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The relevance of social capital in the form of network brokerage, network cohesion and network homophily to intrapreneurship

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Abstract: Research acknowledges that innovation within an organisation is as much of a social phenomenon as a technical one, signifying the importance of social capital to develop intrapreneurship. Given there are several unresolved issues concerning the various forms of social capital on intrapreneuring, the study seeks to establish to what extent does social capital in the form of network brokerage, social network cohesion and network homophily influence intrapreneurship. A survey is administered internationally to middle managers as they have an integrative role enabling them to shape intrapreneurial behaviour in an organisation. Findings show positive and significant results for all the study hypotheses, where network building, network influence, bridging, trust, reciprocity, and relationship linking all demonstrate large predictive relevancy values in terms of the study model. The relevance of the significant findings is apparent when considering that activities associated with fostering network brokerage and social cohesion can explain intrapreneurship.

Keywords: intrapreneurship; corporate entrepreneurship; innovation; social capital; network brokerage; social network cohesion; network homophily.

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Biographical notes: Boris Urban is a highly cited researcher where to date, he has published over a 150 journal articles, case studies, and book chapters. He is an editor of five books published by Oxford University Press, Pearson, and Springer. Most of his articles appear in a wide range of peer-reviewed journals.

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His primary research agenda is to deepen understanding of entrepreneurial behaviour within a unified explanatory structure at the individual, organisational and societal levels.

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1 Introduction

Although there are different manifestations of entrepreneurial activity, in larger organisations a considerable amount of research shows that corporate entrepreneurship is an essential component of organisational management and strategy (Bosma et al., 2020; Ireland et al., 2009; Urban, 2021). Corporate entrepreneurship as a strategy can promote entrepreneurial activity insofar an entrepreneurial organisation seeks novel solutions through innovation, self-renewal, and new venture creation (Bierwerth et al., 2015; Ghalamkari et al., 2021; Kuratko et al., 2014; Schröder et al., 2021; Urbano et al., 2013). Corporate entrepreneurship has its roots in intrapreneuring, a term conceptualised by Pinchot (1987), used to designate any "strategic attempt by an existing firm to inculcate the mind-set and behaviours common to external entrepreneurs within its employees" (Antoncic and Hisrich, 2003; Urban and Verachia, 2019). Emerging research shows that entrepreneurs because of their high network centrality engage in a firm's inventive activities, which enhances firm innovation performance and growth prospects (Mueller et al., 2020; Urban and Maphumulo, 2022).

Recent developments such as the COVID-19 pandemic are threatening the survival of many organisations which highlights the importance of intrapreneuring insofar higher degrees of responsiveness, flexibility and innovation are required when dealing with a crisis such as the pandemic (Urban, 2021). However, intrapreneuring is not easily attainable, as corporate entrepreneurship requires the alignment of employee values, behaviours, and actions throughout the organisation (Bosma et al., 2020; Donate et al., 2016; Ireland et al., 2009; Schröder et al., 2021). Indeed, scholars recognise that innovation within an organisation is as much of a social phenomenon as a technical one, emphasising a reliance on social capital to build momentum and buy-in to intrapreneurial activity (Arena and Uhl-Bien, 2016; Prexl and Gonera, 2021; Soda et al., 2018; Urban, 2021; Urban and Matela, 2022).

Central to these elaborations on intrapreneuring is the issue of social capital. Research is pervasive that entrepreneurial activity is "embedded in social relationships which consist of personal contacts, business contacts and other entrepreneurial networks that form social capital" (Adler and Kwon, 2014; Gedajlovic et al., 2013; Granovetter, 1985;

Light and Dana, 2013). In any organisation the way in which roles are performed, how communication and participation are organised, and how disagreements are settled, all influence how employees perceive matters such as autonomy, trust, cohesiveness, support, recognition, innovation, and fairness (Antoncic and Hisrich, 2003). Focusing on social capital is beneficial and a useful means of analysing entrepreneurship in organisations as it facilitates discussions on the manner of social exchanges at various levels of analysis and amongst a varied set of circumstances (Costa and Didonet, 2020; Dana et al., 2022; Gedajlovic et al., 2013; Harsh, 2021; Lee et al., 2017; Moran, 2005; Nahapiet and Ghoshal, 1998).

However, it has been noted in the management literature that the evaluation of the relevance of social capital towards corporate entrepreneurship is a question that requires additional empirical consideration (Urban, 2021; Walter et al., 2015; Zelekha and Dana, 2019). Most of the research on intrapreneurship to date has focussed on organisational factors with scant research concentrated on the individual level of intrapreneurial activity (Blanka, 2018). Scholars emphasise that social capital is not inevitably 'good or bad for intrapreneurial venturing' (Light and Dana, 2013), but rather it will be contingent on distinguishing between the different dimensions of social capital (Gedajlovic et al., 2013). These include the structural and interactional elements of networks in terms of network brokerage and social cohesion (Burt, 2005; Soda et al., 2018), as well as network homophily (De Carolis et al., 2009; McPherson et al., 2001).

Given that there are unresolved issues concerning various forms of social capital and intrapreneuring, this research gap presents an opportunity to advance appreciation of the relevance of different types of social capital applicable to intrapreneurship. Accordingly, the research objective is to determine the relationship between social capital and intrapreneurship by concentrating on different forms of social capital in terms of network brokerage, social network cohesion and network homophily.

In this regard three separate research questions are presented which drive the purpose of this study:

1 To what degree does network brokerage, defined as the bridge connections from one cluster or network to another which generally results in the broker benefitting from differential access to resources and advantages (Burt, 2005; Soda et al., 2018), influence intrapreneurship.

2 To what degree does social network cohesion, defined as the state of interactions within a network that are "characterised by a set of attitudes and norms including their behavioural manifestations" (Chan et al., 2006; Fleming et al., 2007) influence intrapreneurship.

3 To what degree does network homophily, defined as the interaction between similar individuals which transpires at a higher rate than with dissimilar individuals (De Carolis et al., 2009; McPherson et al., 2001) influence intrapreneurship.

This study makes several contributions to business management literature by empirically examining a set of social capital factors which have not previously been associated with intrapreneurship. While extensive research has been steered to uncover what intrinsic, organisational, and human capital requirements are necessary to extract value from intrapreneurs, minimal work has been conducted to uncover which social capital components are required for successful intrapreneuring (Arena and Uhl-Bien, 2016). In this sense the study provides a novel contribution to understanding how previously

unrelated components of social capital can provide advantages to an organisation in the form of intrapreneurship. Relying on specific dimensions of the social capital allows for a more fine-grained analysis to emerge regarding how intrapreneurship is affected by each of these constructs. Research highlights those individuals with rich social capital are generally better at creating value, breaking silos, and improving collaboration for an organisation (Chan et al., 2006; Fleming et al., 2007), all of which are necessary ingredients for intrapreneuring.

Another contribution of this study is the focus on middle managers who are uniquely positioned within an organisation and have an integrative role to play in fostering intrapreneurship (Kuratko et al., 2014). As such, middle managers can influence and shape intrapreneurial behaviour in an organisation because of their networks, brokerage across their networks and their ability to bundle and integrate resources from and across levels of the organisation (Blanka, 2018; Kuratko et al., 2014). Additionally, the study has important practical implications as increased social capital amongst intrapreneurs and their intrapreneurial networks allows for bonding and bridging with peers, provides access to non-redundant information, new ideas and social influence, all of which unlock intrapreneurial activity (Akhtar and Kang, 2016; Alexandrovskiy et al., 2022; Mohammad, 2022).

The rest of the article is ordered in the following manner: first a literature review is conducted upon which the hypotheses are formulated. The research methods follow with respect to sampling and instruments used in the survey. The statistical results are then presented and tabulated. Discussion of the findings follow, and study implications, limitations and future research suggestions are offered.

2 Literature overview

2.1 Intrapreneurship and social capital

Various terms are used to refer to unique aspects of entrepreneurship in literature such as ‘internal corporate entrepreneurship’, ‘corporate entrepreneurship’, ‘corporate venture’, ‘internal corporate venture’ and ‘intrapreneurship’. Pinchot (1987) conceptualised intrapreneurs as entrepreneurial thinking people within existing organisations who enable organisations to grow, as they can think across boundaries and organisational divisions. As a result of intrapreneurial activities, intrapreneurs formulate the foundational basis for innovation and create a competitive advantage for organisations (Antoncic and Hisrich, 2003; Gawke et al., 2019; Guerrero and Peña-Legazkue, 2013; Urban and Verachia, 2019).

Intrapreneurship has been recognised to be vital to the capability of an organisation to participate in strategic renewal and new venture creation (Ireland et al., 2009). Some researchers suggest that middle managers are, by default, intrapreneurs within an organisation, owing to their roles and tasks which include motivating employees, acquiring resources and gaining momentum around ideas by selling these ideas to top-level management (Kuratko et al., 2014).

Social capital has been largely characterised through norms of trust and reciprocity as these are the elements which facilitate cooperative action and the enablement of individuals to act for mutual benefit based on the quality of social relationships (Harsh, 2021; Nahapiet and Ghoshal, 1998). Based on the ability of social capital to mobilise

individuals in a common direction, it has often been classified as a resource that can harvest multiple benefits such as the sharing of knowledge and the increasing of information flow within an organisation, both of which have been positively linked to intrapreneurship (Burt, 2005; Guerrero and Peña-Legazkue, 2013).

Several scholars have put forward that social capital in a network provides an advantage, through the social structure rendering a situation of imperfect competition, by creating opportunities for certain individuals based on their connections (Costa and Didonet, 2020; Urbano et al., 2013). This is as a result of the fact that personal networks can be seen as a capability for an intrapreneur, as this has the ability to facilitate the flow of resources (De Carolis et al., 2009; Urbano et al., 2013). It has further been postulated that social capital has the ability to release additional resources when mobilising resources for an initial initiative or intrapreneurial endeavour, where structural and interactional elements of networks include network brokerage and social cohesion (Burt, 2005; Soda et al., 2018), and network homophily (De Carolis et al., 2009; McPherson et al., 2001).

Network brokerage, as Burt (2005) notes embodies the bridge connections from one group to another group and it occurs as individuals, or brokers, act as connectors or joins from one group to the next. The importance of brokering competencies which depend on a blend of knowledge combination, social capital and networking skills are well recognised in the literature (Soda et al., 2018). Studies go further to state that brokers benefit from the access and control to resources and information as well as the referral and receipt of advantages provided to them by access to otherwise disconnected nodes within an organisation (Soda et al., 2018).

Social network cohesion is a "state of affairs comprising both the horizontal and vertical relationships among members of a society, as characterised by a cluster of attitudes and norms that include trust, a sense of belonging, as well as the inclination to contribute, participate, support and assist, along with their behavioural manifestations" (Chan et al., 2006). As a consequence of these formal and informal ties, intrapreneurs with cohesive social networks are positioned to respond more nimbly to their operating environment as well as access resources for their ventures (Nahapiet and Ghoshal, 1998).

Network homophily is the "principle that contact between similar individuals occurs at a higher rate than with dissimilar individuals" and is supported by the notion that similarity breeds connection within social networks (McPherson et al., 2001). The result of network homophily is that networks formed are often homogenous with respect to multiple behavioural, sociodemographic, and intrapersonal characteristics. Each of these social networking principles is now further analysed in the context of hypotheses formulation,

2.2 Network brokerage

The networks that intrapreneurs build within organisations enables them to remain open minded, unpack and discover new opportunities as well as develop brokering competencies (Blanka, 2018). As a result of these advantages, related to brokerage specifically, the social embeddedness of intrapreneurs within organisations is important to assess when developing and identifying intrapreneurial behaviour to drive innovation (Fleming et al., 2007). This is also a function of the fact that brokerage within a network is as much a part of an individual's network position as it is related to an individual's

behaviour and strategic orientation towards mobilising resources within a network (Moran, 2005).

The benefits of stakeholder linking from the perspective of social capital originated from non-superfluous ties, or the absence of network ties in the form of structural holes (Moran, 2005). This is because disconnected networks can provide non-redundant and different sources of information and resources, making them more valuable (Burt, 1997; Granovetter, 1985). These weak network ties are characterised by structural features of the network in the form of connectivity, centrality and hierarchy between individuals and organisational divisions (Nahapiet and Ghoshal, 1998). In addition to this, the value of weak network ties that are later linked lies in the ability of these ties to provide an advantage to the individual who connects the disparate networks as this individual can enjoy the benefits associated with the dissemination and use of the resources (Moran, 2005).

Relational bonding is horizontal, and amongst equals or within a peer group and is inward looking which has been likened to the term or concept of 'collaborating broker' (Soda et al., 2018). In management science, relational bonding is described as originating from core ties, typically existing in environments with high closure, trust and shared norms and is often the primary source of interpersonal contact which forms a core network (Granovetter, 1985; McPherson et al., 2001). On the other hand resource bridging occurs between different groups, is outward looking and based on trust. The bridging forms of social capital describe how an individual's success, and this case, intrapreneurial success, is related to the connections, value and resources that social capital and brokerage competencies allow access to (Adler and Kwon, 2014). This type of brokerage has been referred to as 'arbitraging' owing to the ability of a broker to exploit informational asymmetries within a network as a result of being active in multiple networks or clusters and having unique access to a diverse range of information (Soda et al., 2018). Further to this, studies have identified middle managers within organisations as front and centre to information flowing through an organisation from various sources and that these middle managers are able to identify resource gaps and broker resources through the organisation (Kuratko et al., 2014; Morikuni et al., 2019). Based on the emerging theory in this regard the study aims to test the following hypothesis in terms of network brokerage through the reflective constructs of relational bonding, stakeholder linking and resource bridging:

H1 There is a positive relationship between network brokerage and intrapreneurship.

2.3 Social network cohesion

Social network cohesion involves both the horizontal and vertical relationships which include trust, as well as the inclination to contribute, participate, support and assist (Chan et al., 2006). Relational social capital, with particular emphasis on intrapreneurship, speaks to the ability of an intrapreneur to receive and extract "informational, physical and emotional support whilst in the venture creation process" by enabling the establishment of trust and communication between individuals within a network (Fleming et al., 2007). Literature further postulates that the knowledge and resources entrenched in these social networks are crucial to the formulation, support and fostering of intrapreneurship (De Carolis et al., 2009).

Nahapiet and Ghoshal (1998) speak of relational trust which arises because of being embedded in a social network and echoes the sentiment around trust being a belief that individuals care about each other's welfare and will act in accordance. Trust could represent a governance mechanism in organisations that is rooted in relationships. This often results from repeated actions which produce feelings of reliability between individuals (Mehra et al., 2001).

Risk-taking propensity has been characterised as the quick pursuit of opportunities or resources and bold actions when evaluated through the lens of the pursuit of intrapreneurial activities (Kuratko et al., 2014; Urban, 2021). This attitude and approach to risk-taking propensity is often likened with intrapreneurial behaviour which can be described as bold, directive and opportunity seeking (Urbano et al., 2013). Intrapreneurs may vary their risk-taking propensities depending on their growth aspirations, experience and supporting relationships in the form of their networks (Ireland et al., 2009).

Prior research shows that risk-taking pressure is alleviated as a result of the dense third-party ties around a social relationship serving to overcome the challenges as cohesion highlights and brings to light the value of overlapping ties or relationships between various individuals or mutual third parties (De Carolis et al., 2009). At the basis of this thinking is that stronger social ties provide increased motivation to be of assistance and social considerations such as the aspiration to reciprocate or preserve balanced relationships are the driving force behind this (Burt, 1985; Granovetter, 1985). Social cohesion within networks, with the inclusion of trust, promotes reciprocal relationships in which individuals support each other, learn from each other, and share resources with each other (Mehra et al., 2001). As such, based on the discussions of trust, reciprocity and risk propensity as reflective constructs being a function of the latent construct of social network cohesion it is hypothesised:

H2 There is a positive relationship between social network cohesion and intrapreneurship.

2.4 Network homophily

Network homophily, based on the principle that similarity breeds connection within social networks (McPherson et al., 2001) suggests that networks formed are often homogenous with respect to multiple behavioural and intrapersonal characteristics. Studies go on to specify that homophily in a network can influence, and in fact limit, the diversity of resources and information flow, the attitudes within the network and the interactions between the individuals in the network (McPherson et al., 2001).

Networks are integral to connect intrapreneurs with opportunities allowing for organisational growth by facilitating innovation, spreading risks, providing support, providing access to resources as well as building credibility (De Carolis et al., 2009). Individuals connected to diverse networks are more likely exposed to varying worldviews can synthesise and evaluate an issue from multiple perspectives and are more likely to identify a need for discussion and collaboration within a network (Di Domenico et al., 2010). In contrast to this, individuals surrounded by a homogenous network are more likely to think, act and perceive the world in a similar way and have difficulty in sharing their resources or common understanding with those outside their network (Burt, 2005). These factors contribute to the ability of an intrapreneur to facilitate communication, access resources, discover new opportunities to learn and innovate with diverse bodies of

knowledge as well as develop new relationships (Lee et al., 2017; Mehra et al., 2001; Walter et al., 2015).

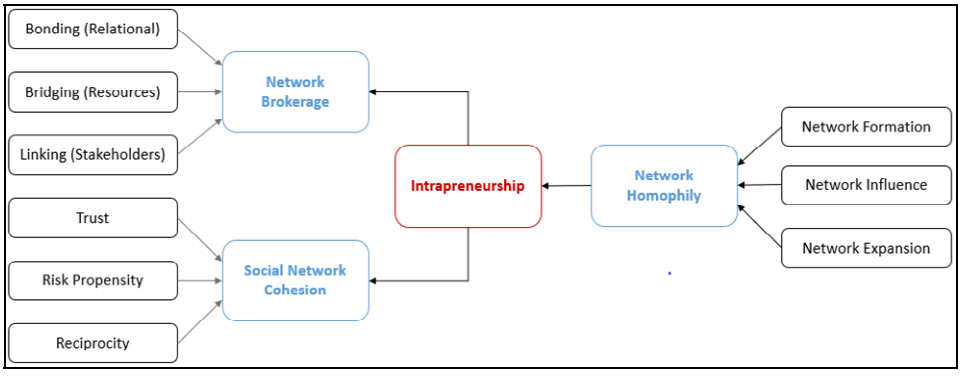
Research shows that an average degree of homophily within a network is the optimal amount allowing for individuals to interact with those who are both similar and dissimilar to themselves. This will also allow for the extraction of resources and information from dissimilar individuals and the discussion and usage of these resources between similar people (Fleming et al., 2007). Furthermore, studies conducted with a focus on individual level intrapreneurship have uncovered that bottom up proactivity is required in order to be successful (Blanka, 2018). More specifically, in order to enable intrapreneurship, individual employees should be involved in out of the box thinking, networking behaviour and leading an initiative in order to be a driving force behind intrapreneurial endeavours (Kuratko et al., 2014). Furthermore, it has been reported that influence tactics have been used for blocking and sanction, manipulation, socialising, negotiating politicking within an organisation (Lee et al., 2017). Intrapreneurs, when utilising the concept of bricolage, make extensive use of their networks to mobilise resources. In order to do this, and to reach resources within their current networks, persuasion and influence are tactics often brought to the fore in order to be successful (Di Domenico et al., 2010; Morikuni et al., 2019). Based on the emerging theory in this regard the study aims to test the following hypothesis in terms of network homophily through the reflective constructs of network formation, network expansion and network influence:

H3 There is a negative relationship between network homophily and intrapreneurship.

2.5 Study conceptual model

As a result of the study research questions and associated hypotheses, a conceptual model was formulated which gives a visual representation of the reflective and formative constructs along with their hypothesised relationship to intrapreneurship, as displayed in Figure 1.

Figure 1 Study model (see online version for colours)



In this model, it is hypothesised that high performing individuals, and thus intrapreneurs, tend to be exceptionally positioned as brokers in the organisational network as a result of their social capital and position within an organisation (Burt, 2005; Mehra et al., 2001). As such, the repercussions of social capital are even more pronounced when it comes to

intrapreneurship as it appears that innovation is just as much a social phenomenon within convoluted organisations as it is a technological phenomenon (Arena and Uhl-Bien, 2016).

Furthermore, to drive innovation and develop an entrepreneurial culture, the extraction and exchange of resources and ideas at all organisational levels is imperative, and thus the brokerage between them, is important (Burt, 2005; Ghalamkari et al., 2021; Soda et al., 2018). The networks that intrapreneurs build within organisations enable them to remain open-minded, unpack and discover new opportunities as well as develop brokering competencies. As a result, the social embeddedness of intrapreneurs within organisations is important to assess when developing intrapreneurial behaviour to drive innovation (Chan et al., 2006; Fleming et al., 2007; Gawke et al., 2019; Nahapiet and Ghoshal, 1998).

To ensure the optimal mobilisation of resources and information for intrapreneurial activities, the use and creation of both internal and external networks is essential (Akhtar and Kang, 2016). In this regard the concept of network formation and expansion facilitating resource bricolage and stakeholder mobilisation in intrapreneurial activities is useful and forms part of the study conceptual model (Di Domenico et al., 2010; Lee et al., 2017).

3 Research method

The research study was cross-sectional in nature and collected primary data in the manner of a self-completed questionnaire. The study unit of analysis was middle managers as they have an integrative role enabling them to shape intrapreneurial behaviour in an organisation (Kuratko et al., 2014; Morikuni et al., 2019). The measurement instrument for this study took the form of electronically distributed self-completed questionnaires (surveys).

3.1 Data collection

Firms were randomly selected from generic sampling frames and databases such as the ‘consulting company listings’, and the ‘chamber of commerce and industry’, all of which are available to the public and which provided convenience for the centralised survey. Limiting the population to middle managers also ensured that the data collected was more homogenous in nature. Initial contact was made via email and telephone and ethical concerns were addressed by ‘safeguarding the respondents’ privacy. Of the 550 questionnaires that were disseminated, 162 were returned, of which 140 were valid, with no missing information which was “regarded as a reasonable response rate, given that a number of emails did not reach the recipients presumably due staff mobility, and/or strict email policy among the organisations surveyed” (Hair et al., 2010). To check for sampling bias, t-tests displayed no significant differences between early and late respondents with respect to managerial level or and region surveyed. Sample descriptions disclose that the bulk of the respondents’ firms are situated in South Africa (72%), UK (13%), Australia (9%) and the remainder in Canada (2.1%), UAE (1.4%), Germany (0.7%), and the USA (0.7%). In terms of industry sector, most of the sample was in from the information technology sector (59%), financial services (25%), and professional services (22%).

3.2 Measures

The survey was designed by identifying relevant constructs, as per the study hypotheses, from literature mostly conducted in different contexts. Since the study comprises of different sub-samples extracted from different countries the extent to which respondents across different constructs and constructs had a comparable/shared interpretation was deemed important and a pilot test was conducted to identify any potential problematic questionnaire items with linguistic ambiguity and to address any comprehension issues. Convenience sampling was then used to pilot the survey questionnaire to 30 respondents who completed the questionnaire in the same way that actual study was conducted, and they were asked to provide feedback on content for improvement. The feedback received from these respondents in terms of understanding, as well as the structure were improved upon prior to the final survey being distributed. In addition to this, based on feedback received, the survey was amended to include a high-level definition or description of the term 'intrapreneurship'.

Table 1 Study measures relating to hypotheses

First order construct	*Second order construct*	*Third order construct*
Bridging	Network brokerage	Intrapreneurship
Linking		
Trust	Social network cohesion	
Reciprocity		
Network building	Network homophily	
Network influence		

To simplify the analysis process, a codebook was produced to arrange each variable in the study by means of a codename. Network brokerage, operationalised as the "bridge connections from one cluster or network to another which generally results in the broker benefitting from differential access to resources and advantages", was sourced from Burt (2005) and Soda et al. (2018). Social network cohesion, operationalised as the state of interactions within a network that are "characterised by a set of attitudes and norms including their behavioural manifestations", was sourced from Chan et al. (2006) and Fleming et al. (2007). Network homophily, operationalised as the "contact between similar individuals which occurs at a higher rate than with dissimilar individuals", was sourced from De Carolis et al. (2009). Intrapreneurship was based on the work of Gawke et al. (2019) where the authors measure intrapreneurship at the individual level and provide evidence of scale validation in terms of the 'employee intrapreneurship scale (EIS)'. All the measured variables were organised as per the study codebook (see Appendix), which were structured as first order constructs, second order constructs and the third order construct of intrapreneurship (see Table 1). This framework was used in all further analyses in terms of the first order dimensions and the different sub-dimensions related to each of the study construct and in line with each of the study hypothesis. The questions related to network homophily were reverse coded, to measure the amount of homophily in a network, without confusing the respondent or influencing the outcome of the study in a biased manner. A 'Likert five-point scale ranging from 1 = strongly disagree to 5 = strongly agree' was used.

3.3 Data analytics

The statistical technique utilised for this study was partial least squares-structural equation modelling (PLS-SEM). In terms of the model, path linkages between the selected first and second order constructs were tested and both the outer (measurement) and inner (structural) models were subjected to reliability, validity, and collinearity testing, respectively (Hair et al., 2019). From this, a finalised structural model was confirmed, and the significance of the path model assessed. This model was then subjected to an overall model assessment, verifying the accuracy of the factors in influencing the practice of intrapreneurship. The PLS algorithm, bootstrapping, and blindfolding methods within Smart PLS were adopted to assess the inner and outer model significance, and model assessment respectively (Henseler et al., 2014).

4 Results

4.1 Model assessment

Scale assessment was conducted to understand the prominent factors from the data, in comparison to the proposed factors derived from the literature, as detailed in Table 1. Building on in this direction, Table 2 shows that the first and each second order construct levels in terms of their reliabilities and the number of components extracted and percentage variance explained. The PLS-SEM outer model was assessed through average variance extracted (AVE) and composite reliability measures where all items with an overall loading of less than 0.7 were removed from each relative first order construct. As summarised in Table 3 the factor loadings for the bridging construct ranged from 0.56–0.76, the linking construct ranged from 0.75–0.81, the network building construct ranged from 0.73–0.81, the network influence construct ranged from 0.73–0.88, the reciprocity construct ranged from 0.54–0.76, and the trust construct ranged from 0.65–0.81. Measured variables which reported a factor loading < 0.7 were removed from the model as per the prescribed threshold adopted (Henseler et al., 2014). In addition, the AVE, which is the square root of the standardised indicator loading, had to be greater than 0.5 for convergent validity. Results indicate that all AVE scores were > 0.5 as per the minimum threshold proposed by Hair et al. (2019).

In terms of discriminant validity, the outer model was assessed using the heterotrait-monotrait (HTMT) criterion which measures the degree of difference between a hypothesised construct and others in a research model (Henseler et al., 2014). If correlations between constructs are less than 0.9, it implies that the specific construct is relatively unique from the others in the model and captures its hypothesised essence (Hair et al., 2019). The HTMT output indicated that no correlations exceeded 0.9 as per the recommended threshold (Henseler et al., 2014). Based on these satisfactory results both the convergent and discriminant validity for the outer model was established.

As the PLS-SEM technique is rooted in ordinary least square prediction and the maximisation of dependent variable variance, levels of collinearity need to be assessed (Hair et al., 2017). High levels of collinearity can lead to predictor variable bias and create unstable path linkages. Henseler et al. (2014) recommend the assessment of the variation inflation factor (VIF) which is interpreted as the inverse of tolerance. The inner model was assessed for collinearity through the assessment of the VIF with obtained

values ranging between 1.2 and 3.6, well below the upper bound of 5 (Hair et al., 2019) indicating that no collinearity concerns were existent in the inner model.

Table 2 Measured variables and reliabilities

Second order	*First order*	*Measured variable*	*Cronbach alpha*	*Components extracted (n)*	*%*
Network brokerage	Bridging	NB_Bonding1	0.78	2	53.41
		NB_Bonding2			
		NB_Bonding3			
		NB_Bridging1			
		NB_Bridging2			
		NB_Bridging3			
	Linking	NB_Linking1	0.66		
		NB_Linking2			
		NB_Linking3			
Network homophily	Network building	NH_Formation1	0.84	2	65.06
		NH_Formation2			
		NH_Expansion1			
		NH_Expansion2			
		NH_Expansion3			
	Network influence	NH_Influence1	0.78		
		NH_Influence2			
		NH_Influence3			
		NH_Formation3			
Social network cohesion	Reciprocity	SC_Reciprocity1	0.69	2	62.40
		SC_Reciprocity2			
		Sc_RiskProp2			
		SC_RiskProp3			
	Trust	SC_Trust1	0.86		
		SC_Trust2			
		SC_Trust3			
		SC_Reciprocity3			

Given confirmation on the outer model and the constructs with associated measured variables, 'descriptive statistics' were calculated where the highest mean scores were on reciprocity (4.14) and trust (4.32) respectively. Social network cohesion reported the highest mean of 4.23 for the second order constructs. In terms of standard deviation, and hence a spread in the data in the second order constructs, network homophily showed the greatest spread at 0.76, followed by network brokerage at 0.54 and then social network cohesion at 0.48. From the first order constructs, network building had the highest standard deviation at 0.86 and reciprocity and trust had the lowest standard deviations, both reporting a value of 0.54 (not shown). This suggests that both the first and second order constructs were clustered around the mean of the scales adopted and there were no

significant outliers noted with a standard deviation within the bounds of ±3 (Hair et al., 2019). Once the outer and inner models were evaluated as acceptable, the path models were assessed for significance.

Table 3 Outer model factor loadings

	Bridging	*Linking*	*Network building*	*Network influence*	*Risk propensity*	*Trust*
NB_Bonding1	0.56*					
NB_Bonding2	0.61*					
NB_Bonding3	0.69*					
NB_Bridging1	0.75					
NB_Bridging2	0.74					
NB_Bridging3	0.76					
NB_Linking1		0.75				
NB_Linking2		0.81				
NB_Linking3		0.78				
NH_Formation1			0.81			
NH_Formation2			0.79			
NH_NetExp1			0.73			
NH_NetExp2			0.87			
NH_NetExp3			0.81			
NH_NetInf1				0.79		
NH_NetInf2				0.88		
NH_NetInf3				0.79		
NH_Formation3				0.73		
SC_Recip1					0.70	
SC_Recip2					0.54*	
SC_RiProp2					0.73	
SC_RiProp3					0.76	
SC_Recip3						0.77
SC_RiProp1						0.65*
SC_Trust1						0.70
SC_Trust2						0.81
SC_Trust3						0.72

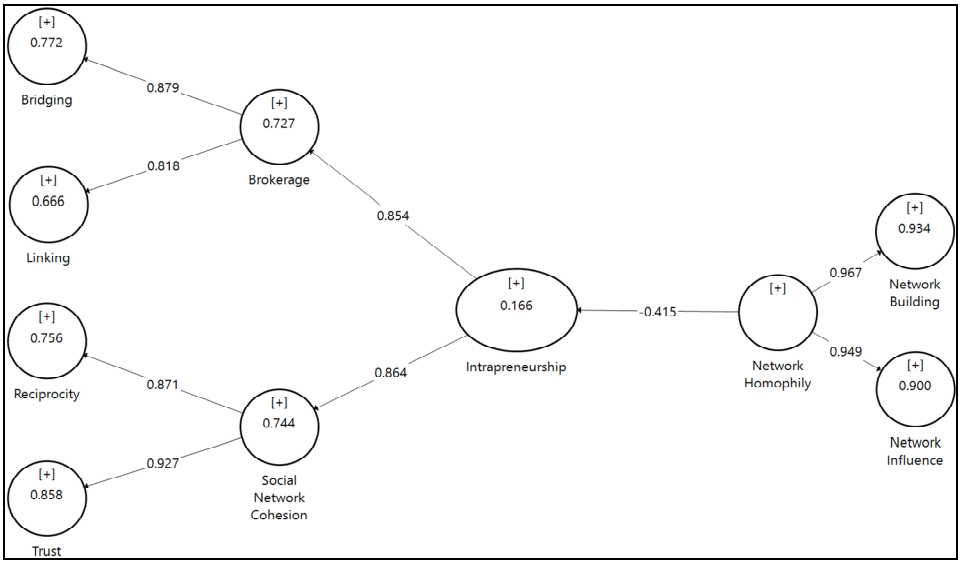
Model assessment for the research model was verified by assessing the standard root mean square (SRMR), coefficient of determination (R^2), and Stone-Geissers Q^2. SRMR is an evaluation between the discrepancies of the observed and expected relationships where an upper limit of 0.10 is recommended for a good model fit (Hair et al., 2017). The Stone-Geissers value ranges from 0 to 1, whereby values greater than 0.35 is classified as a large effect, between 0.15 and 0.02 is medium and less than 0.02 is weak (Hair et al., 2019). In this regard, the overall model fit was adequate, as suggested by the SRMR value of 0.14. Network building, network influence, bridging, trust, reciprocity and linking reported large predictive relevancy values ($Q^2 > 0.35$). Social network cohesion

and network brokerage reported medium predictive relevancy values ($Q^2 > 0.15$). It is imperative to take heed that a Q^2 value was not calculated for the second order construct of network homophily as it is modelled as an independent variable. Intrapreneurship reported a Q^2 of 0.05 which was regarded as poor but relevant and overall, there are significant influences from all constructs, see Table 4. Based on this assessment, and in terms of predictive accuracy, the overall model assessment can be classified as significant and relevant (Hair et al., 2019), providing support for the study hypotheses.

Table 4 Structural model assessment (Stone-Geisser, SRMR)

Construct	*SSO*	*SSE*	*Q^2 (= 1 – SSE/SSO)*
Network building	700	298	0.57
Network influence	560	253	0.55
Bridging	420	198	0.53
Trust	560	308	0.45
Reciprocity	420	252	0.40
Linking	420	257	0.39
Network brokerage	840	562	0.33
Social network cohesion	1,120	759	0.32
Intrapreneurship	1,820	1,725	0.05
SRMR was reported at 0.14			

Figure 2 Refined study model



Based on the combined outputs from the PCA and validity evaluation, the refined structural model is presented in Figure 2, which was used to prove or disprove the research hypotheses. While the first order constructs were refined, no new measurement items were introduced into the refined model. This refined model was assessed to determine the overall model assessment and predictive determination. From the refined

structural model, all path loadings show a positive relationship with related constructs ranging from 0.927 for trust to social network cohesion, to 0.818 for linking to network brokerage, and to 0.415 for network homophily to intrapreneurship. The structural model that shows that network building, network influence, bridging, trust, reciprocity and linking had the most significant influence on their related second order constructs, and account for the largest variance in intrapreneurship, providing support for H1, H2 and H3.

5 Discussion

The study findings contribute to business management literature by showing the unique effects of network brokerage, social network cohesion and network homophily associated with intrapreneurship.

In terms of the study hypotheses the relevance and usefulness of the significant results is apparent when considering that activities associated with network brokerage (H1) allow for bonding and bridging with peers and as a result, providing access to non-redundant and valuable resources and unlock intrapreneurial activity in the process (Akhtar and Kang, 2016). The positive findings confirm that 73% of variance is estimated in intrapreneurship because of network brokerage. This positive and significantly predictive relationship is coherent with the arguments that social capital and its' existence within a network provides an advantage based on the creation of connections within networks which aid the intrapreneurial process (Urbano et al., 2013). The findings highlight that bridging social capital had a higher path coefficient with network brokerage, indicating that between bridging and stakeholder linking, bridging has a greater influence on the network brokerage and intrapreneurship link.

By combining insights from different sources of literature, H2 in terms of the second order construct of social network cohesion and its relationship with intrapreneurship shows positive and significant results with relatively high path coefficients (0.864). This indicates that social relationships which are built on a basis of cohesion allow the intrapreneur to mobilise others in a common direction and share knowledge and ideas with individuals within a social network, thus bolstering intrapreneurial success (Chan et al., 2006). This relational trust often arises from individuals being embedded in a social network which has the ability to product joint efforts in the direction of a goal and facilitate the flow of resources within a network. In addition to this, trust promotes the development and longevity of relationships with minimal maintenance requirements (Adler and Kwon, 2014).

For H3, a negative and significant relationship was confirmed and is coherent with prior findings insofar network homophily can influence and limit the diversity and flow of resources and information within a network as well as the attitudes and interactions of individuals in that network (McPherson et al., 2001). Intrapreneurs in diverse networks are more likely to identify a need for discussion and collaboration than those who are in similar or homogenous networks. The stance that innovator and thus intrapreneurial networks should disclose lower levels of homophily to promote collaboration between complementary individuals as opposed to substituting individuals was confirmed by the study findings. Moreover, network homophily has the ability to facilitate the concept of bricolage in terms attaining scarce resources as well as facilitate and unblock intrapreneurial endeavours (Di Domenico et al., 2010).

6 Conclusions and implications

This study provides unique empirical contribution to research by examining the relationship between social capital and intrapreneurship. By concentrating on network brokerage, social network cohesion and network homophily the study extends the current research agenda by drawing attention to these constructs and how they can be measured and modelled to explain intrapreneurship.

Management implications of the study relate to the ability to identify relevant social capital competencies that can mobilise organisations towards unlocking the benefits of intrapreneurship and as a result, strategic renewal, and value creation. The study findings have specifically highlighted the importance of breaking down organisational silos to limit network homophily, allow intrapreneurs to access, and mobilise resources by using their networks to leverage trust, foster reciprocity and create relationships between disparate individuals or teams using network brokerage. As a result of this, management should take note of the important bridging roles middle managers have to facilitate, develop, and unblock intrapreneurial activities to create an intrapreneurial culture for the firm. The findings also have relevance at a more global level where prior studies (e.g., Urban, 2021) emphasise how economic sustainability result from disruptive and innovative opportunities derived at the firm level, as opposed to self-employment opportunities.

In terms of study limitations, as with most cross-sectional studies, this design prevents causation to be attributed to the factors under investigation. Future research may benefit by employing a longitudinal research design and relying on observation and interviews that could contribute to providing a richer understanding of social capital and intrapreneurship. Further, the constructs identified for use in the conceptual model were not exhaustive and thus do not represent all the variables that could impact intrapreneurial success from a social capital perspective. Future research endeavours could include accommodating aspects of digitisation, technology, and knowledge management in relation to social capital and intrapreneurship.

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Appendix

Table A1 Variable code book for the study measures

Variable code	*Second order construct*	*First order construct*	*Question*
NB_BONDING1	Network brokerage	Bonding	… build strong relationships within their network
NB_BONDING2	Network brokerage	Bonding	… facilitate collaboration within their network
NB_BONDING3	Network brokerage	Bonding	… introduce diverse individuals to each other within their network
NB_BRIDGING1	Network brokerage	Bridging	… acquire resources for their network
NB_BRIDGING2	Network brokerage	Bridging	… facilitate the exchange of resources within their network
NB_BRIDGING3	Network brokerage	Bridging	… identify resource gaps within their networks
NB_LINKING1	Network brokerage	Linking	… connect their network to junior stakeholders in an organisation
NB_LINKING2	Network brokerage	Linking	… connect their network to senior stakeholders in an organisation
NB_LINKING3	Network brokerage	Linking	… connect their network to stakeholders in different business units

Appendix

Table A1 Variable code book for the study measures (continued)

Variable code	*Second order construct*	*First order construct*	*Question*
NH_NETEXP1	Network homophily	Network expansion	… engage in activities to attract individuals with a similar social background to their network
NH_NETEXP2	Network homophily	Network expansion	… engage in activities to attract individuals with similar expertise to their network
NH_NETEXP3	Network homophily	Network expansion	… engage in activities to attract like-minded individuals to their network
NH_FORMATION1	Network homophily	Network formation	… establish networks by connecting with individuals with similar expertise
NH_FORMATION2	Network homophily	Network formation	… establish networks by connecting with individuals with similar social backgrounds
NH_FORMATION3	Network homophily	Network formation	… establish networks by connecting with like-minded individuals
NH_NETINF1	Network homophily	Network influence	… gain cooperation from individuals with similar expertise within their network
NH_NETINF2	Network homophily	Network influence	… gain cooperation from individuals with similar social backgrounds within their network
NH_NETINF3	Network homophily	Network influence	… gain cooperation from like-minded individuals in their network
SC_RECIP1	Social cohesion	Reciprocity	… engage in the reciprocal exchange of resources with their network
SC_RECIP2	Social cohesion	Reciprocity	… exchange favours ‘in kind’ with their network
SC_RECIP3	Social cohesion	Reciprocity	… willingly assist others within their network
SC_RIPROP1	Social cohesion	Risk propensity	… draw knowledge from their network to increase their risk-taking propensity
SC_RIPROP2	Social cohesion	Risk propensity	… leverage their network expertise to reduce risks in intrapreneurial ventures
SC_RIPROP3	Social cohesion	Risk propensity	… seek advice from their network to reduce risks in intrapreneurial ventures
SC_TRUST1	Social cohesion	Trust	… build trust within their network to allow for the sharing of resources
SC_TRUST2	Social cohesion	Trust	… ensure that they are dependable to individuals within their network
SC_TRUST3	Social cohesion	Trust	… maintain trust with individuals within their network