

**Networking behavior and contracting relationships among entrepreneurs in business incubators.**

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**Acknowledgments:**

This research has been made possible with the help of the Netherlands Organisation for Scientific Research – Nederlandse Organisatie voor Wetenschappelijke Onderzoek (NWO) – under grant number 400-07-160. The author would like to thank the managers and entrepreneurs of all four incubators for their support, Michiel Resink and Anna Heemskerk for helping to collect the data, and Niamh O’Sullivan for proofreading the manuscript.

**Abstract:**

Many studies focus on the relationship between social networks and performance. I study networking behavior as an antecedent of tie formation among entrepreneurs in business incubators. I distinguish between two types of networking behavior: individual networking orientation or building potentially valuable ties for personal gain, and Tertius Iungens orientation or facilitating tie formation between others. I find that both types of networking behavior are positively related with the number of business partners to whom entrepreneurs give business assignments. Contrary to expectations, I find no relationship between networking behavior and the number of business partners from whom entrepreneurs receive business assignments.

**Keywords:**

Social networks; networking behavior; Tertius Iungens orientation; incubators

**Word count (including references): 9998**

## INTRODUCTION

Within the field of entrepreneurship, which can be defined as the identification, evaluation and exploitation of opportunities (Shane & Venkataraman, 2000), the influence of social networks on new venture creation and performance has been extensively studied (Aarstad, Haugland, & Greve, 2010; Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010). Many studies on social networks originating from the field of sociology focus on tie strength (Granovetter, 1973). In addition, they often apply a structural approach and focus on the extent to which an individual's position in a network brings certain benefits (Burt, 2004; Freeman, 1979). With respect to tie strength, strong ties, which are characterized by high trust, have been found to facilitate transactions and coordination in groups (Coleman, 1988). Weak ties, on the other hand, are valuable in gaining access to new information and new opportunities (Granovetter, 1973). Individuals that are strategically positioned to form – often weak – ties between two disconnected individuals can exploit this position either in terms of combining complementary pieces of knowledge or by acting as a broker (Burt, 1992).

More specifically within the field of entrepreneurship there has been a significant number of studies on social networks. Mostly of these studies focus on the content of network relationships, governance mechanisms, and network structure (Hoang & Antoncic, 2003). For example, having strong ties – family members or close friends that have their own business – are positively related with the chance of becoming an entrepreneur one self. On the other hand, weak ties – membership in business networks – are positively related with profitability (Davidsson & Honig, 2003). However, the majority of extant research focuses on the impact of social networks on performance, in which they treat the characteristics of network ties, the size of social networks, or the structural position within them as independent variables. Moreover, previous

studies have been criticized for neglecting social networks as dependent variables, and not studying network formation or development as a process (Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010).

Therefore, the main contribution of this paper is that I study the relationship between networking behavior by individual entrepreneurs and tie formation. By studying individual networking behavior as an antecedent of tie formation, I respond to calls in the literature to study how the actions of individual entrepreneurs influence tie creation (Slotte-Kock & Coviello, 2010). Studying the effect of networking behavior on tie formation is a first step one needs to take before being able to isolate how occupying a specific structural position in a network, such as for example a central one (Freeman, 1979), influences performance. In addition, I make a distinction between two types of networking behavior. First, networking orientation is an individual propensity to actively try to meet other people from whom one hopes and expects to benefit in the future. Second, individuals with a Tertius Iungens orientation (TIO) have a tendency to facilitate tie formation among (disconnected) individuals in their network when they think these other individuals might benefit from one another (Obstfeld, 2005). Although the TIO construct was originally developed for predicting employee involvement in innovation within the firm, in this paper I show that TIO is also an important construct for analysing relationships between entrepreneurs.

I study the relationship between individual networking orientation and TIO on tie formation in the empirical context of entrepreneurs that are located in business incubators. Business incubators can be defined as organizations that provide office space and central services at a favourable price to firms that are often recently set up (Allen & McCluskey, 1990). More specifically, I study tie formation in the sense of contracting relationships among

entrepreneurs in which entrepreneurs either give to, or receive business assignments from, other entrepreneurs in a business-to-business or factor market setting (Sarkar, Echambadi, & Harrison, 2001). Where early studies on business incubators focus on physical proximity, economies of scale, and cross fertilization among firms that are co-located in incubators (Hackett & Dilts, 2004), more recently there has been a shift towards research on so-called networked incubators (Hansen, Chesbrough, Nohria, & Sull, 2000). Managers of business incubators can facilitate and actively foster the formation of network ties between entrepreneurs in incubators as well as with external business partners (Bøllingtoft & Ulhoi, 2005; Hansen et al., 2000; Tötterman & Sten, 2005).

In contrast to Hansen et al.'s (2000) top down focus on the role of incubator management in facilitating tie formation between entrepreneurs, others take a bottom up perspective showing that co-location in incubators can lead to cross fertilization among entrepreneurs (Phan, Siegel, & Wright, 2005). Firms in incubators benefit from co-location through buying complementary competencies of other entrepreneurs by outsourcing contracts or using the incubator as an internal market place (Bøllingtoft & Ulhoi, 2005; Bøllingtoft, 2012; Campbell, 1989). In order for entrepreneurs to benefit from cross fertilization, incubators depend on “a minimum degree of altruism and collectivism” (Bøllingtoft & Ulhoi, 2005: p. 285). Networking behavior by individual entrepreneurs, especially in the form of TIO, may therefore be an important driver of cross fertilization and the formation of business relationships among incubated firms, since entrepreneurs that score high on TIO will actively link other entrepreneurs in business incubators, and by doing so facilitate the creation of new (combinations) of knowledge, resources and exchange relationships.

This paper will be structured as follows. I will start with a theoretical framework in which I discuss the link between entrepreneurship, social networks, and social capital theory. Next I will discuss networking as a behavioral attribute and distinguish between individual networking behavior and TIO, and how this affects actual tie formation. This will be followed by a review of existing research in the field of business incubation, which is the empirical setting of this study. Next I will present the results of the regression analysis. Here I estimate the effects of individual networking behavior and TIO on tie formation in terms of inward and outward contracting relationships among entrepreneurs in business incubators specialized in the creative industries. The paper will conclude with a discussion and ideas for future research.

## **THEORY**

### **Entrepreneurship, networking orientation, and contracting relationships**

Entrepreneurship can be defined as the identification, evaluation and exploitation of opportunities (Shane & Venkataraman, 2000). Entrepreneurship scholars traditionally focus on individual actor characteristics of entrepreneurs. First, these studies show that entrepreneurs have certain psychological characteristics that distinguish them from others. Entrepreneurs, for example, have a greater tolerance for ambiguity, a larger propensity to take risk (Begley & Boyd, 1987), and a higher degree of self-efficacy compared to non-entrepreneurs. Individuals that score high on “entrepreneurial self-efficacy” have a strong belief in their own entrepreneurial abilities, especially those related to innovation (Chen, Greene, & Crick, 1998). Second, others study the link between human capital, in the sense of skills and competences, and entrepreneurship. For

example, individuals with a formal education and previous start-up experience are more likely to discover new opportunities or start a new venture. However, this does not necessarily mean that they are also more successful in exploiting these opportunities (Davidsson & Honig, 2003).

Entrepreneurship scholars increasingly focus on the positive relationship between social capital and entrepreneurship (for extensive reviews see Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010). Social capital studies are concerned with how social structure facilitates the actions of actors within that structure (Coleman, 1988). This social structure often refers to a social network, which is also illustrated by the definition by Nahapiet and Goshal (1998) who define social capital as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network” (p. 24). Since social capital is a rather broad construct and social networks are a key aspect of social capital, in what follows I will focus more specifically on social networks.

Social network research has seen a tremendous growth over the past decades and in a wide variety of social sciences. Social networks can be valuable because they can provide actors with access to crucial resources, new opportunities, legitimacy, and status (for a review see Brass, Galaskiewicz, Greve, & Tsai, 2004).

Although there is a vast amount of research on network theory one could make a broad distinction between those that study characteristics of the ties and those that focus on network structures. With respect to the former, researchers make a distinction between weak and strong network ties. On the one hand, weak ties such as acquaintances are more likely to be sources of novel information and opportunities such as job openings (Granovetter, 1973). On the other hand, strong ties, such as those with family members, are characterized by emotionally close

relationships, high trust, and joint problem solving (Coleman, 1988; Uzzi, 1997). The second stream of network research is concerned with the structural characteristics of networks and focuses on the relationships between actors occupying a specific position in a social network and the benefits that this position brings to its occupier. Examples of often used structural network measures are the degree of structural holes in one's ego networks (Burt, 1992) and network centrality (Freeman, 1979). Actors whose networks are rich in structural holes occupy a position that allows them to benefit from brokering links between otherwise disconnected others (Burt, 1992). Actors, on the other hand, that occupy a very central position in a network have better access to resources and opportunities than poorly connected counterparts in the periphery (Freeman, 1979). At a fundamental level, researchers criticise the structural approach to network research and show that individual actor characteristics are an important driver of attaining a particular position within a network. First, in studying the antecedents of network centrality, it was found that centrality can, to some extent, be explained by individual personal characteristics (Klein, Lim, Saltz, & Mayer, 2004).

There has also been an extensive stream of research on the effects of social networks specifically in the field of entrepreneurship (for extensive reviews see: Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010). For example, strong ties such as family members and close friends are important in the early phase of setting up a new venture (Greve & Salaff, 2003) because they provide low cost access to critical resources (Starr & MacMillan, 1990). Weak ties such as acquaintances, on the other hand, are more important for spotting opportunities (Granovetter, 1973) and making the new venture profitable within a short period of time (Davidsson & Honig, 2003). In their review Hoang and Antoncic (2003) focus on the content of network relationships, governance mechanisms, and network structure. They find that the

majority of research is on the impact of network structure on performance and note that there is only a limited number of process-oriented studies in which networks are the dependent variable. More recently Slotte-Kock and Coviello (2010) state that a process approach is still lacking and highlight the need to study the process of network development in entrepreneurship research.

In this article, I therefore focus on developing hypotheses about the effect of individual networking orientation as a personal characteristic on tie formation among entrepreneurs. First, I define networking orientation as the propensity of an individual actor to actively build informal social ties from which he or she hopes and expects to professionally benefit in the future. Entrepreneurs on average spent five hours a week developing and maintaining contacts (Aldrich & Reese, 1993). Networking behavior might be especially important for new start-ups to overcome their liability of newness (Stinchcombe, 1965). This is confirmed by a study that showed that entrepreneurs spend more time in developing networks in the early stages of the establishment of the firm (Greve & Salaff, 2003). Second, I study tie formation among entrepreneurs in terms of inter-firm contractual relationships. The argument is that entrepreneurs that score high on individual networking orientation form more weak ties with other entrepreneurs, which, in turn, allows them to spot valuable opportunities for collaboration. When these opportunities are formally exploited through a formal contractual relationship between entrepreneurs it means that these weak ties turn into strong ones.

Shane (2012) defines opportunities as “situations in which it is possible to recombine resources in a way that generates a profit” and notes that although many studies focus on entrepreneurship as the act or process of setting up new ventures, entrepreneurship research has seen little progress in studying entrepreneurship by individual actors in existing firms (p.15). Moreover, firms, and especially the individual actors within them, need to continuously search

for collaboration opportunities with other firms in order to remain competitive. Since entrepreneurship research is concerned with explaining performance difference between actors in discovering and exploiting business opportunities (Shane & Venkataraman, 2000) and social networks provide actors with access to crucial resources and new opportunities, one would expect that entrepreneurs with a strong networking orientation are more likely to monetize their weak ties into strong ones by receiving business contracts from other firms. I therefore hypothesize that:

Hypothesis 1: There is a positive relationship between an *individual networking* orientation and the number of firms from which entrepreneurs *receive* business contracts.

Pro-active entrepreneurs scan their environment in search of valuable opportunities (Lumpkin & Dess, 1996). Organizations do not always have all the required resources they need to successfully compete in product markets and can form collaborative ties with other organizations that possess complementary resources (Chung, Singh, & Lee, 2000). This means that opportunities are not restricted to product markets but can also entail opportunities in factor markets. With respect to factor markets organizations can proactively scan their environment in search of potentially valuable opportunities for partnering with other organizations. Firms that are better informed about the factor market for partners are better at exploiting collaboration opportunities (Sarkar et al., 2001), in which they can leverage their resources (Hitt, Dacin, Levitas, Arregle, & Borza, 2000). In addition, organizations are more inclined to form collaborative ties when there is a certain degree of trust in potential partners based on pre-existing ties between partners (Gulati, 1995). Therefore, entrepreneurs with a strong networking

orientation might be expected to be more aware of potentially valuable collaboration opportunities, and more likely to have established weak informal ties with potential partners before turning them into strong ones in terms of actual collaboration. I therefore hypothesize that:

Hypothesis 2: There is a positive relationship between an *individual networking* orientation and the number of firms to which entrepreneurs *give* business contracts.

### **Entrepreneurship, Tertius Iungens orientation, and contracting relationships**

Entrepreneurs act upon opportunities when they perceive them to be desirable and feasible (Krueger, 1993). The perception of feasibility is the result of an entrepreneur's evaluation of the chance that he or she is able to exploit these opportunities. Past studies on entrepreneurship identify three main possibilities for exploiting opportunities. First, one can set up a new organization. Second, one can sell the idea to another existing organization (Shane & Venkataraman, 2000). Third, when entrepreneurs identify potentially valuable business opportunities that they themselves are not able to – easily – exploit, they can collaborate or form an alliance with others that possess complementary resources (Hitt et al., 2000; Sarkar et al., 2001). Past studies, however, ignore a fourth option in which entrepreneurs identifying opportunities that they themselves cannot easily or directly exploit may inform other entrepreneurs that they are acquainted with, and who are better equipped for this purpose.

Hence, if entrepreneurs are not able to exploit an opportunity, besides ignoring it altogether, they have the option of sharing this valuable information, with another entrepreneur

who is better able to exploit the opportunity, without being rewarded for this apparently selfless behavior. First, this information can be shared with a single entrepreneur who is expected to be able to exploit this opportunity alone. Second, when an entrepreneur sees opportunities in terms of complementary resources, that can be exploited in alliances among others, an entrepreneur can share this information with either one or both of them. This behavioral characteristic of facilitating coordination between actors within one's social network, when one believes these actors could benefit from collaboration, is termed a Tertius Iungens orientation (TIO) (Obstfeld, 2005).

Obstfeld contrasts the TIO construct with a Tertius Gaudens orientation (TGO) in which individuals aim to profit directly by acting as a broker between two individuals that are disconnected within the network. Most previous studies focus on brokerage and show that individuals with networks that are rich in structural holes, or non-redundant ties, are in a position to benefit from brokering ties between otherwise disconnected others (Burt, 1992). The similarity between TIO and brokerage research is the focus on the structural network position an actor occupies between two other actors, who could benefit from being connected by the broker. The difference is that research on brokerage and structural holes in the tradition of Burt infers or assumes that actors occupying this strategic position will exploit this position for their own benefit. TIO research, however, shows that actors in a brokerage position do not necessarily exploit this position for their own direct benefit but also tend to bridge structural holes and act as an apparently selfless facilitator between these actors that could benefit from collaboration (Fleming, Mingo, & Chen, 2007; Obstfeld, 2005; Xiao & Tsui, 2007).

TIO was originally developed to study innovation processes within firms. Obstfeld shows that individuals that score high on TIO play an important role in the innovation process within

firms (Obstfeld, 2005). Individuals that score high on TIO have a tendency to connect people when they think these other individuals can mutually benefit from each other or when they share a common interest. Instead of studying TIO by employees inside the firm as Obstfeld did, in this study I focus on the effects of TIO among independent entrepreneurs. In addition, in contrast to studying the relationship between TIO and innovation, I study the relationship between TIO and contracting behavior. Entrepreneurs that score high on TIO actively link other entrepreneurs who could be able to exploit business opportunities that result from combining complementary resources. However, as opposed to TIO in the context of employee involvement in the innovation process where the firm is ultimately able to benefit from this behavior by exploiting the innovation that results from it; TIO by entrepreneurs in an inter-organisational setting does not directly or necessarily lead to benefits to those individuals or firms engaging in it.

Although TIO may be valuable to those other entrepreneurs that are being connected through this third person, this does raise the question of whether entrepreneurs who engage in TIO also benefit themselves in terms of getting access to valuable resources and opportunities. Social exchange theory argues that if one person voluntarily provides a benefit to another in terms of information, advice or resources, this creates an obligation to the receiver to reciprocate (Blau, 1964). In addition, Adler and Kwon (2002) define social capital as “the goodwill available to individuals or groups. Its source lies in the structure and content of the actor's social relationships. Its effects flow from the information, influence, and solidarity it makes available to the actor.” (p. 23). Because of the tendency towards reciprocity and the goodwill created through TIO, one might expect that individuals that actively forge connections between others might be compensated through reciprocity of bridging behavior (Obstfeld, 2005). In other words, the two potential alliance partners who benefit from the selfless brokering of entrepreneurs, will return

the favour by, in turn, connecting them to potential alliance partners within their own network. I therefore hypothesize that:

Hypothesis 3: There is a positive relationship between a *Tertius Iungens* orientation and the number of firms from which entrepreneurs *receive* business contracts.

As stated above, organizations do not always have all the required resources they need to successfully compete in product markets and can actively scan factor markets in order to identify potential collaboration partners who possess complementary resources (Lumpkin & Dess, 1996; Chung et al., 2000). Therefore one might expect that individuals who score high on the TIO dimension bridge more structural holes (Burt, 1992), and as a result have a good knowledge of the activities of other entrepreneurs. This, in turn, allows them to be able to identify complementarities or potentially valuable joint business opportunities. Precisely because individuals scoring high on TIO have a good knowledge of the activities of other firms, one might expect that they are also better able to identify firms with whom they themselves have the possibility to exploit opportunities for collaboration because of complementary resources (Hitt et al., 2000; Sarkar et al., 2001). In addition, organizations tend to collaborate with others when there is a certain degree of trust based on pre-existing ties between these partners (Gulati, 1995), which are the result of previous interactions. I therefore hypothesize that:

Hypothesis 4: There is a positive relationship between a *Tertius Iungens* orientation and the number of firms to which entrepreneurs *give* business contracts.

## EMPIRICAL SETTING

The empirical setting of this study is entrepreneurs in business incubators. Research on the nature and benefits of business incubators has been on the rise since the 1980s (Hackett & Dilts, 2004) especially in relation to entrepreneurship (Bøllingtoft & Ulhøi, 2005; Marvel, 2011). Business incubators can be broadly defined as organizations that provide affordable office space and central services to – often recently set up – firms (Allen & McCluskey, 1990). These services can range from a shared reception and IT facilities to legal advice and access to venture capital (Hansen et al., 2000). Many studies on incubators focus on top-down strategies by the management of incubators. Roughly speaking one can identify two broad top down incubator strategies: the first is concerned with real estate development where incubators provide new ventures with cheap office space in renovated old buildings or underdeveloped neighbourhoods, while the second is concerned with actively fostering and supporting new ventures (Allen & McCluskey, 1990). These two broad strategies can be seen as a continuum (Brooks Jr., 1986).

Early studies on business incubators focus mainly on the effects of physical proximity, economies of scale, and cross fertilization between incubated firms (Hackett & Dilts, 2004), and provide evidence that firms use incubators as an internal market place for subcontracting or purchasing goods (Campbell, 1989). More recently attention has shifted towards so-called networked incubators (Bøllingtoft & Ulhøi, 2005; Hansen et al., 2000; McAdam & Marlow, 2007; Tötterman & Sten, 2005). Most of these studies have a top down approach in which they show what tools managers of business incubators have at their disposal to facilitate and actively foster network ties; not only among entrepreneurs that are co-located in incubators but also between entrepreneurs in incubators and external business partners (Hansen et al., 2000;

Tötterman & Sten, 2005). Although incubator managers could add value to entrepreneurs located in incubators by actively facilitating network formation, in practice, this is often not the case. Ties between incubated firms and incubator management are found to be infrequent, incubator managers hardly introduce incubated firms to influential individuals (Honig & Karlsson, 2007), and when they do forge links with external parties it ultimately does not lead to tangible results (Rice, 2002).

Possibly in reaction to these top down approaches, there have been calls in the literature to focus on studying incubators at the level of the individual entrepreneur (Phan et al., 2005). One specific study looks at networking between entrepreneurs within incubators from the bottom-up and found that co-location in incubators can indeed lead to cross fertilization. More specifically, they found that firms in incubators are not primarily interested in learning new skills but in buying other firms' competencies through business contracting (Bøllingtoft & Ulhøi, 2005). In addition, firms that are located in incubators that are jointly established by entrepreneurs themselves, and therefore lack a strong central incubator management, are also found to actively combine their resources and competences to jointly bid for contracts and use each other as internal suppliers (Bøllingtoft, 2012). Others, however, find that ties among tenants are weak and mainly characterized by information exchange instead of contractual relationships, possibly because of the large degree of diversity among the activities of tenants (Tötterman & Sten, 2005). In addition, it should be noted that entrepreneurs are, at times, also suspicious and cautious in their networking behavior within incubators in order to protect their business ideas and valuable relationships with investors (McAdam & Marlow, 2007).

Previous studies predominantly use social capital theory to explain bottom up contracting behavior among entrepreneurs within business incubators (Bøllingtoft & Ulhøi, 2005;

Bøllingtoft, 2012). They do not, however, study the effect of active networking behavior by individual entrepreneurs to explain contracting relationships within the incubator. Therefore, instead of looking at top down networking behavior by incubator management (Hansen et al., 2000), in this paper I focus on horizontal networking behavior among entrepreneurs located in business incubators. More specifically, I study the effects of networking behavior in terms of individual networking orientation and TIO and its effects on contracting relationships among entrepreneurs co-located in business incubators. The advantage of studying networking and exchange behavior between entrepreneurs precisely in business incubators is that there are clear boundary conditions; namely the building, its tenants and the exchange ties among them. Moreover, Venkataraman suggested studying entrepreneurship as a nexus of individuals and opportunities (Venkataraman, 1997). A business incubator is an especially useful setting since it is a prime example of a man-made nexus of individuals and opportunities, which, to some extent, exists because of the assumption of positive spillover effects among incubated firms.

## **DATA AND METHODS**

I focus on a specific type of business incubator that is specialized in renting office space to firms and individuals in the creative industries. Creative industries, for example, include architecture, film, fashion, design, music, games and performing arts (Florida, 2002; Scott, 2004). I used a survey research method to study networking and contracting behavior among entrepreneurs in four different creative industries incubators. These incubators were of varying size in terms of the number of tenants that they provide with office space. At the time of study the Arts & Crafts lab had 84 tenants, the Beehive 52, the Kauwgomballenfabriek 63, and the

Volkskrantgebouw 250. All of these incubators are based in the city of Amsterdam, the Netherlands.

The management of these incubators announced the research project to all the entrepreneurs who rented office space in their incubator. Approximately a week later they were sent an invitation to fill in an online questionnaire in Dutch (see annex 1 for Dutch and English versions of the key scales, items and instruments). In June 2010 449 invitations were sent by e-mail to all entrepreneurs in the four incubators in which they were asked to fill in the online questionnaire. This invitation was forwarded to all the entrepreneurs by the incubator management or directly by me based on a list with all the e-mail addresses of the entrepreneurs provided by the incubator management. Reminders were sent 1 week and 2 weeks later. Three weeks later the remaining entrepreneurs were either telephoned or visited on site (Dillman, 2000).

I received a total of 125 surveys. This amounts to a response rate of 27.8%. I deleted 19 questionnaires that were incomplete. In addition, since my research question is concerned with networking and contracting behavior among actual firms in the incubator, I deleted questionnaires that were filled out by either the incubator manager and the restaurant manager. I deleted the incubator management because it is not an incubated firm. I deleted the owner or manager of the bar/restaurant catering to individuals within incubators because this type of exchange relationships amount to selling food and drinks to individuals for consumption instead of forming collaborative ties on factor markets. After performing sensitivity analyses I also excluded three outliers and influential cases with a disproportionate effect on the outcome. The final sample consists of 101 completed questionnaires (n =101).

## Dependent variables

I use two dependent variables to study the internal contracting relationships of firms within incubators. First, the variable *inward contracting partners* is the number of firms within the incubator from which a focal firm received paid business assignments in the previous 12 months. In the questionnaire this was phrased as follows: “For which (maximum 5) persons in “[name incubator]” did you (or did your firm) perform paid assignments? Note: This excludes unpaid assignments: Note: Over the period covering the previous 12 months.” Individuals could name up to a maximum of five individuals and were instructed to start with the largest contracting partner in terms of the total value of the contracts measured in the absolute number of Euros (see Figure 1).

Second, the variable *outward contracting partners* is the number of firms within the incubator to which the focal firm has given paid business assignments in the previous 12 months. This was phrased as follows: “To which (maximum 5) persons in “[name incubator]” did you (or did your firm) grant paid assignments? Note: This excludes unpaid assignments: Note: Over the period covering the previous 12 months.” Again, individuals could name up to a maximum of five firms and were instructed to start with the largest contracting partner in terms of the total value of contracts measured in absolute number of Euros (see Figure 2).

“Insert Figure 1 here”

“Insert Figure 2 here”

I limited the number of names of persons that respondents could provide to a maximum of five in order to increase the response rate of the survey. I set this limit after exploratory interviews with entrepreneurs in incubators, who informed me that it is very unlikely to have more than five contracting partners in the incubator. This is also confirmed by the data. With respect to inward contracting relationships all entrepreneurs give less than 5 contracting partners. With respect to outward contracting relationships only 2 entrepreneurs indicate that they have 5 partners. In these two cases it might – but does not necessarily need to – be that they have more than 5 contracting partners.

### **Independent variables**

First, the variable *individual networking orientation* is a 7-point scale adaption of a five item scale which has been used in previous studies in the Netherlands (Hoogendoorn, Oosterbeek, & Van Praag, 2011). The fact that this scale has been tested in previous studies in the Netherlands avoids possible problems resulting from translating an English scale into Dutch. The Cronbach's Alpha score based on the five item scale is 0.675. The item "I make time to keep in touch with my friends" item correlated poorly with the overall scale (0.28) and was therefore dropped from the scale. In addition, the item "I run into friends in unfamiliar places" also correlated poorly (0.29). After having dropped these two items the Cronbach's Alpha of this scale increased to 0.714. The three items used in the scale are: "I network actively", "I participate in networking events", and "I try to meet new people".

Second, the variable *Tertius Iungens orientation* (TIO) is an adapted version of the 7-point scale with the same name developed by Obstfeld (2005). This variable was translated into

Dutch by the author. The original scale has six items. The item “I introduce people to each other who might have a common strategic work interest” was dropped since it does not fit the context of this study. The Cronbach’s Alpha based on the five item scale is 0.788. The item “I point out the common ground shared by people who have different perspectives on an issue” correlated poorly with the scale (0.21) and was therefore dropped. This increased the Cronbach’s Alpha of this four item scale to 0.869. The four items used in the scale are: “I will try to describe an issue in a way that will appeal to a diverse set of interests”; “I see opportunities for collaboration between people”; “I introduce two people when I think they might benefit from becoming acquainted” and “I forge connections between different people dealing with a particular issue.”

### **Control variables**

I included a number of control variables that could also explain the number of contracting relationships between entrepreneurs in business incubators. First, variations in the initial number of ties are expected to have an effect on the subsequent development of an individual’s network (Greve & Salaff, 2003). Although previous studies do not include relationships between firms that were already in place at the time of entry into the incubator (Hughes, Ireland, & Morgan, 2007), it can safely be assumed that prior relationships may have an effect on contracting behavior. The variable *acquaintances* is the number of other entrepreneurs the focal entrepreneur already knew at the time he or she entered the incubator. One might expect that the more acquaintances one has before entering the incubator, the larger the social network at the outset, and as a result the larger the number of contracting relationships. Second, the variable *months* measures the effect of the number of months a firm has been in the incubator. The longer an

entrepreneur is based in an incubator, the larger its network and therefore its contracting relationships are likely to be. The variables acquaintance and months also control for a liability of newness effect (Stinchcombe, 1965).

Third, I included a context specific dummy named *art*. The incubators that I studied where all predominantly renting office space to entrepreneurs in the creative industries. In the Netherlands the creative industries are generally classified in three categories: arts, media and entertainment, and creative business services (Rutten, Manshanden, Muskens, & Koops, 2004). I included a dummy *art* for the first category since artists may have difficulty letting others do part of their work because they risk a loss of authenticity. Fourth, the dummy *subsidy* identifies artists that receive a government subsidy to help them pay part of their rent through the so-called Commissie Ateliers en (Woon)Werkpanden Amsterdam (CAWA) policy. This subsidy is meant for artists that can prove that they are professionally active as an artist, do not earn more than € 35.850 indexed on 1-1-2007, and are tied to the region of the city of Amsterdam (Gemeente Amsterdam, 2007).

Fifth, I included the variable *firm size* operationalized as the number of full time employees (FTEs). I expect large firms to give more contracts to other (possibly small) firms because large firms produce more goods and services. The more goods and services a firm produces the more possibilities they have for contracting out part of it to other firms. Finally, the variable *firm age* is operationalized as the age of the firm in number of years since it was founded. I expect older or more established firms to be less active in and dependent on network ties with other firms in the incubator (Greve & Salaff, 2003).

## **Method**

Since the dependent variables inward contracting partners (see Figure 1) and outward contracting partners (see Figure 2) that measure the number of partners are based on count data, I specified a Poisson model. Poisson models are appropriate when the variance is not much larger than the mean. When the variance is much larger than the mean this could indicate overdispersion. The likelihood ratio test for the over-dispersion parameter alpha (Cameron & Trivedi, 1990) was insignificant for the inward contracting partners model with a mean of 0.42 and a variance of 0.69, and significant for the outward contracting partners model with a mean of 0.60 and a variance of 1.26. This is an indication that a Poisson model is appropriate for the inward contracting partners model while a negative binomial might be more suitable for the outward contracting partners model. However, because the sample size is rather small specifying a negative binomial is not regarded to be the best choice (Long, 1997). I therefore specified Poisson models for both inward and outward contracting partners.

“Insert Table 1 here”

“Insert Table 2 here”

## **RESULTS**

Table 1 shows the descriptive statistics and correlations and table 2 shows the results of the Poisson regression analysis.

With respect to the control variables in model 1a or the inward contracting partners model (pseudo  $R^2 = .21$ ), I found a positive and significant relationship between the variable number of months ( $\beta = .06, p < .001$ ) that a firm has been in the incubator, and the number of firms in the incubator from which it received paid business assignments over the previous year. However, entrepreneurs that can be classified as belonging to the art category have significantly less ties to other firms within the incubator that provide them with paid business contracts ( $\beta = -1.03, p < .05$ ). In addition, I find a marginally significant and negative relationship between firm size ( $\beta = -.28, p < .10$ ) and inward contracting partners.

In model 2a or the outward contracting partners model (pseudo  $R^2 = .18$ ) I found positive and significant effects with respect to the number of acquaintances ( $\beta = .15, p < .001$ ) an entrepreneur has at the time of entry into the incubator; the number of months ( $\beta = .04, p < .01$ ) an entrepreneur has been based in the incubator; whether or not an entrepreneur receives a rent subsidy ( $\beta = 1.13, p < .001$ ) from the government; and firm size ( $\beta = .10, p < .001$ ) on the number of partners within the incubator to which a firm has given paid business contracts. In addition, I found a negative relationship between firm age ( $\beta = -.08, p < .001$ ) and outward contracting partners.

In the next step I included the main variables linked to the four hypotheses. Model 1b provides no support for hypothesis 1: that there is a positive relationship between networking orientation, and the number of firms from which an entrepreneur receives paid business contracts. Although the sign of the coefficient for networking orientation is positive, it is not statistically significant ( $p = .42$ ). Model 2b on the other hand, shows that networking orientation does have a significant and positive effect ( $\beta = .37, p < 0.05$ ) on the number of outward contracting partners a focal firm has with others firms that are located in the same incubator.

This is in support of hypothesis 2. This coefficient can be interpreted as a semi-elasticity. Scoring one point higher on the 1-7 network orientation scale is associated with a 37% increase in the number of outward contracting partners. Or alternatively, as an average marginal effect: scoring one point higher is associated with  $.37 \times .60 = 0.22$  additional outward contracting partners.

With respect to inward contracting partners, model 1b does not support hypothesis 3. This means that I find no statistically significant relationship between TIO and the number of contracting partners an entrepreneur receives business contracts from. Interestingly enough, although it is insignificant, it is worth noting that the sign is actually negative and in the opposite direction. Model 2b, however, does provide support for hypothesis 4. There is indeed a positive and marginally significant relationship between TIO ( $\beta = .41, p < 0.1$ ) and the number of outward contracting partners. This coefficient can be interpreted as a semi-elasticity: scoring one point higher on the 1-7 TIO scale is associated with a 41% increase in the number of outward contracting partners. Or alternatively as an average marginal effect: scoring one point higher is associated with  $.41 \times .60 = 0.25$  additional outward contracting partners. Model 2b, which includes the main effects networking orientation and Tertius Iungens orientation, explains significantly more variance than the control model ( $\Delta \text{pseudo } R^2 = .07, p < 0.01$ ).

### **Robustness checks**

I conducted a number of robustness checks. First of all, I performed a variance inflation factor test to see whether multicollinearity could pose a problem. The mean VIF is 1.30 (highest 1.62) and therefore does not indicate a multicollinearity problem. I also ran a number of

alternative models that included other variables that may possibly affect the results, but these variables turned out to be insignificant.

Second, I included a dummy that identified whether the person that completed the questionnaire is either the owner or founder of the focal firm to make sure the questionnaire is completed by the person that is assumed to be involved in, and aware of, the decisions taken at the firm level. This was the case for 88% of the questionnaires. This dummy was not significant in any model and therefore dropped from the analysis.

Third, I included three dummies to identify the four different incubators in which data was collected. The management of these incubators agreed to participate in this study under the condition that in the analysis I would not disclose any outcomes on the level of the individual incubators. I did, however, run the analysis with three dummies to test whether the results differed for any of these four incubators. None of these dummies were significant in either model. This is also an indication that the findings may be generalizable to other incubators in the creative industries.

Fourth, I tested two additional models that included interaction effects between the control variable months and networking orientation, and months and TIO. I did this in order to check whether the relationship between networking behavior and contracting relationships is moderated by how long an entrepreneur has been based within a particular incubator. None of these interactions was significant.

Fifth, I fitted a model in which I estimated the effect of networking orientation, TIO, inward contracting partners, and outward contracting partners on individual firm performance. I used two different performance variables as dependent variables: absolute annual turnover and relative turnover operationalized as annual turnover divided by the number of full time

employees. Because of their non-normal distributions, I performed a log transformation of the variable absolute annual turnover, and a square root transformation of the variable relative turnover. Due to missing data this regression was performed on 87 cases and therefore should be interpreted with care. None of these four independent variables was significant in either of the two models. This is an indication that networking orientation, a TIO, inward contracting partners, and outward contracting partners, does not influence external firm performance.

Finally, since the networking orientation and the TIO scales have a correlation of 0.59, I performed a confirmatory factor analysis (CFA) to test whether a two factor model is better than a one factor model. I performed this CFA using the AMOS 19.0 software. In evaluating the fit of each of the tested models, I used the following indices: (1) chi-square goodness of fit to degrees of freedom ratio (CMIN/DF); (2) the comparative fit index (CFI); and (3) the root-mean-square error of approximation (RMSEA) (Steiger, 1990). Previous scholars suggest that a satisfactory model fit is indicated by a chi-square goodness of fit to degrees of freedom ratio lower than 2; RMSEA values lower than .08; and CFI values larger than .90 (Bentler, 1990; Brown, Cober, Kane, Levy, & Shalhoop, 2006) or 0.95 (Hu & Bentler, 1999). The results showed that the two factor model (CMIN/DF = 1.363,  $p = 0.168$ ; CFI = 0.986; RMSEA = 0.06) is a better fit than the one factor model (CMIN/DF = 2.433,  $p = 0.002$ ; CFI = 0.939; RMSEA = 0.12).

## **DISCUSSION**

In this paper I studied the relationship between networking behavior of entrepreneurs and the number of contractual ties – in terms of receiving and giving business assignments – they have with other entrepreneurs. I made a distinction between two types of networking behavior:

individual networking orientation and Tertius Iungens orientation (TIO). Individuals that score high on networking orientation tend to actively build informal social ties from which they hope, and expect, to professionally benefit in the future. Individuals that score high on TIO tend to actively facilitate collaboration between connected or previously disconnected others, when they believe these individuals might benefit from one another (Obstfeld, 2005). I studied these phenomena in the empirical setting of business incubators. I found that individuals that score high on networking behaviour, both in terms of networking orientation and TIO, have more outward contracting relationships with other entrepreneurs in terms of providing them with business assignments. On the other hand, I find no relationship between networking orientation or TIO and the number of business assignments that entrepreneurs receive from other entrepreneurs within the incubator.

A surprising finding of this study is that, contrary to expectations, I found no significant relationship between networking behavior, either in terms of individual networking orientation or TIO, and the number of business contracts a focal entrepreneur receives from other entrepreneurs. Since past studies show that networks are important in providing actors with access to crucial resources and opportunities (Brass et al., 2004; Granovetter, 1973), one would expect that networking behavior and the resultant weak ties with other entrepreneurs, will eventually lead to stronger ties in terms of formal business relationships from which entrepreneurs receive valuable business contracts. A possible explanation could be that entrepreneurs that score high on networking behavior are proactive individuals who themselves take the initiative to set up collaborations when they identify opportunities, instead of waiting for potential partners to take the lead (Sarkar et al., 2001).

This study has a number of theoretical contributions. First, I show that individual networking behavior is positively related with tie formation between entrepreneurs. In their review on network studies in entrepreneurship, Hoang and Antoncic (2003) and Slotte-Kock and Coviello (2010) found that previous studies on social networks and entrepreneurship often focus on network ties or position as independent variables (see for example Davidsson & Honig, 2003; De Carolis & Saporito, 2006). In contrast, I focus on tie formation as the dependent variable. This is an important contribution because although many studies focus on the consequences of occupying a central network position, only a small number study antecedents in terms of individual characteristics that may lead to this network position (Klein et al., 2004). The finding that networking behavior is positively related with establishing contractual relationships with other entrepreneurs, could be an indication that networking behaviour, which lead to weak ties, could, in turn, evolve into stronger ties between entrepreneurs in terms of actual contractual relationships. This has important implications for social network theory both within and beyond the field of entrepreneurship, since it provides evidence of how the influence of individual agency affects network structure.

Second, by studying TIO in an inter-firm, as opposed to intra-firm, setting I show the value of the TIO construct outside the boundaries of the firm. In addition, instead of innovation involvement as the outcome variable, I focus on involvement in contractual relationships among firms. Whereas Obstfeld (2005) originally studied TIO in an intra-firm setting, where employees may be expected to have a stronger tendency to collaborate, in this paper I applied the TIO construct in an inter-firm setting by studying the relationship between TIO and contractual ties between independent firms in which competitive forces are more salient. Although in the former, the firm will ultimately benefit from TIO by its employees because it can ultimately capture the

rents of innovation, in the latter there is no guarantee that entrepreneurs will benefit from this apparently selfless networking behavior. In this study, however, I show that entrepreneurs that score high on TIO do seem to benefit from this behavior in terms of having more partners to whom they can contract (parts of) their business activities.

Third, this study also contributes to theory on alliances entrepreneurship. Previous research highlights the positive effect of alliance proactiveness, defined as the degree in which organizations identify and respond to partnering opportunities, on a firm's market performance (Sarkar et al., 2001). I build on this previous study by showing that entrepreneurs that spend more time on networking activities are more likely to identify potential alliance partners. In addition, I extend these earlier findings by showing that entrepreneurs that actively facilitate alliance formation between other firms, are also more likely to forge alliances themselves. It could be that entrepreneurs that spot alliance opportunities between other entrepreneurs, and actively share this information with one or both potential alliance partners, are benefitting from bridging reciprocity, in a similar fashion as employees in intra-firm settings as suggested by Obstfeld (2005). In other words, prospective or new alliance partners that benefitted from selfless brokering behavior by entrepreneurs, could be returning the favour by connecting them to potentially valuable alliance partners in their own network.

The fourth contribution is to current incubator research. A number of recent studies show how managers of business incubators can, and should, facilitate and actively foster networks of entrepreneurs located in business incubators (Hansen et al., 2000; Tötterman & Sten, 2005). However, ties between incubated entrepreneurs and incubator management are found to be infrequent (Honig & Karlsson, 2007), and TIO behavior by incubator management, in which they try to link their incubated entrepreneurs with potential business partners or resource

providers outside the incubator, often do not lead to successful collaboration (Rice, 2002). Other studies show that in the absence of active top down networking facilitation by incubator managers, co-location in incubators still leads to collaboration among entrepreneurs that use the incubator as an internal market place (Bøllingtoft, 2012). In addition to confirming the existence of an internal market, I found that networking behavior is an important antecedent for the emergence of this internal market within business incubators. More specifically, I show that although networking behavior by entrepreneurs does not culminate into receiving business assignments from other entrepreneurs, it does lead them to contract (parts of) business assignments to other entrepreneurs. This network might give them flexible access to (complementary) resources of co-located entrepreneurs, which allows them to take on larger projects that they would not have been able to handle on their own. Furthermore, collaboration with business partners that are co-located in the same incubator, could lower the risk of them behaving opportunistically because of potential reputational damage.

In addition, there are a number of practical implications of the findings. First, since incubators are often dependent on start-up or operating subsidies by (local) governments, better insights into the performance of entrepreneurs that are located in incubators will help incubator managers to legitimize their efforts (Erlewine, 2007). The finding of this study that there indeed is collaboration between entrepreneurs, in terms of actual contractual relationships, provides additional evidence that there are positive spill-over effects from being co-located. Second, since success at the level of the incubator depends on a minimum degree of altruism and collectivism (Bøllingtoft & Ulhøi, 2005), centrally managed or self-organized incubators (Bøllingtoft, 2012) might want to select tenants based on the degree to which they tend to engage in TIO that could result in cross fertilization. Third, my findings show that entrepreneurs that actively engage in

networking behavior should expect to benefit not in the sense of passively receiving business contracts from other incubated entrepreneurs, but from actively identifying potential partners with whom they could form alliances or subcontract parts of larger projects that allow them to take on larger projects. This is a relatively low risk growth strategy since, in addition to the low risk of opportunistic behavior by fellow incubated entrepreneurs, it does not require entrepreneurs to directly hire new employees.

Finally, this study has a number of limitations that provide opportunities for future research. First, this study focused on entrepreneurs in incubators. Studying contracting relationships among – especially new – entrepreneurs outside incubators could improve the generalizability of the findings. Second, future studies could include structural network characteristics, such as centrality, as independent variables. The response rate of the current study was too small to derive meaningful structural network variables from the data. Third, future studies could focus on the effect of physical proximity (Reagans, 2011), and similarity (McPherson, Smith-Lovin, & Cook, 2001), between entrepreneurs in terms of their business activities, size and experience on the formation of collaborative ties. Fourth, in the setting of incubators, it might be interesting to study how TIO at the level of individual entrepreneurs is related to performance at the aggregate level of the incubator, since incubators are set up partly under the assumption of positive spill-over effects among incubated entrepreneurs. Finally, one could study the optimal level of similarity or diversity among incubated entrepreneurs since this might explain the variance in the degree of contractual relationships that is found among incubatees (Tötterman & Sten, 2005).

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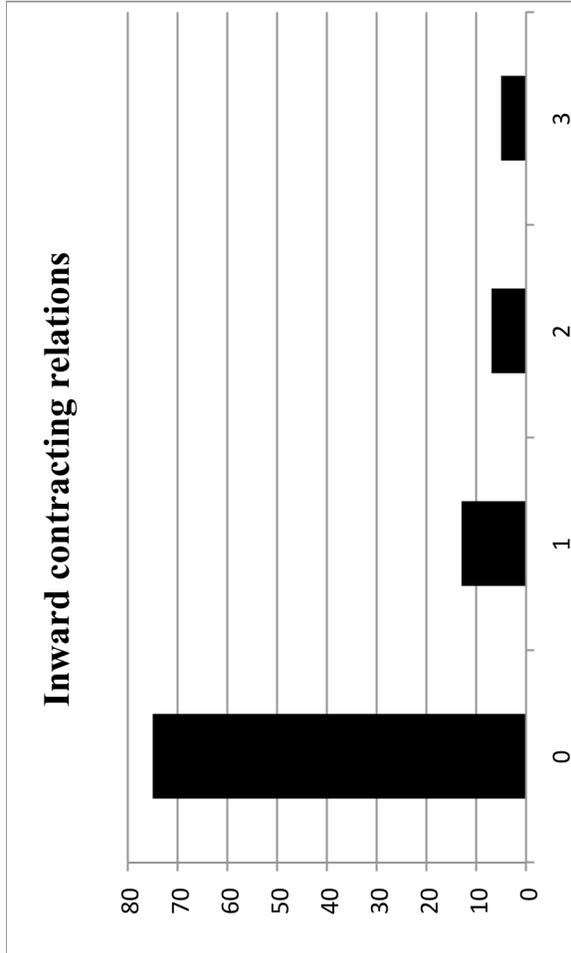
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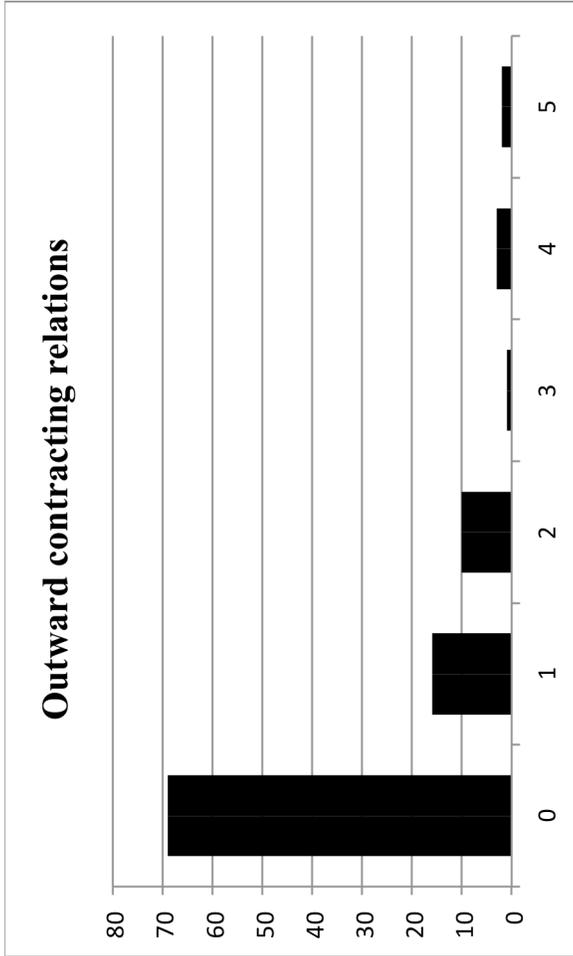
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**Figure 1**



**Figure 2**



**Table 1**

**TABLE 1**  
Means, Standard Deviations, and Correlations<sup>a</sup>

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9
1. Inward contracting partners	.42	.83									
2. Outward contracting partners	.60	1.12	.07								
3. Firm age	7.09	8.67	-.04	-.05							
4. Firm size	3.40	7.25	-.15	.20 *	.44 **						
5. Subsidy	.18	.38	.11	.14	.09	-.13					
6. Acquaintances	2.61	3.48	.10	.12	-.02	-.15	-.07				
7. Months	24.82	12.15	.34 **	.16	.10	-.09	.06	-.06			
8. Art	.29	.45	-.16	-.15	.10	-.15	-.01	.23 *	-.06		
9. Tertius lungens orientation	5.44	.88	-.10	.24 *	.11	.08	-.04	.17	-.18	-.02	
10. Networking orientation	4.71	1.09	-.03	.29 **	.06	.14	-.08	.30 **	-.14	-.11	.59 **

<sup>a</sup> n = 101

\* p < 0.05

\*\* p < 0.01

**Table 2**

**TABLE 2**  
**Results of Poisson Regression Analysis on Contracting Relationships**

<b>Variables</b>	<b>Model 1a</b> Inward contracting partners	<b>Model 1b</b> Inward contracting partners	<b>Model 2a</b> Outward contracting partners	<b>Model 2b</b> Outward contracting partners
<b>Controls</b>				
Acquaintances	.08	.07	.15	.08 *
Months	.06 ***	.06 ***	.04 **	.05 ***
Art	-1.03 *	-1.01 *	-.80 *	-.53
Subsidy	.25	.31	1.13 ***	.88 **
Firm size	-.28 +	-.29 +	.10 ***	.08 ***
Firm age	-.01	-.01	-.08 ***	-.07 **
<b>Main effects</b>				
Networking orientation		.16		.37 *
Tertius lungens orientation		-.23		.41 +
LR chi2	39.21	40.31	44.10	59.25
Pseudo R <sup>2</sup>	.21	.22	.18	.25
Δ Pseudo R <sup>2</sup>		.01		.07 **
N	101	101	101	101

Two-tailed test: + p < .10, \* p < .05, \*\* p < .01, \*\*\* p < .001

## Annex 1: Core scales and items of the questionnaire in Dutch and English

<b>Inward contracting partners</b>	Voor welke (maximaal 5) personen in “[naam] incubator” heeft u (of heeft uw onderneming) betaalde opdrachten uitgevoerd? Let op: Het gaat hier niet om gratis werk. Let op: Gedurende de afgelopen 12 maanden.	For which (maximum 5) persons in “[name incubator]” did you (or did your firm) perform paid assignments? Note: This excludes unpaid assignments: Note: Over the period covering the previous 12 months.
<b>Outward contracting partners</b>	Aan welke (maximaal 5) personen in “[naam incubator]” heeft u (of heeft uw onderneming) betaalde opdrachten verleend? Let op: Het gaat hier niet om gratis werk. Let op: Gedurende de afgelopen 12 maanden.	To which (maximum 5) persons in “[name incubator]” did you (or did your firm) grant paid assignments? Note: This excludes unpaid assignments: Note: Over the period covering the previous 12 months.
<b>Networking orientation</b>	Ik ben een actieve netwerker Ik doe mee aan netwerkevenementen Ik maak tijd vrij om contact te onderhouden met mijn vrienden (dropped from scale) Ik kom toevallig vrienden tegen op vreemde plekken (dropped from scale) Ik probeer nieuwe mensen te ontmoeten	I network actively I participate in networking events I make time to keep in touch with my friends (dropped from scale) I run into friends in unfamiliar places (dropped from scale) I try to meet new people
<b>Tertius iungens orientation</b>	Ik stel mensen aan elkaar voor die mogelijk dezelfde belangen delen. Ik zie vaak mogelijkheden tot samenwerking tussen andere mensen. Als mensen een verschillende mening over iets lijken te hebben, wijs is hen graag op de punten waar zij het eigenlijk over eens zijn (dropped from scale) Ik stel mensen aan elkaar voor wanneer ik denk dat ze iets aan elkaar zouden kunnen hebben. Ik zorg er voor dat mensen die zich met eenzelfde kwestie bezighouden met elkaar in contact komen	I introduce people to each other who might have a common strategic work interest I see opportunities for collaboration between people I point out the common ground shared by people who have different perspectives on an issue (dropped from scale) I introduce two people when I think they might benefit from becoming acquainted I forge connections between different people dealing with a particular issue.