 |
| 5. Conclusions | 26 |
| 6. References | 28 |

Abstract¹

Entrepreneurs have among other roles been characterized as those who bring innovative products and services to a market, as those who coordinate the assembling of resources and people or as those who make a profit from arbitrage. All these roles and their fulfillment depend on networks, networks of information and innovation, networks of potential suppliers and contractors, networks of collaboration and coordination.

Thus, embeddedness of entrepreneurs, their networks and their social capital have become prominent topics in entrepreneurship research. There is by now a large amount of literature on the beneficial effect of embedding economic transactions and firms into personal and business networks. But, empirical evidences also show that networks can yield social capital as well as social liabilities.

There are several ways to explore the effect of networks on entrepreneurial activities. A first line of research deals with the question of whether some characteristics of personal networks pose opportunity structures to nascent entrepreneurs and trigger them to found a new firm. A second line of research asks for the relation between general characteristics of the entrepreneur's network and his success in business. A third line instead or in addition to looking at general network characteristics analyzes supporters and the resources they provide depending on the demand and the deficits of the new firm and its founder. It is argued here that an approach that combines general network characteristics as "infrastructure" and an analysis of specific supporters and resource flows might be able to reconcile some of the inconclusive evidences on the positive or negative effects of networks.

1 This is the revision of a paper that I presented at the colloquium of the Department of Sociology at the Rijksuniversiteit Groningen during a research stay. This stay was made possible by a grant from the Netherlands Organization for Scientific Research. The empirical evidence comes from a project I conducted together with *Mike Weber* at the Forschungsinstitut für öffentliche Verwaltung Speyer. I gratefully acknowledge project funding by the German Research Association. The research report is available from the author on request. A book is forthcoming soon at Westdeutscher Verlag (*Jansen/Weber, 2003: Zur Organisation des Gründungserfolgs*, Westdeutscher Verlag: Wiesbaden).

This paper will follow this approach in the analysis of data from a representative retrospective survey of 347 respondents who founded a firm in 1994 in the area of the 'Ruhrgebiet'. The sample includes all kinds of newly founded firms except crafts and the traditional professions (e.g. lawyers, doctors). The retrospective design allows to analyze the success of the firm in several dimensions: the survival of the firm, the time point of reaching profitability, the growth in sales and employment, the innovativeness of the product strategies and further personal success factors. The study comprises a broad catalogue of questions about the social embeddedness of the founder, his personal and professional network, and his use of public support. This makes it possible to identify partial effects of the different kinds of networks and of supporters, their interaction effects with particular deficits, and the multivariate control of these interrelations.

1. Introduction

This paper starts from two questions: why could networks be important in the process of founding a new firm and what could the benefit of social network analysis in entrepreneurship research be. It will answer these questions by an empirical analysis of data on network structures and support used by young entrepreneurs in the Ruhr Area. In particular the paper deals with the problem of whether deficits of the young entrepreneur and his new firm can successfully be compensated by help from personal and professional networks and from public support agencies (chapter 2).

The general theoretical approach of the project, the database and the operationalization of several concepts used in the further analysis are introduced in chapter 3. Chapter 4 deals with the empirical evidences concerning the questions: (1) Who does command which network structure and uses which channels of support? (2) What might the benefit of network structure and several types of support in the entrepreneurship process be? Finally it takes a closer look at financial support. Chapter 5 summarizes the results of the analysis and answers the questions put forward in chapter 2.

2. Support networks, support types and success in entrepreneurship

Entrepreneurs have been characterized as those who bring innovative products and services to a market, as those who coordinate the assembling of resources and people or as those who make a profit from arbitrage. All these roles and their fulfillment depend on networks, networks of information and innovation, networks of potential suppliers and contractors, networks of collaboration and coordination (Ripsas 1998).

Thus, embeddedness of entrepreneurs, their networks and the social capital they derive from them have become prominent topics in entrepreneurship research.² Economists and sociologists stress the

2 *Aldrich/Zimmer* 1986, *Johannisson* 1986, 1987, 1995, *Dubini/Aldrich* 1991, *Staber/Aldrich* 1995, *Katz/Williams* 1997, *Brüderl/Preisendörfer* 1998, *Flap et al.* 2000, *Annen* 2001, *Anderson/Jack* 2002.

importance of networks in embedding business relations (Granovetter 1985, Powell 1990, Powell and Smith-Doerr 1994, Williamson 1993). Transaction cost economics relies on the model of homo oeconomicus (albeit with imperfect knowledge and information asymmetries) who establishes and uses ties and networks in an efficient way. Empirical researchers from economics and sociology often debate this model of man. Whether it is efficiency or trust that drives the network mechanisms and its benefits, may be an open question. Clearly, there is by now a large amount of literature on the positive effect of embedding economic transactions and firms into personal and business networks.³ However, empirical evidences also show that networks can yield social capital as well as social liabilities.

There are several ways to explore the effect of networks on entrepreneurial activities. A first line of research deals with the question of whether some characteristics of personal networks pose opportunity structures to nascent entrepreneurs and trigger them to found a new firm (Johannisson 1996, Aldrich and Zimmer 1986, Aldrich et al. 1987, Aldrich et al. 1989, Staber and Aldrich 1995). A second line asks for the relation between general characteristics of the entrepreneur's network and his success (Bühler 1999: 178 f., Jansen 2001). A third line instead or in addition to looking at general network characteristics analyzes supporters and the resources they provide depending on the demand and the deficits of the new firm and its founder (Brüderl and Preisendörfer 1998, Jansen and Weber 2003). It is argued here that an approach that combines general network characteristics as "infrastructure" and an analysis of specific supporters and resource flows might be able to reconcile some of the inconclusive evidences on the positive or negative effects of networks.

a. Social capital and network structure

Following Bourdieu (1973, 1983) and Coleman (1988, 1990), I understand social capital as an aspect of social structure that yields better opportunities for individual or collective action. Social capital thus is an asset like human capital or financial capital, albeit less tangible and less appropriable to the individual. Ego's network posi-

3 *Burt 1992, Uzzi 1996, 1997, Andrews/Knoke 1999, Gabbay/Leenders 1999, Lounsbury/Ventresca 2002, Jansen 2003.*

tion and his social capital from this position not only depend on him, but also on the alteri in his network. Potential yields of social capital can be more or less private goods like information and arbitrage profits (high rivalry in consumption and potential exclusion from it) or collective goods like trust into community norms or capacity of a group for self-organization (low in both). Social influence and legitimacy is somehow in between of public and collective goods (interdependence with high status of incoming ties).⁴

What is the relation of social capital and its benefits or liabilities to network structure? To say it in a nutshell, large weak tie networks with many structural holes support information variety and efficiency, structural autonomy from other actors or groups and gains from brokerage. This is Burt's argument on structural holes combined with Granovetter's earlier argument on the strength of weak ties. Burt (1992: 34 ff.) proposes that besides network characteristics like the size or the amount of weak ties in a network, the existence of structural holes in sparse and non-redundant networks pulls people into entrepreneurial opportunities and positively influences their success. Structural holes – so Burt – yield excellent entrepreneurial opportunities to those positions that can bridge the holes. If two partners of ego don't know each other, ego should be able to extract arbitrage profits from them and play one off against the other.

The idea of structural holes ties in with a line of reasoning that Granovetter (1973, 1974) started with his evidence on the “strength of weak ties” in finding a new job. Weak ties, i.e. ties to more distant acquaintances turned out to be more helpful than ties to family members or close friends. They yielded less redundant information and access to better job offers. While the argument of weak ties is one on information opportunities, Burt's argument on structural holes is based on the idea of “tertius gaudens”. When profiting from structural holes entrepreneurs profit from a social structure of imperfect competition. This is an argument on profiting from transaction costs of others, not an argument on minimizing transaction costs by long-term cooperation and embedded relational contracting.

On the other hand small strong tie networks with strong cohesion and closure nurture group solidarity and trust in community norms.

4 For the recent discussion of the concept of social capital see *Portes 1998, Sandefur/Lauman 1998, Jansen 2000, Lin et al. 2001.*

Prominent examples in small business support are rotating credit associations that provide the money for the new firm. Empirical evidence mostly comes from ethnic or minority entrepreneurship studies (Coleman 1988, Aldrich and Waldinger 1990, Waldinger et al. 1990, 1996, Portes and Sensenbrenner 1993, Portes 1995, Flap et al. 2000). But, besides positive evidence, there is also evidence on the dark sides of closed networks. The enforcement of solidarity in close communities can mean that the more successful members of the community have to quit in order to stay successful. Family ties can be so strong that entrepreneurs will never make it because they have to pay salaries to lots of relatives. Also, social closure in industrial districts or industry sectors can blind firms and managers to new technologies and opportunities (Grabher 1993, 1990, Kern 1998, Burt 2000; Gargiulo and Benassi 2000).

Finally, there is a third structural source of successful action. Networks with some sort of hierarchy/stratification in social status yield influence to those in the top positions and self-organization capacity to a group. Since this paper will deal with an analysis of ego-network-data I will not go deeper into network and group positions and their relation to social capital, which presuppose data on larger network structure (for an introduction see Jansen 1999, 2000).

So, concerning general characteristics of networks, there are three important and partly conflicting hypotheses on why networks could help the entrepreneurial process:

- (1) The argument of structural holes (Burt 1992),
- (2) The earlier argument of weak ties (Granovetter 1973) and finally
- (3) The argument of bounded solidarity as a collective asset of closed networks (Coleman 1988).

So, the two hypotheses on the beneficial effect of either structural holes / weak ties or social closure and strong ties concur. I also take into account two refinements. Information for innovativeness might come from weak ties and structural holes while closed strong tie networks might support more traditional business ideas and even help to survive in spite of low sales and profitability. And of course the more ties a founder can rely on, the better for the new firm.

b. Types of supporters, missing resources and support flow

Networks are infrastructures of relations. Their mere existence does not imply that they are actually used. Social capital thus **can** be converted into other forms of capital or second order resources, but it need not.⁵ Thus I distinguish between networks and their general characteristics on the one hand and real supporter and their resources. The most important sources of support are:

- Support from the family, relatives and friends,
- More distant and/ or professional supporters like former colleagues, business partners, lawyers and accountants,
- Finally the role of public agencies has to be taken into account.

Personal, professional and public support can provide crucial information and ideas. They can hopefully compensate for skills, experience and money that the young entrepreneur might be lacking. So we also need to control whether specific deficits of the founder for instance a lack of market experience or of start-up capital can be compensated by specific ties or by help from public agencies.

Rarely, the relation between support from personal and professional networks and support from public agencies is analyzed in network studies, today. Business development policy in Germany by now offers a large amount of programs to assist new firms, reaching from advice and training seminars to special conditions for getting start-up capital. There is ample evidence that public advice and training programs for entrepreneurs in general have a positive effect on the success of new firms (Bach 2001, Bundschuh 1998, Schütte 1996, Gries et al. 1997). A crucial question is though, whether these programs and agencies actually reach *and* help those founders and firms that need advice and training the most. For one thing, there might be some self-selection effect. Another problem is that advice might presuppose some absorptive capacity on the side of the client. Advice and training are personal services, i.e. their benefits come out of a co-production process. Tödt (2001: 104 ff.) differentiates between the capacity of the client to search and accept advice, to

5 This differentiation is an insight from community studies of personal support networks in families and neighbourhoods (*Wellman et al. 1988, Walker et al. 1994*).

interact successfully with the adviser and finally to implement what has been learnt. Thus, effective advice – say on taxes, loans or regulation – might be dependent on characteristics of the founder.

A final question is whether supporters from personal or professional networks and from public agencies are functionally equivalent in improving the prospects of the new firm. Different types of support may well have different effects on different performance indicators. The simplest indicator of success seems to be survival of the firm. But in fact, there are problems to infer success from survival and failure from death. Firms may get shut down, not because of failure but because of merger or even because they did their job (for instance in the management of real estates). Surviving firms on the other hand never may have become profitable, they sometimes even do not earn their founder an adequate living. Aspiration levels of entrepreneurs are different and the phenomenon of the persistence of under-performing firms has triggered some interest. Family firms, founders from families with a business owning tradition or founders with intrinsic motivation for self-employment were found to be typical cases of a reduced threshold for exit (Meyer and Zucker 1989, Gimeno et al. 1997). Professional or public advice could be expected to lead to the adoption of standard economic performance indicators (e.g. increase in turnover or income, profitability, increase in employment). Support from family, relatives and friends might lead to lower aspiration levels and a less calculating attitude concerning unpaid work or return on investments.

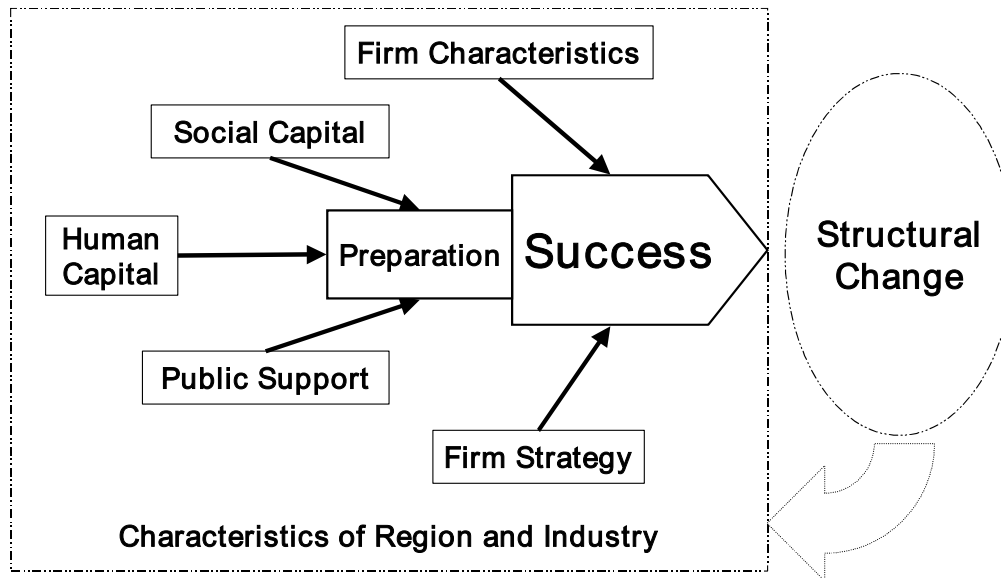
Self-selection and adverse selection are endemic problems of programs helping young entrepreneurs with start-up capital and public loans. Another question is how to evaluate the effect of such programs. Do public start-up assistance programs actually stimulate innovative products and services, a main goal of SMES-programs today? But even a control group comparison does not rule out the possibility that it is not the money in the first place that makes funded firms more successful, but the process of planning and information gathering that proceeds an unsuccessful application. Concerning the question of functional equivalence of loans from different supporters, there is even evidence that the most successful firms do not resort to public programs but to credit banks (Kulicke 1993). Instead, adverse selection leads less successful firms into public programs. The Munich study tried to get at the proper effect of public funding by comparing funded firms and a similar control group in their sample (Bruederl et al. 1996). They found that the probability of survival increased by 20

% with public funding. A DtA and ZEW study matched funded firms and non-funded ones. They came to similar results (Almus/Prantl 2001a, 2001b).

3. Theory design, database and concepts

The larger theory model of the project can be seen from figure 1. The analysis includes five main constructs and their influence on the intensity and quality of the pre-founding preparation and the success of the new firm:

- Organizational factors of the firm like size or industry class,
- Human capital like education or managerial training,
- Social capital,
- Public support and
- Business strategy, like choice of markets, suppliers and contractors.
- Finally the design tries to control for regional effects and to figure out the effect of new firms on regional development.

Figure 1: Theory model

This paper will focus on three bundles of effects: on social capital and support, on public support and on its interrelation to human capital or the lack thereof.

The database is a representative retrospective survey of 347 respondents who founded a firm in 1994 in the area of the 'Ruhrgebiet'. The parent population consists of those around eleven thousand founders who registered for a new business in 1994 in two chambers of commerce in the Ruhrgebiet. This includes all kinds of newly founded firms except crafts and the traditional professions (e.g. lawyers, doctors).

The sample drawn from this population was stratified along four criteria: region, size (only trading license or in addition entry into the trade register) and industry (manufacturing, special services, all other), and finally survival of the firm in 1999. Larger firms, non-surviving firms and firms from manufacturing and special services were over-represented. Nevertheless, it turned out to be not easy to reach non-surviving firms. We also sent out a short version of the questionnaire and finally followed up non-surviving firms at the trade registers and conducted telephone interviews. For some cases therefore we have a reduced set of variables.

a. Dimensions of success

What is success in founding a new firm? Goals and aspiration levels of founders are different. A factor analysis of several indicators of success results in three main factors:⁶

- Economic success: survival (dichotomous), percentage growth in employment, growth in sales (5 point scale), and profitability (number of months from the start),
- Personal satisfaction: growth in income (5 point scale), willingness to start same business again (3 point scale: none, some other business, this business),
- Innovativeness: product and service strategy (3 point scale), % of sales in innovative products.

6 Missing values were replaced by the means. Growth in income, inclination to found the same business again, and percentage of sales in innovative products are missing prone. This is due to the fact that these variables were not included in the short version of the questionnaire. The missing handling by means allows tease out the most of information without leading to an artificial factor: long vs. short questionnaire. Replications with only the factor variables each come to more or less the same results.

Table 1: Dimensions of success: Rotated factor loading matrix

| | <i>Economic success</i> | <i>Personal satisfaction</i> | <i>Innovativeness</i> |
|---------------------------------------|-------------------------|------------------------------|-----------------------|
| <i>Survival</i> | 0,606 | 0,220 | 0,010 |
| <i>% employment change</i> | 0,693 | -0,190 | 0,007 |
| <i>Growth in sales</i> | 0,698 | 0,218 | 0,264 |
| <i>Profitability</i> | 0,528 | 0,446 | -0,171 |
| <i>Growth in income</i> | 0,319 | 0,721 | 0,060 |
| <i>Do it again?</i> | -0,073 | 0,820 | 0,112 |
| <i>Innovative product strategy</i> | 0,132 | 0,052 | 0,785 |
| <i>% sales in innovative products</i> | -0,038 | 0,049 | 0,807 |
| <i>Explained</i> | 28,6% | 16,3% | 13,2% |

For the further analysis four variables are selected: Survival, sales growth, profitability from the economic success factor and product strategy from the innovativeness factor. All variables from here on are used in a dichotomized version.

b. Network structure and support from networks and public infrastructure

All network indicators were collected with special reference to the founding process. Structural indicators were sought for a small ego-network of the founder, his most important ties in the founding process. In addition he was asked for the number of further weak ties of relevance. This questions refers to the larger network beyond family and friends (0 to 10) and yields an indicator for breadth of the larger network and its second order resources. To describe either network closure or structural holes, the density of relations between the alteri weighted by their strength is used. The lower this density, the more the alteri are strangers to one another (range: 1 = all alteri don't know

each other, 4= all know each other). This means on the one hand there is little opportunity for them to control ego for instance in paying back debts. On the other hand, ego might have a non-redundant network reaching out to very different resources not yet coordinated. This might help him with new and innovative ideas or yield arbitrage profits. Strength of ties also is a characteristic of the ego network (range: 1 = distant acquaintance, 4 = know very well). It is the average intensity of the relation between ego and his alteri. The stronger this relation, the more support can probably be expected by ego.

In order to get at the actual use of social capital, we constructed three support indices. The indices for support from the personal and professional network are weighted measures on how many supporters are involved and how intense the founder judged their support. The index on public support is a count variable on how many different institutions (n=10) were used. All three indices finally were transformed to a scale from zero to hundred, meaning the theoretical maximum of support. While personal and public support empirically do reach the maximum range, professional support does not (max value = 68 out of 100). Personal support is used on average with largest intensity (mean=30,8), public support with lowest intensity (10,6) and professional support in between (21,6).

4. Network structure and support as conditions for success

a. The founders' network

Table 2 shows some basic correlation for the structural network indicators, table 3 for the support types. The networks and supporters are described here particularly with an eye to the question of compensating for a lack of resources. Indicators for a potential lack of resources are gender, formal education, entrepreneurial and industry experience. All variables are used here in a dichotomized version.

Table 2: Network structure and indicators for the lack of resources (Pearson correlation)

| | <i>Network Closure</i> | <i>Strength of Ties</i> | <i>Number of Weak Ties</i> |
|--|------------------------|-------------------------|----------------------------|
| <i>Gender: male</i> | 0,039 | - 0,071 | - 0,008 |
| <i>Formal education: higher education</i> | - 0,051 | - 0,092 (*) | 0,029 |
| <i>Industry experience: yes</i> | 0,092 (*) | - 0,006 | 0,052 |
| <i>Entrepreneurial experience: yes</i> | - 0,055 | - 0,078 | - 0,091 |
| <i>Start-up Capital: above 10.000 DM (□ 5.114)</i> | - 0,032 | - 0,182 *** | 0,049 |
| <i>Industry: Services</i> | - 0,084 | - 0,018 | 0,109 * |
| <i>Founding type: Genuine new firm</i> | - 0,076 | 0,081 (*) | - 0,023 |

Significance or r: (*) 80% * 90 % ** 95 % *** 99 %

The baseline model variables, which are used for all further analyses, are:

- Industry sector, here a dummy of services (self judgement + replacement by official data for missing values) versus all other industries,
- The type of founding, here a dummy contrasting genuine new firms with derivative founding of all other sorts,
- And a size variable, here start-up capital above 10.000 DM.

These variables are used to control for liabilities of smallness and newness and for industry-specific effects.

Table 3: Support types and indicators for the lack of resources (Pearson correlation)

| | <i>Personal Support</i> | <i>Professional Support</i> | <i>Public Support</i> |
|--|-------------------------|-----------------------------|-----------------------|
| <i>Gender: male</i> | 0,001 | 0,018 | 0,042 |
| <i>Formal education: higher education</i> | - 0,066 | 0,158*** | 0,046 |
| <i>Industry experience: yes</i> | - 0,075 | 0,126 * | - 0,082 |
| <i>Entrepreneurial experience: yes</i> | - 0,158 ** | 0,093 (*) | - 0,064 |
| <i>Start-up Capital: above 10.000 DM (□ 5.114)</i> | - 0,189 *** | 0,152 ** | - 0,100 * |
| <i>Industry: Services</i> | 0,046 | 0,159 *** | 0,073 |
| <i>Founding type: genuine new firm</i> | 0,141 ** | 0,094 (*) | 0,111 * |

Significance or r: (*) 80% * 90 % ** 95 % *** 99 %

What we see is a very small tendency for founders with a lack of human capital and a need of help for their genuine new firm to mention ego networks with strong ties to their alteri. In the case of lack of financial capital they also command rather strong ties, this is the only strongly significant correlation. Those who start their business in services involve more weak ties in the founding process than founders in other industries.

Table 3 goes deeper into the types of support. It shows that gender still does not make much of a difference. Men do to a small extent resort more often to professional and public support. This is also true for founders commanding a higher education. Those founders who do not have experience in entrepreneurial activities or do not possess market and industry experiences tend to use their personal support network.⁷ Those more familiar with their market and the entrepreneurial tasks instead use professional sources of support.

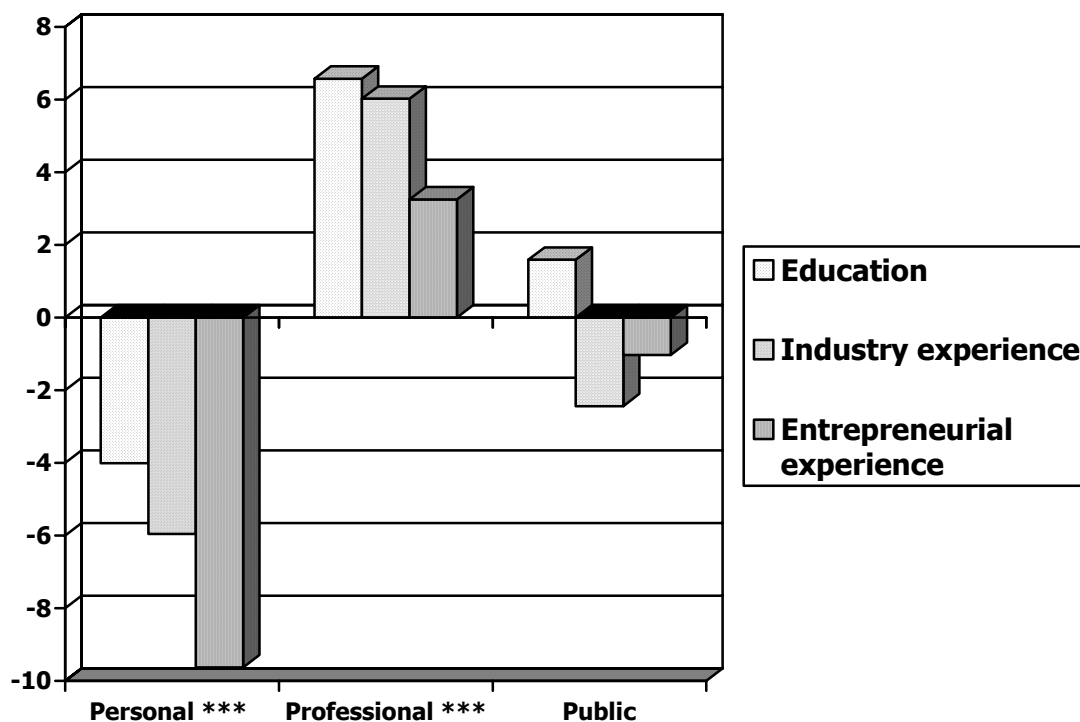
7 To a lesser and non-significant extent they also resort to public support in order to compensate for their lack of specific human capital. Their deficit in using professional help might be partly compensated by public assistance.

Coming to the characteristics of the firm, we find much the same evidences. Smaller firms with a start-up capital below 10.000 DM search for personal support more intensely. To a lesser extent they resort to public support, while larger firms and firms from the service sector prefer professional support.⁸

Figure 2 shows the differences in estimated means of support for subgroups with high versus low general and specific human capital. This is the result of an ANOVA model with a multiple classification analysis. All three models include the covariates start-up capital, industry and type of founding. The model for personal support also includes an interaction effect between industry experience and education. It explains 10,3% of variance (sig. 0,003). Significant effects are entrepreneurial experience and the covariate genuine new founding. The model for professional support includes only the main effects and explains 14,8 % variance (sig. 0,000). Significant covariates are start-up capital and service industries. Education and industry experience have significant effects on the amount of professional support. The model for public support also includes only the main effects. It is not significant (eta squared = 0,011, sig. 0,917).

8 Forming a genuine new firm triggers a lot of search for support in all types.

Figure 2: Differences in estimated means of support



To sum up, the compensation hypotheses that deficits of the firm, the founder or larger tasks make for a search for support with respect to personal networks and to a lesser extent with respect to public support is corroborated by the data. On the contrary the use of professional networks is typical for those founders and firms with better starting conditions.

The next steps will be to ask for the importance of network characteristics and support for the economic prospect of a new firm. Finally I will deal with the question of whether compensation strategies actually do increase the chances of a new firm.

b. Network structure and success

Effects of structural network characteristics seldom reach significant levels. The most important effect is the strength of ties to the alteri in the ego network. Alteri with strong ties to the founder obviously provide more and more valuable support. Strong ties help more with survival than with economic performance (not yet significant) or with

an innovative business strategy. At least within small ego networks, for which we have data, structural holes between alteri do not have a positive effect on any success variable. The non-significant effect on innovativeness is even in the “wrong” direction. Weak ties contrary to the hypothesis have no effect on any performance indicator. Signs for growth and innovativeness are also in the wrong direction.

Table 4: Success and network structure (logistic regression models, B)

| | <i>Survival</i> | <i>Growth in Sales</i> | <i>Network Closure</i> |
|--|-----------------|------------------------|------------------------|
| <i>Network Closure</i> | 0,001 | - 0,061 | 0,158 |
| <i>Strength of Ties</i> | 0,900 *** | 0,453 (*) | 0,022 |
| <i>Number of Weak Ties</i> | 0,114 | - 0,027 | - 0,018 |
| <i>Start-up capital</i> | 0,414 | 0,866** | 0,117 |
| <i>Industry sector: service</i> | 0,549 (*) | - 0,108 | 0,595 (*) |
| <i>Type of founding: genuine new firm</i> | 0,144 | 0,594 (*) | 0,165 |
| <i>N</i> | 186 | 180 | 185 |
| <i>Pseudo R2 Cox/ Snell and Nagelkerke</i> | 0,067 / 0,105 | 0,050/ 0,070 | 0,027 / 0,036 |
| <i>Total Significance</i> | 0,046 | 0,157 | 0,530 |

Significance of B: (*) 80%, * 90%, ** 95%, *** 99%

Controlling for the base line model (start-up capital, firm from the service sector and genuine new firm) shows that higher start-up capital makes for better chances in any success indicator, firms from the service sector have slightly better prospects, and genuine new firms enjoy better growth chances.

c. Types of supporters and success

The personal network is the most important source of second order resources for enhancing the life duration of the new firm. Professional

support even has a slight negative impact on survival. This might be due to a quest for higher and earlier profitability of the firm.

Professional support and public support have stronger effects on economic success indicators like sales growth and innovativeness. Thus the hypotheses on the relevance of strong ties and personal support for survival and on professional and public support for economic success are confirmed by the data.

Table 5: Success and support from network and public infrastructure (logistic regression models, B)

| | <i>Survival</i> | <i>Sales Growth</i> | <i>Innovativeness</i> |
|--|-----------------|---------------------|-----------------------|
| <i>Personal Support</i> | 0,024 * | 0,009 (*) | - 0,001 |
| <i>Professional Support</i> | - 0,014 (*) | 0,016 (*) | 0,024 *** |
| <i>Public Support</i> | 0,016 | 0,003 | 0,013 (*) |
| <i>Start-up capital: above 10.000 DM</i> | 0,653 ** | 0,544 * | - 0,177 |
| <i>Industry sector: service</i> | 0,649 * | - 0,145 | 0,481 * |
| <i>Type of founding: genuine new firm</i> | - 0,210 | 0,713 ** | 0,046 |
| <i>N</i> | 273 | 260 | 269 |
| <i>Pseudo R2 Cox/ Snell and Nagelkerke</i> | 0,057 / 0,094 | 0,058/ 0,081 | 0,070 / 0,095 |
| <i>Total Significance</i> | 0,013 | 0,017 | 0,003 |

Significance of B: (*) 80% * 90% ** 95% *** 99%

Figure 3: Predicted probability of survival and growth

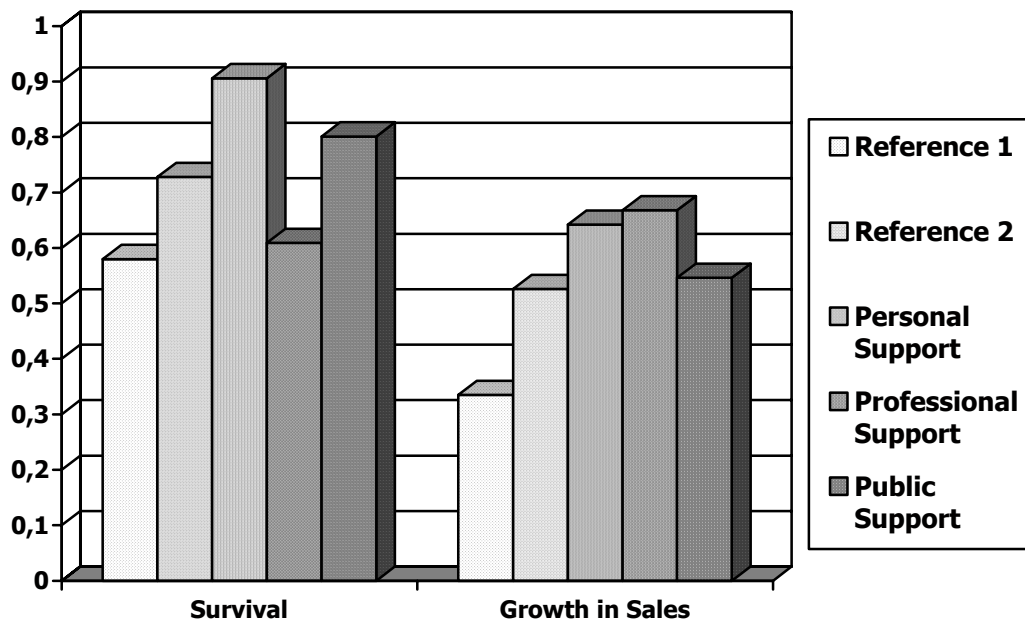
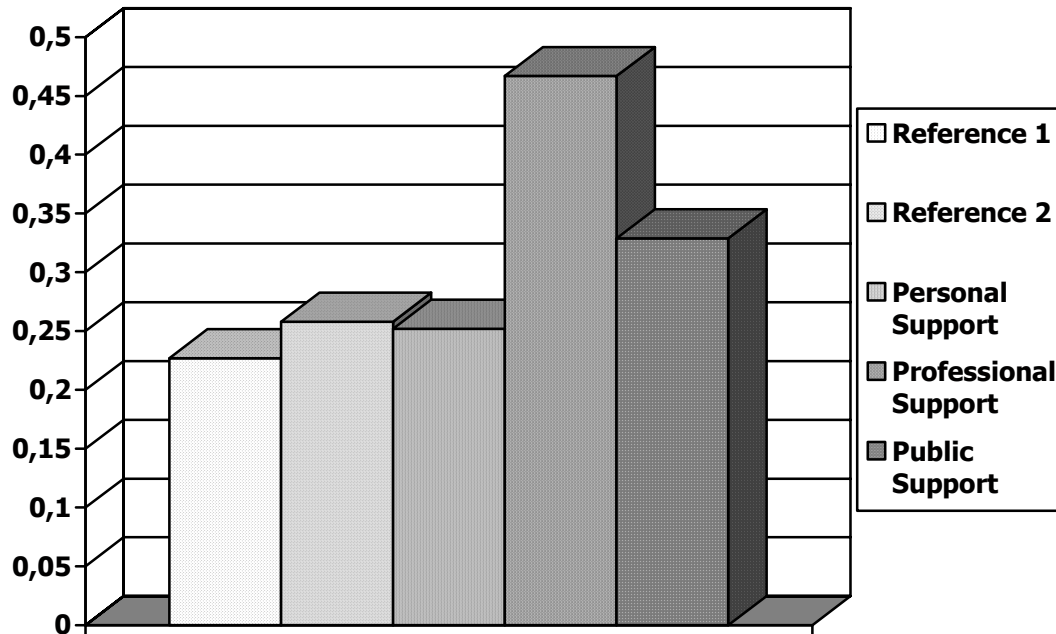


Figure 3 shows predicted proportions of successful firms in terms of survival and sales growth comparing several subgroups. Reference 1 is a zero contrast, firms with start-up capital below 10.000 DM, not from the service sector and not a genuine new firm without any type of support. Reference 2 is a contrast of mean values for the three covariates, without any type of support. The three bars for support add an effect of mean plus one standard deviation in the mentioned type of support. The two other types are set to zero.

To be cautious, not all effects shown here are significant in the model, particularly the effect for public support is not at all significant in the sales growth model (0,76), and also meager in the survival model (0,26). But what you see is, that personal support helps most in survival, while professional support reduces survival chance, but enhances the chances for economic growth.

Figure 4: Predicted probability of innovativeness



In figure 4 you see the predicted proportions of firms with an innovative product or service strategy. In this case, as you must remember from the table, the effect of personal support is insignificant, public support is hardly significant (sig. 0,16). Professional support and to a lower extent public support make for an innovative strategy of the newly founded firm. Starting conditions (size, industry sector and type of founding) in contrast to survival and growth have almost no effect on innovativeness.

Some positive effect of general and specific human capital on business success can of course be expected (Brüderl et al. 1996, Picot et al. 1989). Growth in sales thus correlates positively with formal education ($r= 0,122$) and entrepreneurial experience ($r=0,149$). Strangely in our sample there is no correlation ($-0,017$) between growth in sales and industry-specific experience. But this came out as one of the most important conditions of success in previous studies. This result and the need to clarify whether founders with missing formal education or specific human capital can compensate for this via their network resources leads to a more complex analysis of interaction effects.

Table 6: Compensation for missing skills: Interaction effects of growth of sales (ordinal) and support types for different subgroups (Pearson correlation)

| | <i>Personal support</i> | <i>Professional Support</i> | <i>Public Support</i> |
|-------------------------------------|-------------------------|-----------------------------|-----------------------|
| <i>All cases</i> | 0,078 | 0,134* | 0,121* |
| <i>Higher Education</i> | | | |
| <i>Yes (n=130)</i> | 0,195* | 0,085 | 0,081 |
| <i>No (n=204)</i> | 0,049 | 0,143* | 0,153* |
| <i>Industry-specific experience</i> | | | |
| <i>Yes (n=93)</i> | 0,251* | 0,286* | 0,231* |
| <i>No (n= 140)</i> | 0,037 | 0,099 | 0,012 |
| <i>Entrepreneurial Experience</i> | | | |
| <i>Yes (n= 46)</i> | -0,204 | 0,001 | 0,148 |
| <i>No (n=160)</i> | 0,232* | 0,238* | 0,113 |

Significance of r: * 90%** 95% *** 99%

In fact, contradictory to the compensation hypothesis, higher education of founders makes for a stronger effect of personal network support on sales growth compared to the group with less formal education. The reason for this is obviously a more resourceful network of academics. For the ego-networks we found a strong tendency towards homophily, thus ego and his alteri most often have the same educational background. Non-graduates don't get much help from their personal network. With respect to the other types of support the compensation-success hypothesis is confirmed by the data. Founders with less formal education do indeed profit from professional support and from support by public agencies to a greater degree than those with higher education.

Also founders who lack previous entrepreneurial experience can profit from their personal and professional networks: partial correlations of sales growth are larger for those without experience than for those with previous entrepreneurial experience. This is another

indicator of the profitability of a network compensation strategy of an entrepreneur.

Table 6 also shows that it is obviously very difficult for any type of supporter to transfer their knowledge successfully to founders without industry-specific experience. This is the knowledge most often asked for within the ego networks.⁹ While those with experience profit from any source, for those with no experience seeking support makes almost no difference in the economic performance of the firm. This stresses the argument of absorptive capacity of clients in personal services. Tacitness of knowledge may be one of the main obstacles for those without prior experience in the field to understand and implement the given knowledge in a successful way (Hansen 1999).

Another problem with the idea of compensating missing skills stays on the agenda. Entrepreneurs with deficits in formal education or skills tend to turn less often to professional and public advisers than academics or those already commanding critical knowledge. These are the sources of support, which have the most beneficial effect on the economic success of a firm. At least public agencies thus are requested to engage in a marketing strategy that will better reach their target groups.

d. Financial support and success

Out of those 197 cases with information on financing, 34% do not report any outside loans, 29% received outside capital from their personal network, 41% received capital from their professional network, mostly bank credits. Public money is rare, just 8 % report about public financial assistance. Around 15 % received capital from more than one source type. Included here are dichotomous variables on the existence of loans.¹⁰

9 Founders often try to get information from more than one alteri, too.

10 All loan variables are dichotomous but particularly public loans are heavily skewed. Success indicators are dichotomized, too.

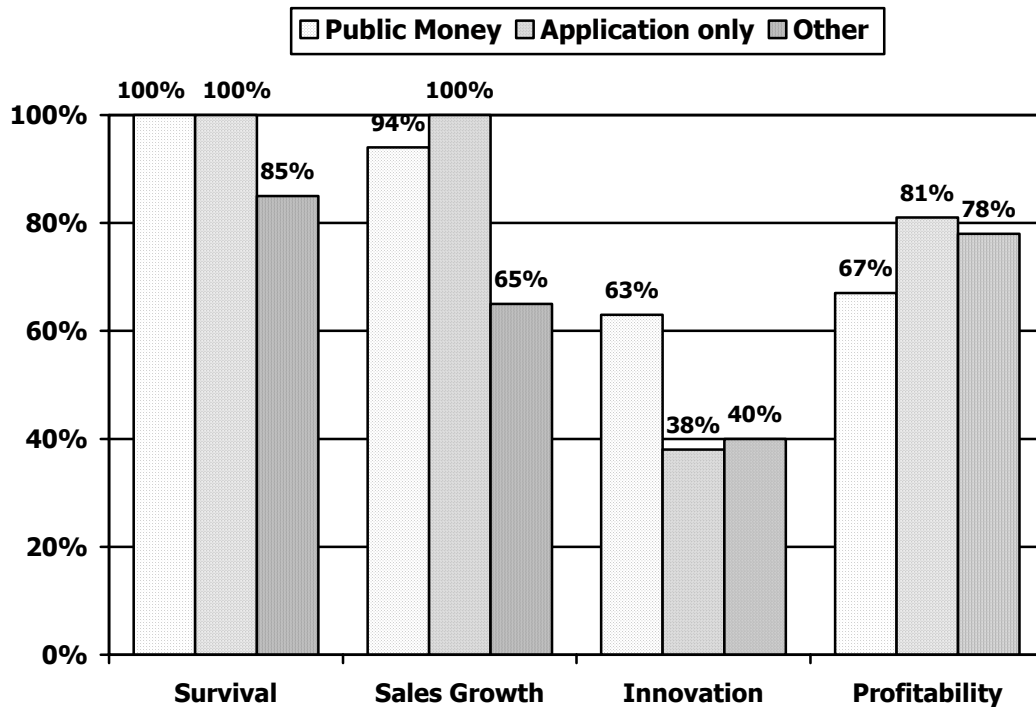
Table 7: Financial support and success (Logistic regression models)

| | <i>Survival</i> | <i>Sales Growth</i> | <i>Innovativeness</i> |
|--|-----------------|---------------------|-----------------------|
| <i>Personal Loan</i> | 0,421 | 0,083 | - 0713 ** |
| <i>Professional Loan</i> | 0,436 | 0,533 (*) | 0,165 |
| <i>Public Loan</i> | 5,751 | 1,804 * | 0,900 (*) |
| <i>Start-up capital</i> | 0,769 (*) | 0,428 | 0,390 |
| <i>Industry sector: service</i> | 0,488 | - 0,059 | 0,825 ** |
| <i>Type of founding: genuine new firm</i> | 0,277 | 0,922 ** | - 0,095 |
| <i>N</i> | 194 | 190 | 192 |
| <i>Pseudo R2 Cox/ Snell and Nagelkerke</i> | 0,045 / 0,088 | 0,071/ 0,101 | 0,072 / 0,097 |
| <i>Total Significance</i> | 0,182 | 0,031 | 0,026 |

Sig. of B: (*) 80% * 90% ** 95% *** 99%

Not being able to acquire outside money for the young firm has a clear negative impact on its chances for success. This table makes clear that money from the personal network has no or a negative influence on the success of the firm. As posited in the refined hypotheses on network closure, strong ties and personal sources of loans make for less innovative firms. Money from the professional network enhances chances for growth, but neither for survival nor for innovation. The strongest positive impact on all indicators of success comes from public money. Especially innovative ventures seem to profit most from public funding. Its effects are analyzed in detail in the figure 5. Because of small numbers (ranging from n=210 for profitability to n=224 for survival) the analysis is performed via simple percentage differences here.

Figure 5: The impact of public money and application for it (percentages)



The first question to be put to the data is whether the right people get the money. Another question is what it really is in public programs that helps small firms. The figure shows that an application in a public funding program indicates better planning and better chances from the very beginning. Firms who did not get money nevertheless made their way in traditional business. There is no difference in survival and sales growth between those who succeeded in applying and those who did not. Probably those who failed got money from the private banking sector.

With respect to innovativeness there is no difference between those firms who applied without success and firms who did not try at all. Thus we can conclude that for public capital assistance programs only more innovative firms are eligible and selected indeed. But looking at profitability this also means that firms who received public money bear the greater risks and have a longer way to profitability. In fact, public money deliberately chooses the higher risks.

5. Conclusions

Concerning the use of networks by the founders:

- The compensation hypothesis as far as search (not success) of help is concerned is confirmed for personal and public support, but not for professional support.
- Matching of founders and supporters is far from trivial. Self-selection prevents founders from asking the most effective “helping hands”.

Concerning the relevance of networks and support types for explaining success and the concurring hypotheses:

- Structural indicators of social capital seldom reach significance. Particularly, there is no positive effect of structural holes on entrepreneurial success in small ego networks. Also the positive effect of strong ties is confined to success in the sense of survival.
- The types of supporters have positive and significant effects on different success dimensions. Personal support helps to survive, professional support and public support make for growth and innovativeness.
- Some missing skills (e.g. higher education) can be compensated by support.
- Some skills (e.g. industry experience) are necessary to profit from support.

Concerning the relation of financial support and success:

- Public loans and in the second place other formal loans (banks, business partners) have a great impact on economic success.
- Financial support from the personal network does not help much, even hinders innovativeness.
- Unsuccessful applicants for public loans show more short term economic success than successful applicants.
- Public loans reach innovative firms with great prospects of success, but a longer and riskier way to profitability.

To sum up, supplementing structural analysis by an analysis of real support processes by networks and public infrastructure is a promising path for an analysis of the role of networks in entrepreneurship. It is

able to improve analytical insight into the founding process in particular and the value of networks in general. Some missing links in the arguments of Burt and Granovetter on the strength of weak ties and structural holes came to the fore. More important for the explanation of entrepreneurial success than tie weakness or lack of embeddedness are the tie's actual value in the sense of its ability to transport second order resources and its accessibility from the position of those who need support.

6. References

- Aldrich, Howard E./Zimmer, C.* (1986): Entrepreneurship through social networks, in: Aldrich, Howard E.: Population perspectives on organizations, Uppsala: Acta Universitatis Upsaliensis, pp. 13-28.
- Aldrich, Howard E./Rosen, B./Woodward, W.* (1987): The impacts of social networks on business foundings and profit: a longitudinal study, in: Churchill N.C./Hornaday, J. A./Kirchhoff, B. A./Krasner, O. J./Vesper, K.H. (eds.) Frontiers of entrepreneurship research, Wellesley, Mass: Babson College, pp. 154-168.
- Aldrich, Howard/Reese, Pat Ray/Dubini, Paola* (1989): Women on the verge of breakthrough: Networking among entrepreneurs in the United States and Italy, in: Entrepreneurship & Regional Development 1, 339-356.
- Aldrich, Howard E./Waldinger, Roger* (1990): Ethnicity and entrepreneurship, in: Annual Review of Sociology 16, 111-135.
- Almus, Matthias/Prantl, Susanne* (2001a): Bessere Unternehmensentwicklung durch Gründungsförderung? Studie des Zentrums für Europäische Wirtschaftsforschung (ZEW), Mannheim, Wissenschaftliche Reihe – Band 15. Bonn: DtA.
- Almus, Matthias/Prantl, Susanne* (2001b): Die Auswirkungen öffentlicher Gründungsförderung auf das Überleben und Wachstum junger Unternehmen, ZEW Discussion Papers, No. 01-03, Mannheim: ZEW.
- Andrews, Steven B./Knocke, David* (Hrsg.) (1999): Networks in and around organizations, Research in the Sociology of Organizations, Vol. 16. Stamford: JAI Press.
- Annen, Kurt* (2001): Inclusive and exclusive social capital in the small-firm sector in developing countries, in: Journal of Institutional and Theoretical Economics 157: 319-220.
- Bach, Heinz Willi* (2001) : Beratungsdienstleistungen für kleine und mittlere Unternehmen. Möglichkeiten und Grenzen der Arbeitsmarktberatung, in: Arbeit und Beruf (1): 4-5.
- Bourdieu, Pierre* (1973): Cultural reproduction and social reproduction, in: Brown, Richard (ed.): Knowledge, education, and cultural change, London: Tavistock, pp. 71-112.

- Bourdieu, Pierre* (1983): Ökonomisches Kapital, kulturelles Kapital, soziales Kapital, in: Kreckel, Reinhard: Soziale Ungleichheiten, Göttingen: Schwartz, pp. 183-198.
- Brüderl, Josef/Preisendörfer, Peter* (1998): Network support and the success of newly founded businesses, in: Small Business Economics 10 (3): 213-225.
- Brüderl, Josef/Preisendörfer, Peter/Ziegler, Rolf* (1992): Staatliche Gründungsfinanzierung und der Erfolg neugegründeter Betriebe, IHK spezial, München: IHK für München und Oberbayern.
- Brüderl, Josef/Preisendörfer, Peter/Ziegler, Rolf* (1996): Der Erfolg neugegründeter Betriebe. Eine empirische Studie zu den Chancen und Risiken von Unternehmensgründungen, Berlin: Duncker & Humblot.
- Bühler, Christoph* (1999): Die strukturelle Eingebundenheit neugegründeter Unternehmen, Dissertation an der sozialwissenschaftlichen Fakultät der Ludwig-Maximilian-Universität, München.
- Bundschuh, Thomas* (1998): Studie zu Überlebenschancen von Existenzgründern: Jeder zweite wirft hin. Industrie- und Handelskammer verstärkt ihr Beratungsangebot, Süddeutsche Zeitung vom 11.11.1998.
- Burt, Ronald S.* (1992): Structural holes: The social structure of competition, Cambridge: Harvard University Press.
- Burt, Ronald S.* (1997): The contingent value of social capital, in: Administrative Science Quarterly 42, 339-365.
- Coleman, James* (1988): Social capital in the creation of human capital, in: American Journal of Sociology Supplement 94: 95-120.
- Coleman, James, S.* (1990): Foundations of social theory, Cambridge, Mass.: Belknap Press.
- Dubini, Paola/Aldrich, Howard E.* (1991): Personal and extended networks are central to the entrepreneurial process, in: Journal of Business Venturing 6: 305-313.
- Flap, Henk D./Kumcu, Adem/Bulder, Bert* (2000): The social capital of ethnic entrepreneurs and their business structure, in: Rath, Jan: Immigrant business. The economic, political and social environment, London: MacMillan, pp. 142-161.

- Gargiulo, Martin/Benassi, Mario* (2000): Trapped in your own net? Network cohesion, structural holes, and the adaptation of social capital, in: *Organization Science* 11, 183-196.
- Gimeno, Javier/Folta, Timothy B./Cooper, Arnold C./Woo, Carlyn Y.* (1997): Survival of the fittest? Entrepreneurial human capital and the persistence of under-performing firms, *Administrative Science Quarterly* 42, 750-783.
- Glasmeier, Amy* (1991): Technological discontinuities and flexible production networks: The case of Switzerland and the world watch industry, in: *Research Policy* 20: 469-485.
- Grabher, Gernot* (1990): On the weakness of strong ties. The ambivalent role of inter-firm relations in the decline and reorganization of the Ruhr, WZB Discussion papers, 1990,4. Berlin: WZB.
- Grabher, Gernot* (ed.) (1993): The embedded firm: On the socio-economics of industrial networks, London: Routledge.
- Granovetter, Mark* (1973): The strength of weak ties, in: *American Journal of Sociology* 78 (6): 1360-1380.
- Granovetter, Mark* (1974): Getting a job. A study of contacts and careers, Cambridge, Mass.: Harvard University Press.
- Granovetter, Mark* (1985): Economic action and social structure: The problem of embeddedness, in: *American Journal of Sociology* 91: 481-510.
- Gries, Christin-Isabel/May-Strobl, Eva/Paulini, Monika* (1997): Die Bedeutung der Beratung für die Gründung von Unternehmen, IfM-Materialien, Bonn: IfM.
- Hansen, Morten T.* (1999): The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits, *Administrative Science Quarterly* 44: 82-111.
- Jansen, Dorothea* (1999): Einführung in die Netzwerkanalyse. Grundlagen, Methoden, Anwendungen, Opladen: Leske + Budrich.
- Jansen, Dorothea* (2000): Netzwerke und soziales Kapital. Methoden zur Analyse struktureller Einbettung, in: Weyer, Johannes (ed.): Soziale Netzwerke. Konzepte und Methoden der sozialwissenschaftlichen Netzwerkforschung, München: Oldenbourg, pp. 35-62.

- Jansen, Dorothea* (2001): Soziales Kapital von Unternehmensgründern. Theoretische Überlegungen und erste empirische Ergebnisse, <http://foev.dhv-speyer.de/survival/ppt/sozkap.pdf>.
- Jansen, Dorothea* (2003): Netzwerkansätze in der Organisationsforschung, in: Allmendinger, Jutta/Hinz, Thomas (eds.): Organisationssoziologie, Opladen: Westdeutscher Verlag, pp. 88-118.
- Jansen, Dorothea/Weber, Mike* (2003): Survival. Erfolgsbedingungen neu gegründeter Betriebe im Ruhrgebiet, Forschungsbericht des Forschungsinstituts für öffentliche Verwaltung Speyer, Forthcoming: Zur Organisation des Gründungserfolgs. Eine organisationstheoretische Untersuchung des Erfolgs neu gegründeter Betriebe im Ruhrgebiet, Opladen: Westdeutscher Verlag.
- Johannisson, Bengt* (1986): Business formation – A network approach, in: Scandinavian Journal of Management 4: 83-99.
- Johannisson, Bengt* (1987): Anarchist and organizers: Entrepreneurs in a network perspective, in: International Studies of Management & Organization 17, 49-63.
- Johannisson, Bengt* (1995): Paradigms and entrepreneurial networks – some methodological challenges, in: Entrepreneurship & Regional Development 7: 215-231.
- Katz, Jerome A./Williams, Pamela M.* (1997): Gender, self-employment and weak tie networking through formal organizations, in: Entrepreneurship & Regional Development 9: 183-197.
- Kern, Horst* (1998): Lack of trust, survival of trust. Some causes of the innovation crisis in German industry, in: Lane, Christel/Bachmann, Reinhard (eds.): Trust within and between organizations, Oxford: Oxford University Press.
- Kulicke, Marianne* (1993): Chancen und Risiken junger Technologieunternehmen. Ergebnisse des Modellversuchs "Förderung technologieorientierter Unternehmensgründungen" (BMFT), Heidelberg: Physica.
- Leenders, Roger Th. A. J./Gabbay, Shaul M.* (eds.) (1999): Corporate social capital and liability, Boston: Kluwer.
- Lin, Nan/Cook, Karen S./Burt, Ronald S.* (eds.) (2001): Social capital. Theory and research, New York: de Gruyter.

- Lounsbury, Michael/Ventresca, Marc J.* (Hrsg.) (2002): Social structure and organizations revisited, in: *Research in the Sociology of Organizations*. Amsterdam: JAI.
- Meyer, Marshall/Zucker, Lynne G.* (1989): *Permanently failing organizations*, Newbury Park: Sage.
- Monte, Alfredo del/Scalera, Domenico* (2001): The life duration of small firms born within a start-Up programme: Evidence from Italy, in: *Regional Studies* 35: 11-21.
- Picot, Arnold/Laub, Ulf D./Schneider, Dietram* (1989): *Innovative Unternehmensgründungen: Eine ökonomisch-empirische Analyse*, Berlin: Springer.
- Portes, Alejandro* (1998): Social capital: Its origins and applications in modern sociology, in: *Annual Review of Sociology* 24: 1-24.
- Portes, Alejandro* (ed.) (1995): *The economic sociology of immigration. Essays on networks, ethnicity, and entrepreneurship*, New York: Russell Sage Foundation.
- Portes, Alejandro/Sensenbrenner, Julia* (1993): Embeddedness and immigration. Notes on the social determinants of economic action, in: *American Journal of Sociology* 98: 1320-1350.
- Portes, Alejandro/Landolt, P.* (1995): The downside of social capital, in: *American Prospect* 26: 18-22.
- Powell, Walter W./Smith-Doerr, Laurel* (1994): Networks in economic life, in: Smelser, Neil J./Swedberg, Richard (Hrsg.): *The Handbook of Economic Sociology*, New York: Princeton University Press, pp. 368-402.
- Ripsas, Sven* (1998): Towards an interdisciplinary theory of entrepreneurship, in: *Small Business Economics* 10: 103-115.
- Sandefur, Rebecca L./Laumann, Edward O.* (1998): A paradigm for social capital, in: *Rationality and Society* 10: 481-501.
- Staber, Udo/Aldrich, Howard E.* (1995): Cross-national similarities in the personal networks of small business owners: A comparison of two regions in North America, in: *Canadian Journal of Sociology* 20: 441-446.
- Struck, Jochen/Thomsen, Uwe/Kuhn, Claudia* (1998): *Gründungsfinanzierung und Überbrückungsgeld – Zwei Förderansätze, eine Zielgruppe?*, Wissenschaftliche Reihe – Band 8. Bonn: DtA.

- Tödt, Andreas* (2001): Wirkung und Gestaltung von Beratung und Weiterbildung im Prozeß der Existenzgründung. Eine qualitative Untersuchung am Beispiel von Existenzgründern im ostdeutschen Transformationsprozeß. Arbeit, Organisation und Personal im Transformationsprozess, München, Mering: Rainer Hampp Verlag.
- Tzeng, Rueyling/Uzzi, Brian* (Hrsg.) (2000): Embeddedness & corporate change in a global economy, New York: Lang.
- Uzzi, Brian* (1996): The sources and consequences of embeddedness for the economic performance of organizations: The network effect, in: *American Sociological Review* 61: 674-698.
- Uzzi, Brian* (1997): Social structure and competition in interfirm networks: The paradox of embeddedness, in: *Administrative Science Quarterly* 42: 35-67.
- Uzzi, Brian* (1999): Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking finance, in: *American Sociological Review* 64: 482-505.
- Waldinger, Roger/Bozorgmehr, Mehdi* (eds.) (1996): *Ethnic Los Angeles*, New York: Russell Sage Foundation.
- Waldinger, Roger/Aldrich, Howard E./Ward, Robin* (eds.) (1990): *Ethnic entrepreneurs. Immigrant business in industrial societies*, Sage Series on Race and Ethnic Relations 1, London: Sage.
- Walker, Michael E./Wasserman, Stanley/Wellman, Barry* (1994): Statistical models for support networks, in: Wasserman, Stanley/Galaskiewicz, Joseph (eds.): *Advances in social network analysis*, Thousand Oaks u.a.: Sage, pp. 53-78.
- Wellman, Barry/Carrington, Peter A./Hall, Alan* (1988): Networks as personal communities, in: Wellman, Barry/Berkowitz, Stephen D. (eds.): *Social structures: A network approach*, Cambridge: Cambridge University Press, pp. 130-184.
- Williamson, Oliver E.* (1993): Transaction cost economics and organization theory, *Industrial and Corporate Change* 2, 107-56.