Networks and Entrepreneurship-
an analysis of social relations, occupational background,
and use of contacts during the establishment process

Arent Greve\textsuperscript{1,2}

The Norwegian School of Economics and Business Administration,
Bergen, Norway

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2. Comments and requests for copy of the questionnaire used in this study should be
addressed to Arent Greve, NHH, Breiviken 2, 5035 Bergen-Sandviken, Norway
e-mail: arent.greve@nhh.no
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Abstract.
A network perspective of entrepreneurship focuses on social processes influencing 
founding rates and social structures facilitating entrepreneurship through mobilization of 
complementary assets. This study analyzes network structures and activities during 
different stages of entrepreneurship. Data of ego-centered networks and network 
activities show that people in early stages of entrepreneurship have smaller networks 
and use less time networking than people in later stages. Measures of network density 
did not differentiate entrepreneurial stages, but the size of the network did including 
potential size through access to indirect contacts in independent clusters. Comparing the 
different phases of entrepreneurship there are differences in the occupational 
background of network persons. This concludes with a discussion of change or stability 
of networks during the founding process for successful entrepreneurship.

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INTRODUCTION
This study focuses on the social context of entrepreneurs where positions and activities in social
networks influence the ability of entrepreneurs to acquire and use information or resources that
help them establish and manage a business enterprise (Aldrich & Zimmer, 1986).

We suggest that the founding of a business can be divided into three phases that can be
identified as 1) idea development, 2) organizing the founding of a firm, and 3) running a newly
established firm (see also Wilken, 1979). During these three phases networks may be used for
different purposes, and the different phases may need different resources. The aim of this study
is to analyze how the network of entrepreneurs influence the establishment process. We shall
analyze network structures and activities of entrepreneurs in different phases of the founding
process, identifying the background of their network persons to get an impression of what kind
of resources they may contribute.

Entrepreneurship has been studied using a variety of points of departures from explanations
based on personality theories (McClelland, 1961; Miron & McClelland, 1979), economic theory
(Kent, 1982), cultural explanations (Geertz, 1963; Gustaffson, 1985), and ethnic background
(Aldrich et al., 1983). Recent studies have tried to explain business foundings through a

Aldrich, Rosen, and Woodward (1986) tested differences among entrepreneurs in different
stages of entrepreneurship regarding multiplexity, network activity, tie strength, relationship
type, and network age. In social networks persons may act as brokers between persons who do
not know each other, one study compared the role and personal characteristics of brokers in
entrepreneurial networks in Italy and USA, where brokers were used to penetrate social boundaries (Aldrich, Reese, & Dubini, 1991). It is a common belief that networks among women and men are embedded in different social contexts, however, comparing male and female entrepreneurs in Italy and the USA, Aldrich, Reese, and Dubini (1989) found more similarities than differences regarding network activity and density. The differences were more obvious in terms of composition of networks, as women include a larger proportion of females in their network than men. In Sweden entrepreneurial activities were compared in two different communities, it was shown that high entrepreneurial activities are favorable for business formations (Johannison, 1988). This study is part of the Aldrich et al. studies, using the same questionnaire, which is translated into Norwegian, we also added a few questions.

Studying business foundings from a network perspective is derived from ecological organization theory (Aldrich, 1979; Hannan & Freeman, 1977; 1989). Recent research within population ecology has concentrated on rates of business foundings and failures (Hannan & Freeman, 1987; 1989; Aldrich & Wiedemayer, 1990; Barnett & Amburgey, 1990; Ranger-Moore, Banaszak-Holl, & Hannan, 1991; Hannan & Carroll, 1992). The rates approach differs from other approaches because it does not make inferences about personal characteristics of the entrepreneurs or the culture of which they are a part. Instead it concentrates on quantitative attributes of environments and populations of organizations to predict founding rates. Population ecology studies founding rates as dependent on niche density and legitimacy of firms where increasing density of a certain population of firms increases founding rates up to a point of high density where death rates increase with a simultaneous decrease in founding rates. Founding and death rates are also influenced by legitimacy of a business, which is connected to the familiarity of certain kinds of businesses and their owners in an environment (Hannan & Carroll, 1992). These studies lay a foundation for studying entrepreneurship using a network perspective, they show the macro conditions that are a result of individual actions in a social context, where network analysis is used to show how social structure and actions influence business foundings.

3. Density in population ecology terms is the number of firms occupying a niche.
Niches have similar properties as a network or a cluster within a larger network (Burt & Talmud, 1993). Defining networks gives a more accurate definition of relevant actors within a niche. Studying networks of entrepreneurs is a study of social relations that affect founding rates of firms by concentrating on how social relations and structures facilitate the diffusion of resources that are necessary to establish firms. Characteristics of network persons in terms of positions or professions and of networks indicate the availability of resources in the environment and the quality of available information for entrepreneurs.

Studying entrepreneurship through an analysis of social networks offers a fruitful perspective on entrepreneurship. Economic behavior is embedded in a social structure (Granovetter, 1985), and studying how entrepreneurs participate in networks accentuates the importance of the social structure. Entrepreneurs either enter an existing niche or they establish new organizational forms, the latter is a rare occurrence. Most entrepreneurs enter existing niches because they have ideas and knowledge that they believe will give them a comparative advantage to other firms. The problem is to establish a business firm that can produce and market its products or services efficiently. To do that requires two different types of skills. One is setting up and organizing the firm, another is running the firm. Both activities require efficient routines, which can be learned or imported into the organization through social relations.

Entrepreneurs need both technological and administrative knowledge (and routines) to establish and successfully run a newly established firm (Cyert & March, 1963; Nelson & Winter, 1982; March & Olsen, 1989; Winter, 1990). Routines are developed, selected, and inherited within a variation, selection, and retention paradigm (Weick, 1979). Routines are also subject to diffusion through networks. Routines may transcend several organizations and they may be more stable with a longer life expectancy than single organizations. However, there is rarely a market for routines and ideas, therefore, the diffusion of routines depends on social structures. When new organizational forms emerge, or when a new organization of a familiar type is
established, they have poorly developed technologies. They will often try using routines inherited or imitated from other organizations or they will improve or combine and develop existing routines through trial and error (Lumsden & Singh, 1990). It is a process of experiential learning (March & Olsen, 1989) where routines are spread through contagion or diffusion in social networks (Rogers & Shoemaker, 1971).

Establishing a business firm means that entrepreneurs have to mobilize a set of resources to be able to accomplish the establishment process and run the firm. To establish a firm entrepreneurs need capital, labor (competence) and distribution channels. Most entrepreneurs start with their business idea and some capital. They may have only a vague cognizance of how to organize the establishment process and manage the firm. Therefore, contacts with other persons who may provide information to the entrepreneurs, are essential to complete the establishment process. Entrepreneurs may not know how to establish a firm or how to run a business when they conceive their business ideas. The ideas have to be developed and tested socially against critical and resourceful persons who may give valuable advice and connect an entrepreneur to business connections offering crucial resources.

Entrepreneurs are assumed to go through three phases of entrepreneurship (Wilken, 1979). The first phase is when a person is motivated to start a business, she may have some ideas about her business, but she has not yet started to take any practical steps to set up a business. During this period the business idea is developed, and social support is sought. This is done through discussions with other people. The second phase means that entrepreneurs start planning the business in detail, this includes working on financing the business, setting up business deals, agreements, procuring quarters for the business, etc. The third phase is entered when the business starts operation. This may either be a business that the founder has started on her own, or it may a business that she has taken over from someone else. The boundary between the second and third phase is relatively clear. There is always a date when an entrepreneur starts a business. The boundary between the first and the second phase may be more blurred. However, in this study we have labeled the first phase a motivation phase where the entrepreneur is
thinking of starting a business, and where the second phase is defined as a time when practical steps are done to start a business.

This study uses the concept of phases to allocate respondents to different categories according to their activities. The questionnaire lets the respondents choose a category according to their situation. We do not study the dynamics of the process, which means the time entrepreneurs spend in each phase, and how many of them who go from one phase to another. This study concentrates on the characteristics of the networks of entrepreneurs who are in each phase. This means that the composition of entrepreneurs in each phase depends on attrition rates. Causes and consequences of attrition is outside the scope of this study. Here we concentrate on studying the network properties of persons who are in each phase. We know that some of them may not be able to go to the next phase, this makes differences between each phase less visible than following the process dynamically. However, if we find differences, they may be caused by important differences that are crucial for the entrepreneurial process.

During the founding process an entrepreneur will need different resources, which can be accessed through a social network. An entrepreneur's position in social networks may determine the outcome of the founding process (Aldrich & Zimmer, 1986; Aldrich, Rosen, & Woodward, 1986) and it may determine the resources that may be available in social networks in entrepreneurial contexts (Johannison, 1988). An entrepreneurial context is created when there are several business foundings in an area. This corresponds to the increase in founding rates that is observed with rising density of firms (Hannan & Freeman, 1987; 1989). Rising density of firms in an area means that there will be more persons in social networks who posses information and knowledge that is necessary to start firms. This facilitates diffusion of knowledge and makes it possible for more persons to start their own businesses. How people use networks and their position in networks influence who will be likely to establish a firm.

Social position in networks determines what kinds of other actors (alters) entrepreneurs are able to reach through direct contacts. The position of actors and relations among actors determine
the market position and the content of available information. The diversity of information depends on relations among alters, where close connections among alters may lead to a high degree of redundancy of information (Granovetter, 1973; Burt, 1992).

We do not know how many people have viable business ideas that they are not able to realize, because at some time in the process they cannot get further because difficulties in the establishment process are not overcome. We know that many newly established businesses only live for a few years (Hannan & Freeman, 1977; Nystrom & Starbuck, 1981; Brüderl & Schüssler, 1990; Fichman & Levinthal, 1991; Hannan & Carroll, 1992). This may suggest that they may have been started on unrealistic assumptions, lacking essential business relations, or that they are not able to mobilize and organize their resources efficiently.

Starting a business requires more knowledge and economic resources than entrepreneurs control. The lacking resources are called complementary assets (Teece, 1987), they supplement the resources of the entrepreneur. To acquire complementary assets the entrepreneur must know where they are available and how they can complete his resources. Knowledge about complementary assets is not readily available, it is available through other people. They have to be accessed actively by entrepreneurs using their social connections. Entrepreneurs have to organize knowledge and other factors of production and put them into their context so that the information will be useful.

HYPOTHESES
Focusing on the social context of entrepreneurs, networks can be described by size, activity, density, distance, centrality, and multiplexity (Aldrich, 1988; Aldrich & Zimmer, 1986; Scott, 1991). Economic actors are tied up in social relations that may influence available decision alternatives and choices. Persons with whom a prospective entrepreneur interacts, may contribute information or resources that are conducive for a business founding. The information may increase the knowledge base or competence of the entrepreneur. Therefore, entrepreneurs should be located in a network where information redundancy is not a problem. This study will
compare network structures in terms of minimizing redundancy as a key to successful entrepreneurship (see also Burt, 1992).

Size of network and time used for networking

The position people have in networks may put them in a more or less advantageous position to secure information about complementary assets and to use their contacts to realize business ideas and establish economic relationships with other people and organizations. The number of contacts, the background of the contacts, how actively entrepreneurs use their networks, and network characteristics indicate possibilities of mobilizing complementary assets.

The size of the network indicates how many different people an entrepreneur is talking to during the establishment process. A high number of people indicates possibilities of receiving diversified information. If we assume that goal directed information search is difficult and that chance is essential in procuring information (March & March, 1978), a high number of network persons increases the chances of receiving useful information. Therefore, the size of the network may be one of the most important variables explaining the successful establishment of new businesses.

Connected to size, but also independent of size, is the time people spend developing and maintaining network contacts. With a large network the time for each person may be smaller, with a smaller network a person may use more time together with each person. By chance, there may be a better chance of picking up useful information by spending a smaller amount of time with a higher number of persons. However, the amount of time spent on networking may always increase the chances of receiving useful information and learning through dialogues with other people (Brown & Duguid, 1992).

H1A\textsuperscript{4} Large networks and time spent on establishing and maintaining contacts are conducive to entrepreneurship, i.e., entrepreneurs in later phases of

\textsuperscript{4} All hypothesis are stated in the alternative form, and not as 0-hypothesis, which are tested.
the establishment process have larger networks and use more time to establish and maintain network contacts than entrepreneurs in early phases.

**Network density**

All networks are characterized by clustering. In a larger social network that encompasses a larger social space, as e.g. a community, there are several clusters, each of the clusters may be related to certain types of interactions, so that people involved in a variety of activities may also be part of several clusters (Scott, 1991). People running a business may be part of one or more clusters that consist of other business people. It is difficult to set borders around clusters or networks, there will always be some connections between clusters. However, for practical purposes we have to set borders. In this study networks are defined from a focal person’s perspective, we are studying ego-centered networks. Descriptions of networks is therefore a description of the closest environments of our respondents, or the clusters to which they belong. Their relative position (central or peripheral) will therefore determine a variable as network density (defined in the next paragraph). People founding a business will have to try to establish connections with business clusters. They may or may not be part of such clusters, unless their families, friends, or former school mates or colleagues are running their own businesses.

Density is defined as the total number of lines, $l$, or number of actual contacts among people in a network divided by the total possible number of relations:

$$\text{Density} = \frac{l}{\left[ n(n-1)/2 \right]},$$

where $l =$ number of lines among contacts

$n =$ number of contacts (alters) in network

Density refers to how tightly connected the persons in a network are to each other. A network (or a cluster) where everybody know each other has a high density (density= 1.0 or 100% if everybody knows everybody; this defines a clique). This means that the members to a large
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extent may share information. Contacting other persons in a high density network means that the amount of overlapping information may be high as information diffuses rapidly in a high density network. In other words: there may be high redundancy of information.

However, redundancy may depend on the background of one's contacts or the degree of homogeneity of one's network in terms of what occupations and experiences that are represented. To help establishing a business entrepreneurial experience is crucial, and availability of this experience may depend on the level of entrepreneurial activity in a particular environment. Areas that are characterized by a relatively high number of self-employed people tend to have higher founding rates than other areas (Johannison, 1988). This is in line with studies showing increasing founding rates with increasing density in different niches (Hannan & Freeman, 1989; Hannan & Carroll, 1992).

A network with low density means that the contacts (alters) of the focal person (ego) in the network do not know each other well, and therefore, the probability of redundant information is lower. Redundancy is also a function of the degree of homogeneity of the network persons in terms of occupational background and experience. Another problem is their willingness to share information. The latter is rarely a problem in high density networks, which maybe a clique (Scott, 1991). One advantage with low density networks is that each alter may link ego to other clusters that are not usually connected to each other, such links are called a bridge as these alters may connect two subgroups (Mintz & Schwartz, 1985). In high density networks the contacts of one's primary contacts (alters) tend to be people to whom one is already connected. In low density networks indirect contacts generally do not belong to one's established contacts. This means that a low density network may give access to many people through bridges and thus less redundant information (Granovetter, 1973, 1974, 1982; Burt, 1992). A central location in a local cluster means that information is available through many direct contacts. A central location is called a peak. Getting access to other clusters is always most effective through central persons in other clusters. Bridges may connect the entrepreneur to other clusters giving access to crucial resources (Mizruchi, 1982), but
information search may take a longer time. Figure 1 illustrates the bridge concept.

Using networks means that entrepreneurs have to discuss their business idea with several people. The basic idea will be exposed and other people may copy the idea. The possibility of imitation depends on the complexity of the idea, the competence of the entrepreneur, and the properties of the network. If the entrepreneur possesses ideas and competence that are easily copied, then the idea is based on "a hollow shell" (Winter, 1987), which may not be viable. However, if entrepreneurs have a comparative advantage in terms of competence, ideas, and ability to mobilize and combine own and complementary assets, the business idea may not be easily imitated. This gives the entrepreneur a longer lead time over imitators (von Hippel, 1988). In low density networks each contact person will not know the other network persons, and therefore, they may not see how their contributions are used in combinations with other resources. This allows entrepreneurs to discuss parts of their business ideas and problems with other people and gain access to complementary assets without their discussion partners being able to appropriate his/her ideas. A low density network protects the basic business idea.

When entrepreneurs search for information and business connections during the establishment phase, they may have to develop contacts with people who do not belong to their established network, therefore, it is expected that during phase 2 networks will have a lower density than in phase one, where entrepreneurs are expected to access primarily well known people. If entrepreneurs in phase 3 (running a newly established firm) get access to a cluster of business people, the density of the network may again be higher, depending upon the time it takes and the degree to which entrepreneurs are integrated into business networks.
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The redundancy argument favors low density networks, arguments based on support by business communities favor higher density networks. In the earliest phase of entrepreneurship high density networks may offer the entrepreneur mainly social support. However, later phases will probably require lower density networks to be able to successfully establish a firm.

H2A Low density networks are more conducive to entrepreneurship than higher density networks, e.i., individuals in later phases of the establishment process participate in lower density networks than individuals in earlier phases.

Distance and indirect contacts

To get information and access to resources entrepreneurs may find it easier to contact people who are close to them. Distance refers to the number of relations a focal person has to go through to reach a specific person in a network. A distance of two is 1) a relation between ego and a friend (alter), and 2) a relation between the friend and his alter. The closest contacts may not always be able to provide the information or resources entrepreneurs require, therefore, it may be necessary to access contacts that are friends of one’s own friends, or part of their network. This is called indirect contacts, they have a distance of two from the entrepreneur, who has to go through one alter (direct contact) to access them.

Centrality refers to a person's position in a network, where a central person can reach many persons at a short distance within one network or a cluster (Scott, 1991). A peripheral person may reach fewer persons within the same cluster and the distance to the central persons may be greater. However, peripheral persons may be connected to other clusters, and this makes the distance to other clusters shorter. Such couplings are defined as connections within low density networks, which means that peripheral persons may access several different clusters. In terms of gaining less redundant information this may be an advantageous position, because the focal person or her closest contacts act like linking pins among clusters. It is particularly advantageous to the extent that the focal person can exploit the resources of different clusters through indirect contacts.
H3.1A Knowledge of the networks of primary contacts (indirect contacts) gives access to a larger variety of resources, increasing the probability of successfully founding a firm, e.g., entrepreneurs in later phases of the establishment process have better knowledge of indirect contacts than entrepreneurs in earlier phases.

Hypothesis H3.1A specifies a knowledge of alters’ network, however, it does not exclude contacts within high density networks, which may mean that all direct and indirect contacts may to a large extent share the same information. A more effective link is a bridge to another cluster. A bridge is defined as a node that connects two clusters (Mintz & Schwartz, 1985; Scott, 1991), see figure 1. The point is that a bridge connects persons including their alters, which means that two clusters are connected by a bridge. The number of bridges of an entrepreneur increases information diversity.

H3.2A Entrepreneurs in later phases of the establishment process have a higher number of bridges than entrepreneurs in earlier phases.

Background of network contacts

There are two dimensions to the background of network persons. One is related to the social context of the network, or what types of relations the alters have to ego, as e.g. family, friends, work relations, etc. The other dimension is related to the personal characteristics of the network persons, which reflects what kinds of resources they may contribute. Networks will be congenial to entrepreneurship if they are embedded in an entrepreneurial context, because that means that relevant information and resources are available to prospective entrepreneurs (Johannison, 1988). Hypothesis H4A is related to the type of social relations that exist between ego and her alters, which is independent of the personal characteristics of the network persons, but it relates to the social environment and type of interactions where entrepreneurs find their most important network contacts (Brown & Duguid, 1992).
H4A Work related contacts are more conducive to entrepreneurship than other types of social relations, i.e., entrepreneurs in later phases of the establishing process have a higher share of work related contacts than people in earlier phases.

The second background factor is the personal characteristics or properties of the network persons in terms of their competencies. They must have the necessary knowledge and dispose resources that are demanded by entrepreneurs (Johannison, 1988; Rogers & Larsen, 1984). Therefore, it is necessary to study the background of the network persons. Persons with a business background as founders or as business managers have more to offer prospective entrepreneurs than persons without this experience. Therefore, the occupational background of network persons may indicate the type of resources they are able to convey.

H5A Occupationally active network persons, and particularly persons in management positions are conducive to entrepreneurship, i.e., entrepreneurs in later phases of the establishment process have a larger share of occupationally active people and persons in management positions in their networks than people who are in earlier phases of establishing a business.

The scope of the study

The above discussion specified the composition of favorable network structures for entrepreneurship. Network dimensions that we find crucial for acquiring complementary assets are the size of the network, time spent on developing and maintaining contacts, density, availability of indirect contacts and bridges to other clusters, the type of social relations with the network persons, and the occupational background of the network persons. The latter shows what kind of resources they may offer an entrepreneur.

The hypotheses specify conditions that are conducive to entrepreneurship. We expect one or more of the hypothesized conditions to increase the probability of successfully going from one phase of the establishment process to the next and eventually establish and run a firm. This means that the most successful entrepreneurs will have networks that have the hypothesized
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properties. We assume that during the establishment process, entrepreneurs without efficient networks will give up founding their own business. This selection mechanism will be visible in the characteristics of entrepreneurs who have established a firm, because this group of entrepreneurs will have more people with efficient networks than other groups. This research do not try to estimate transition probabilities from one phase of the process to another. This paper concentrates on properties of networks that are conducive for entrepreneurship, and a cross-sectional approach will be sufficient for this purpose.

METHODS

Sample
The respondents are selected among persons who applied to participate in courses in establishing firms, whether they attended the course or not. Two different courses were used to sample respondents. One was offered by the Regional College in Rogaland, Stavanger, Norway, and the other by the Technological Institute, Bergen, Norway. 51.1% of the respondents come from the first sample. 106 persons replied, and the response rate is about 55%. Average age is 34.4 years. 60.8% of the sample are male. 58.2% have college degree or some college education. 46.8% of the respondents have fathers who are running a firm and 20% of their mothers run a business. This indicates that many respondents come from an entrepreneurial background. The percentage of self-employed persons in Norway is below 4%, which is low compared to other industrialized countries in OECD (5% is more common).

The sample is not a randomly drawn sample of all entrepreneurs in Norway. However, there are indications that the key measures are comparable to most studies of entrepreneurs. All the variables measuring network structure and activities have similar distributions as the samples from Italy, USA, Sweden, and Japan that are done using the same questionnaires. Comparisons to other studies indicate that this sample may be representative of entrepreneurs as it matches the findings of most other studies (Aldrich, Reese, & Dubini, 1989).
Missing data is a problem for some of the questions. Many of the respondents only responded to some of the questions and skipped other questions. It is difficult to say why this happened. Some of the respondents did not have any immediate plans of establishing a firm, they were motivated but so far they had not developed extensive networks. This may be one reason they have skipped some of the questions. Missing data will be analyzed when going through the measures.

Measures

A questionnaire was administered to respondents with questions about their networking activities over the past six months. The most important measures are shown in table 1. The dependent variable uses two questions (their phase in the establishment process, and their present occupational status) to divide the respondents in three groups according to their phase in the establishment process (the dependent variable). It was possible to classify 100 persons. The first group has ideas and is motivated to establish a business, but they have not started actual planning or preparations for founding a business (34%). The second group is in the process of planning and establishing a business (22%), and the third group is running a business (44%) that they have established or taken over. The average age of these businesses is 3.8 years, median is 3 years.

As this is a cross-sectional study, the dependent variable, phase of the entrepreneurial process, is a measure of the status of the respondents when the data were collected. They change status over time. Within each group some people are closer to the actual founding of a firm than other people, and some people may stop or fail the organizing of a new business and drop out of the process. Therefore, we do not know how far within the different phases each respondent is, or how many will drop out at any given time. A dynamic study can trace the time dependence of the founding process and the probabilities for successfully completing the different phases of the process.

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insert table 1 about here

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Table 1 shows distributions of the dependent and independent variables. At the bottom of the table is an analysis of missing data. The independent variables are derived from responses to 8 questions. Some of the respondents have not answered all the questions. Most of the missing data are connected to Phase 1 respondents, who are motivated to start a business, but who have no specific plans. On average there are 14 of 34 respondents who are discussing their business ideas with other people, and who have answered the networking questions. There is a mean of 18.25 respondents from Phase 2 of 22 respondents in this category. Phase 3 respondents have a mean of 34.5 responses of 44 in this group. The standard deviations are small. The missing responses to some of the questions of the business owners is hard to explain, they may have felt that the questions were directed to establishing a business even if the questionnaire is clearly directed to all groups of entrepreneurs.

There are 60.8% females in the sample, they have relatively more respondents in phase 1 (39% vs. 26%) and phase 3 (50% vs. 43%) than males. The number of missing responses is higher among females in phase 1 than males, almost 2/3 of the respondents did not answer all of the questions vs. 1/3 of the males. This gives a proportion of females in all measures between 63% and 68% (mode is 63). Only one measure has a significant difference between males and females: number of family members in the network where averages are for females 1.32 and males 0.54.
RESULTS

To test the hypotheses about network structure the analysis first shows some ANOVA tests of differences among the groups, then we shall present a multivariate analysis. Table 2 is a test of H1A, it shows distributions among the groups of number of contacts in the network with whom they have discussed establishing a business, number of hours used per month to establish contacts, and number of hours per month to maintain contacts.

Table 2 shows that there are significant differences among the groups with regard to network activities. The results support hypothesis 1A. The significance is marginal regarding number of hours maintaining contacts per month. The largest difference is between group 1 and the other groups. It looks like prospective entrepreneurs keep a much smaller network informed about their early plans than people who are in later phases of the establishing process. The former may primarily seek social support for their ideas, and they may not have realized the complexity of mobilizing and organizing complementary assets. During the first phase they may not even have realized what kind of resources is needed to establish and run a firm.

To measure density of the networks we asked the respondents to indicate how well each primary contact knows the other persons in the primary network. We divided each response in three categories, "knows other person: 1) very well, 2) somewhat acquainted, and 3) does not know other person." Answers in categories 1 and 2 suggest a link among the network persons. The link is either a strong link (they know each other well), or a weak link (they are somewhat acquainted). Calculating density means that we divide all actual links among the network persons by the possible number of links, see p. 8.

As all network measures are ego-centered, only relations that are directly connected to ego are visible. Therefore, our density measure reflects the density of the primary network of ego and it does not reflect the density of the total network encompassing ego including direct and
indirect links. Our measure of density does not include the direct relations among ego and alters, only density of relations among alters (Scott, 1991). Including the direct relations among ego and alters would just add a constant to the density measure and that does not affect testing of hypotheses. This is the common practice for measuring density in ego-centered networks (Scott, 1991).

According to H2A we expected entrepreneurs establishing or running a newly established firm to have lower density networks than people in earlier phases of the establishing process. Analysis of variance showed that there were no significant differences among the groups of entrepreneurs. The density measures were 0.692, 0.639, and 0.636 for respondents motivated, planning establishment, and running a newly established firm (F=.158, p=.854). The hypothesis was not supported.

H3.1A predicted that entrepreneurs knowing the network of their alters may have a high probability of founding a firm. Knowing the network of alters means that ego knows the most important contacts of her alters. This extends the network to include people within a larger distance, here it is two steps from ego. In figure 2, the networks A, B, and C have 9 persons who are such indirect contacts, where alters a, b, and c act as linking pins. It does not necessarily mean that ego has been introduced to them, but knowing about them is a first step to increase one’s network size. Table 3 shows the number of primary network persons whose networks are known by the respondents. The table shows the number of contacts whose networks the respondents know well (good) or have some knowledge of. The maximum possible number is five. Table 3 shows that H3.1A is not supported. A test of statistical power with alfa at 0.05 showed that the least significant number of observations for good knowledge is 388, and for some knowledge it is 223.
This test does not exclude knowledge of alters’ networks where alters know each other, which means that all direct and indirect contacts may be part of the same cluster. To test if relations to alters are links to different clusters we have to ignore high density networks among alters. A low density network means that the alters do not know each other. In a low density network where ego has knowledge of the network of the alters, each of the alters may act as a link to another cluster. This increases the possibility of receiving nonredundant information. Figure 2 shows network structures where alters (a, b, c) are linking pins to other networks (Networks A, B, & C). However, the way the questions about indirect contacts were asked, does not exclude that people at the end of the bridges are directly known to ego. E.g. persons 1 and 2 are directly linked to ego and also to alters a,b, and c. They may not have been included among the five most important persons, and therefore, they artificially appear to be linked to alter but not to ego, as person 1 and 2 in figure 2. We also do not know if the people in alters’ network are directly linked to other persons in Ego's primary network.

To test the extent of alters being a possible connection or a bridge to other networks, we generated a variable called ‘bridges’ for each respondent. The variable shows how many alters who were not connected to the other alters where the respondents know the network of each alter well. This is a test of hypothesis 3.2A.

The results of the analysis showed that this strict condition was only satisfied for three respondents with a total number of five network persons (alters). Only rarely are the respondents connected to different clusters through other primary contacts. This shows that knowledge of the network of alters to a large degree may depend on the alters knowing each other somewhat, which is a weak tie. This means that indirect links are rare in 0.0 density networks, but more common in higher density networks with weak ties. As several respondents gave information of fewer than five primary contacts, the size of the primary network as measured in this study may not have produced this effect. This shows that most of
our entrepreneurs are operating in small networks with some connections among most of the persons.

Another analysis was made where bridges could be relations to alters who know other alters 'somewhat' or 'not at all', and where the respondents know the networks of the alters well. This definition includes alters with weak ties among other alters. Table 4 shows the number of alters where ego knows alter's network persons well by phase in establishment process. The rows of the table show the percentage of respondents divided in four categories with 2 or fewer bridges, 3, 4, and 5 bridges by phase of entrepreneurship.

Table 4 is a test of Hypothesis 3.2A. There are statistically significant differences among the groups in the direction of the hypothesis (p= 0.0582 two-tailed). People in the later phases of the establishment process have a higher share of alters acting as bridges than people in earlier phases. Respondents in phase 1 have either four bridges (55.6%) or 2 bridges (33.3), while respondents in phase 2 have mostly four bridges (53.3%). The largest number of respondents in phase 3 has five bridges. Knowledge of the network of one's primary network may increase the potential size of one's own network giving access to other clusters. The significant differences are in the distribution of the number of bridges, the average number of bridges compared across the groups is not significantly different, due to small sample size. A power test showed that the least significant n is 131.

Hypothesis H4A predicted that persons who are in the later phases of the establishment process, have a larger percentage of a work related contacts than people in the earlier phases of entrepreneurship. The respondents were asked to indicate type of contact for the five primary network persons, i.e. what relation they have to the respondents. Table 5 shows the distribution of type of contacts or the kind of relation they have to their primary network persons. The table shows percent of contacts classified as family contacts, friends, and work
or business contacts.

----------------------------

insert table 5 about here

----------------------------

Table 5 shows that all groups have the highest number of relations from work or business with contacts classified as friends in between. Family contacts play a minor role, which is surprising compared to the high number of parents that run their own businesses in this sample. There are no significant differences among the respondents in different phases of the establishment process, which means that the relations that alters have to egos is not important, H4A is therefore rejected. H5A tests for occupational background.

Question 11 asked the respondents to indicate the occupation of their five primary contacts. Most of them (78%) are placed in three occupational groups. 21% of the contacts are professionals (academic education) in technological or humanistic subjects. The next group is composed of managers in private and public organizations; this is the largest group, 36%. Different service occupations have the same share as professionals, 21%. The remaining occupations, labeled ‘other occ.’ in table 7, represent a variety of trades and crafts, most of them indicating lower levels jobs or independent craftspersons. They include management in agriculture and forestry, ship officers, textile workers, precision mechanical work, wood work, construction work, graphic work, glass, ceramic and clay work, stationary engine and motor-power work, freight handlers, public safety and protection work, waiting work, building caretaking and char work, and hairdressers.

To investigate the distribution of occupations across the primary network, each response for each network person was aggregated to represent a total distribution of occupations. There were 279 responses (total no of network persons of all respondents) for which the occupation was given. This is a test of Hypothesis H5A.

----------------------------

insert table 6 about here

----------------------------
Table 6 shows the distribution of all occupations of primary network persons by phase in the establishment process. There are significant differences among entrepreneurs in the different phases of the establishment process. Group 3 respondents, people running a firm, have a higher fraction of managers in their networks, and they have a higher number of different occupational groups among their contacts than the other groups. This suggests a composition of the network of people with a more direct business background than the network of people planning establishment. There is a broader resource base within the networks of phase 3 entrepreneurs with better opportunities to mobilize complementary assets. Group 3 respondents have fewer contacts with professional or technical academic background than group 2, where this is the most important occupational background of primary network persons. Phase 1 entrepreneurs (motivated, but no specific plans) concentrate their network contacts among managers and people with 'other occupations'. The main difference between people in phase 1 and 3 is that phase 1 has more people from ‘other occupations’, and phase 3 has more people from service occupations. Table 6 indicates that entrepreneurs in phase 3 have more people with a managerial or vocational background that are directly relevant to running businesses, than respondents in other phases. This is either an indication of a favorable network composition or of a change of networks in that direction during the establishment process. Compared to Hypothesis H4A this test shows that background in terms of occupations, is more important than the type of relationship alters have to egos.

A multivariate analysis can show how much of the variance among the groups of entrepreneurs that can be explained by network variables. This is also a simultaneous test of all hypotheses except H4A and H5A. Number of persons in the network is an indication of the size of the network. The variables measuring time to establish contacts and time used to maintain contacts indicate network activity, but they are strongly correlated (Rsquare= 0.57) and only the former variable will be used. Knowledge of indirect contacts shows the potential of gaining access to other networks, and density (low density) shows the potential of

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5. Making an index of the sum of the variables HRSDEV and HRSMAN produced an unstable independent variable.
Networks and Entrepreneurship

less redundant information from the network.

Table 7 shows the results of the logistic regression analysis. The model that is fitted shows a maximum likelihood estimation of log likelihood of each variable to predict if respondents belong in phase 1 (no immediate plans) or phase 2 (preparing establishment) based on phase 3 (running a newly founded business). The R square (U) is the uncertainty coefficient. Analysis of log likelihood shows how well the model fits the data. C Total is log likelihood (negative) based on zero slopes or no fit at all. The Lack of fit analysis\(^6\) has been made. None of the models had a significant lack of fit. This shows that despite the degrees of freedom and the number of cases, there is enough variation to calculate stable regression coefficients. The lack of fit can also be used to check if there may be any benefits of adding more variables into the equation. It is based on a computation of effects of invariance, or the effect of having many respondents with the same responses across several variables, which gives unstable regression coefficients. The program, SAS-JMP, will flag a warning if there are unstable coefficients.

The parameter estimates are log likelihood of each variable, an increase of one unit increases log likelihood of belonging to phase 1 or 2 by the parameter estimate. The full model has RSquare= 0.27. Wald ChiSquare tests of each variable may show their fit to the model, however, such estimates are unreliable and have been omitted. The best way of determining the contribution of each variable is to delete it from the model and compute a new logistic regression model, subtract the Model ChiSquare from the full model ChiSquare, and see if the difference shows a significant change in model fit.

Four tests were made taking out one independent variable at a time and estimating Model ChiSquare, subtracting it from Full Model ChiSquare. Table 7 shows the results. Two variables, NUTALK and HRSDEV, have significant contributions to the model.

\(^6\) This is a negative goodness of fit analysis.
The model explains 27% of the variance among the groups. The variable NUTALK has the best ability to distinguish among entrepreneurs in different phases of establishing a firm followed by HRSDEV. None of the other variables have statistically significant parameter estimates. The significant differences are between respondents in phase 1 and phase 2. There are no significant differences between respondents in phase 2 and 3.

DISCUSSION AND CONCLUSION

This study has analyzed data from a cross-sectional study using a questionnaire to measure structural characteristics of networks and networking activities of a sample of Norwegian entrepreneurs. We have also analyzed relational content and properties of network persons to indicate types of resource bases. The respondents were divided into three groups according to phase of the establishment process (Wilken, 1979).

Hypothesis (H1A) about number of contacts and time spent networking received support. The main differences were between respondents in phase 1 and the two later phases, which were not different in terms of network size and time spent with contacts. The hypothesis about density (H2A) did not show any significant differences among the three groups of respondents. All respondents belong to fairly high density clusters, average density is 64.6%.

Two hypotheses were related to distance between ego and alters’ networks. H3.1A tested if knowledge of indirect contacts (the contacts of alters) were dependent on entrepreneurial phase. Knowledge of the networks of alters did not differ among the groups of entrepreneurs, thus H3.1A was not supported. However, hypothesis H3.2A, which claimed that people in later phases of entrepreneurship would have more bridges to alters’ networks, was supported.
This means that people in later phases have a better knowledge of indirect contacts that are not part of dense clusters. The operationalization of bridges specified weak relations among alters to assess a position as a bridge to another cluster.

H4A predicted that work (or business) related contacts were more frequent among entrepreneurs running a firm than people in the establishment phase. The hypothesis was not supported. However, testing for occupational background of alters (H5A) was in accordance with the hypothesis. Test of hypothesis H5A showed that entrepreneurs running a business had a higher proportion of managers and people with different vocations than people who had not established a firm. People in the planning phase had a high share of professionals in their networks. This shows that background is important (H5A) while the type of relationship as e.g. friends, family, or work related, is not important.

This study has shown that the size of the network and time used networking (time spent establishing and maintaining contacts), having alters acting as bridges, as well as the occupational background of relations to the primary contacts distinguish the three groups of entrepreneurs. All variables connected to the size of the network, or the potential size counting indirect links, showed significant differences among the three groups of entrepreneurs according to their phase in the founding process. People in later phases have larger networks that are used to a greater extent.

The variable describing a structural property, density, did not distinguish the three groups. Density of networks may benefit entrepreneurs in two different directions. On the one side, a low density network has less redundant information than a high density network, but a high density network diffuses information more rapidly than a low density network. Density is also an indication of cohesion in groups (Scott, 1991). Trust is developed and sustained in cohesive groups. Networks may be characterized by dense clusters where access for outsiders is difficult due to competition for scarce resources. Business clusters may be such protected clusters making access for newcomers difficult. Lack of trust may be a reason for failing to
establish connections. Axelrod (1984) shows that establishing trust means that actors take long term relations and continued exchange into consideration, and that cooperation develops as a natural basis of social exchange. Trust is necessary to develop cooperation, and trust is a control mechanism through social norms (Bradach & Eccles, 1989). Therefore, both weak ties in low density networks and strong ties in high density networks may be beneficial to the entrepreneurial process.

One important question that remains to be answered is whether the particular mix of occupations that are present among people running newly started businesses has changed as a result of the business founding process or if this composition of alters is more conducive of successful entrepreneurship throughout the establishment process than other combinations of occupations. If networks change according to the phase of the establishment process, the table shows in what direction change takes place. If networks are stable, the table may show what composition of alters is more effective during the establishment process. Probably, there is an element of both stability and change of networks.

As this is a cross-sectional study we lose the dynamic aspects of business foundings and development of social contacts. We do not know if the entrepreneurs who have established a firm, have succeeded because of a larger and more diversified network throughout the founding process or if the network has become larger and more diversified during the founding process. The high variance within each group shows that among respondents in each group there are large differences in network characteristics and activities, and this may suggest that networks may not change much during the founding process. A cross-sectional study cannot capture the dynamics of changes within each group. We may have respondents within each group with a higher or lower probability of going from one phase to another. We do not know if successful transition depends on how the actors are able to develop their networks or if it depends on their initial network position. Probably both conditions may explain entrepreneurship. A longitudinal study can distinguish between these possible explanations. It also may be able to estimate transition probabilities and contingencies for
transition to another state (going to another phase or dropping out of the founding process).

A cross-sectional study loses the ability of a dynamic study to capture critical time dependent contingencies for going from one phase of the process to another phase. We do not know how the time needed to establish a firm is affected by network structures and activities, and we do not know how many potential entrepreneurs who do not complete the establishment process, but we know that the failure rate of newly established firms is high. This may be because they are not able to develop sustainable business relations where the combination of own competencies and resources and deployment of complementary assets have comparative advantages that make the firms survive. We need more research to describe the development and composition of efficient social structures that are conducive to entrepreneurship and running of businesses.

This study shows the importance of social networks for founding a business, and it also highlights the importance of pursuing a network perspective for future studies. Other research has shown the importance of networks in general economic activities which are embedded in social and political systems (Granovetter, 1985; Burt, 1992; Mizruchi, 1992). Network analysis not only offers a methodology for studying social relations, it also offers theoretical perspectives on social processes, as contagion models by cohesion or structural equivalence (Galaskiewicz & Burt, 1991), and network theories of competition and entrepreneurship (Burt, 1992), networks of elites and decision making (Knoke, 1993; Laumann and Knoke, 1987), and networks of interorganizational relations including innovations (Mizruchi & Galaskiewicz, 1993; Johanson & Mattson, 1987; Håkanson, 1989).

This study shows entrepreneurs the importance of social networks for establishing a firm, where entrepreneurs can use their relations for mobilizing complementary resources, getting support and help, and establishing viable business relations. Based on this research, entrepreneurs should have large networks and use much time with their relations. It is important to belong to a relatively dense cluster, where the relationships contain trust, and
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where the alters have a variety of business related competencies and connections from their work. It is also important to have a number of weak relations, or bridges, that may connect the entrepreneur to other clusters, to get nonredundant information. Bridges may also introduce entrepreneurs to other resource persons which may lead to establishment of new business relations.
REFERENCES


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FIGURE 1
A bridge that connects two peaks.
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Figure 2
Network connections between ego, alters, and alters’ networks

Alters who are part of ego’s network and who are part of other alters’ network (indirect contacts)
TABLE 1

Distributions of variables used in the analysis, including analysis of missing data.

<table>
<thead>
<tr>
<th>Variable Description</th>
<th>Mean</th>
<th>Std. dev.</th>
<th>n</th>
<th>q. no</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 NUTALK (no. of persons in the network)</td>
<td>6.09</td>
<td>6.97</td>
<td>76</td>
<td>4</td>
</tr>
<tr>
<td>2 HRSDEV (no. w/ hours develop network)</td>
<td>2.93</td>
<td>3.97</td>
<td>61</td>
<td>5</td>
</tr>
<tr>
<td>3 HRSMAN (no. w/ hours maintain network)</td>
<td>1.81</td>
<td>2.86</td>
<td>61</td>
<td>6</td>
</tr>
<tr>
<td>4 DENSITY</td>
<td>64.47</td>
<td>30.93</td>
<td>67</td>
<td>10</td>
</tr>
<tr>
<td>5 LINKS (no. of persons connecting cliques)</td>
<td>3.2</td>
<td>1.58</td>
<td>70</td>
<td>11</td>
</tr>
<tr>
<td>6 Knows network well of no. persons</td>
<td>1.78</td>
<td>1.30</td>
<td>73</td>
<td>11</td>
</tr>
<tr>
<td>7 Knows network very well of no. persons</td>
<td>1.47</td>
<td>1.41</td>
<td>74</td>
<td>11</td>
</tr>
<tr>
<td>8 Background of 5 closest network persons:</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Family</td>
<td>0.82</td>
<td>1.18</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>1.29</td>
<td>1.37</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>Work related connections</td>
<td>1.81</td>
<td>1.59</td>
<td>68</td>
<td></td>
</tr>
</tbody>
</table>

Occupations of network persons: see bottom marginals table 7  

DEPENDENT VARIABLE: Phase in establishment process (ENTREP)  

Including analysis of missing data on 8 questions measuring independent var.

<table>
<thead>
<tr>
<th>Phase Description</th>
<th>No. resp.</th>
<th>Mean resp.</th>
<th>Std. dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1 (motivated)</td>
<td>34.0</td>
<td>14.13</td>
<td>1.24</td>
</tr>
<tr>
<td>Phase 2 (planning)</td>
<td>22.0</td>
<td>18.25</td>
<td>1.03</td>
</tr>
<tr>
<td>Phase 3 (running a firm)</td>
<td>44.0</td>
<td>34.50</td>
<td>4.28</td>
</tr>
<tr>
<td>n= 100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2

Network activities of the respondents. Number of persons in network, time to develop relations, and time to maintain relations by phase in establishment process.

<table>
<thead>
<tr>
<th></th>
<th>NUTALK</th>
<th>HRSDEV</th>
<th>HRSMAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Motivated</td>
<td>2.25</td>
<td>2.21</td>
<td>0.83</td>
</tr>
<tr>
<td>Group 2: Planning est.</td>
<td>7.35</td>
<td>13.12</td>
<td>11.22</td>
</tr>
<tr>
<td>Group 3: Running a firm</td>
<td>7.23</td>
<td>16.76</td>
<td>8.20</td>
</tr>
</tbody>
</table>

F 3.53* 3.91* 2.89†

n 76 60 60

† p= 0.064
* p< 0.05
two-tailed tests
Knowledge of the network of the five primary network persons. Number of persons and degree of knowledge of networks by phase of establishment process.

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>good knld</th>
<th>n</th>
<th>some knld</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Motivated</td>
<td>14</td>
<td>1.29</td>
<td>15</td>
<td>1.40</td>
</tr>
<tr>
<td>Group 2: Planning</td>
<td>19</td>
<td>1.79</td>
<td>17</td>
<td>1.88</td>
</tr>
<tr>
<td>Group 3: Running</td>
<td>38</td>
<td>1.47</td>
<td>38</td>
<td>1.92</td>
</tr>
<tr>
<td>n and F-test</td>
<td>71</td>
<td>0.55</td>
<td>70</td>
<td>0.95</td>
</tr>
</tbody>
</table>
### Table 4

Number of possible bridges to other networks by phase of establishment. Table shows row percentages.

<table>
<thead>
<tr>
<th>Number of bridges</th>
<th>≤2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Motivated</td>
<td>33.3</td>
<td>11.1</td>
<td>55.6</td>
<td>17.0</td>
<td></td>
</tr>
<tr>
<td>Group 2: Planning</td>
<td>20.0</td>
<td>13.3</td>
<td>53.3</td>
<td>13.3</td>
<td>28.3</td>
</tr>
<tr>
<td>Group 3: Running a firm</td>
<td>20.7</td>
<td>20.7</td>
<td>17.2</td>
<td>41.4</td>
<td>54.7</td>
</tr>
</tbody>
</table>

Column totals: 22.6 17.0 34.0 26.4 100.0

Chisquare= 12.17, p= 0.0582, n= 53.
Distribution of types of relations to alters. Number of alters that are family, friends, or work related contacts, maximum sum= 5.0

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Friends</th>
<th>Family</th>
<th>Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Motivated</td>
<td>14</td>
<td>1.29</td>
<td>0.86</td>
<td>1.29</td>
</tr>
<tr>
<td>Group 2: Planning</td>
<td>19</td>
<td>1.42</td>
<td>0.47</td>
<td>1.84</td>
</tr>
<tr>
<td>Group 3: Running</td>
<td>34</td>
<td>1.18</td>
<td>1.03</td>
<td>2.00</td>
</tr>
<tr>
<td>Total n</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F test=</td>
<td></td>
<td>0.19</td>
<td>1.35</td>
<td>0.998</td>
</tr>
<tr>
<td>Least sign. number</td>
<td></td>
<td>1048</td>
<td>151</td>
<td>204</td>
</tr>
</tbody>
</table>
## Table 6

Occupations of primary network contacts by stage in establishment process, total nos and row percentages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Occ. gr. 0</th>
<th>Occ. gr. 1</th>
<th>Other occ.</th>
<th>Occ. gr. 9</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tech.ac.pr.</td>
<td>Managers</td>
<td>Other occ.</td>
<td>Service occ.</td>
<td></td>
</tr>
<tr>
<td>1. Motivated</td>
<td>7</td>
<td>31</td>
<td>21</td>
<td>21</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>13.2%</td>
<td>37.4%</td>
<td>39.6%</td>
<td>21.1%</td>
<td>21.1%</td>
</tr>
<tr>
<td>2. Planning</td>
<td>17</td>
<td>23</td>
<td>56</td>
<td>36</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>32.2%</td>
<td>27.7%</td>
<td>39.2%</td>
<td>21.9%</td>
<td>35.8%</td>
</tr>
<tr>
<td>3. Running bus</td>
<td>8</td>
<td>14</td>
<td>30</td>
<td>36</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>15.1%</td>
<td>16.9%</td>
<td>21.0%</td>
<td>25.2%</td>
<td>21.9%</td>
</tr>
<tr>
<td>Totals</td>
<td>59</td>
<td>100</td>
<td>61</td>
<td>59</td>
<td>279</td>
</tr>
<tr>
<td></td>
<td>21.1%</td>
<td>35.8%</td>
<td>21.9%</td>
<td>21.1%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

$X^2 = 22.79$  df= 6  p< 0.001
### Table 7

A multivariate logistic regression model predicting phase of entrepreneurship

Dependent variable: Phase of Entrepreneurship

Listwise exclusion of missing values, n= 42 all models.

<table>
<thead>
<tr>
<th>Independent var.</th>
<th>Full Model</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept (phase 1)</td>
<td>2.76</td>
<td>1.07</td>
<td>2.13</td>
<td>3.61</td>
<td>1.51</td>
</tr>
<tr>
<td>NUTALK</td>
<td>-0.86*</td>
<td>-</td>
<td>-0.98*</td>
<td>0.82*</td>
<td>-0.92*</td>
</tr>
<tr>
<td>HRSDEV</td>
<td>-0.18</td>
<td>-0.29*</td>
<td>-</td>
<td>-0.15</td>
<td>-0.19</td>
</tr>
<tr>
<td>DENSITY</td>
<td>0.02</td>
<td>0.01</td>
<td>0.00</td>
<td>-</td>
<td>0.02</td>
</tr>
<tr>
<td>INDIR.REL</td>
<td>-0.48</td>
<td>-0.47</td>
<td>-0.23</td>
<td>-0.51</td>
<td>-</td>
</tr>
<tr>
<td>Intercept (phase 2)</td>
<td>-0.33</td>
<td>-0.11</td>
<td>-0.28</td>
<td>0.60</td>
<td>-1.18</td>
</tr>
<tr>
<td>NUTALK</td>
<td>0.01</td>
<td>-</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>HRSDEV</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-</td>
<td>-0.01</td>
<td>-0.03</td>
</tr>
<tr>
<td>DENSITY</td>
<td>0.02</td>
<td>0.01</td>
<td>0.01</td>
<td>-</td>
<td>0.02</td>
</tr>
<tr>
<td>INDIR.REL</td>
<td>-0.28</td>
<td>-0.27</td>
<td>-0.32</td>
<td>-0.26</td>
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</tr>
</tbody>
</table>

ChiSquare 22.36 13.20 17.76 20.19 20.82
Rsquare (U) .27 .16 .22 .24 .25
Model significance 0.004 0.040 0.007 0.003 0.002
ChiSquare difference Full Model: 9.16** 4.60* 2.17 1.54
** p< .01
* p< .05