

Advancing US small business apparel production: a state-level mixed-method exploration

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Abstract

Purpose – This study highlights the impact of attaining and incorporating knowledge and building relationships with other firms in US apparel production.

Design/methodology/approach – Producers of apparel and sewn products operating within a US state form the sample for this mixed methods exploration. Study 1 involves a qualitative analysis of the producers highlighting knowledge in interorganizational discussions. Study 2 quantitatively measures responses from 38 producing firms. Ordinary least squares (OLS) regression was used to measure associations, and simple slopes were computed to examine interactions.

Findings – The knowledge exchanged, according to participants in study 1, was limited, thus warranting further examination. Results from study 2 revealed strong associations among knowledge absorptive capacity, social interaction and people-oriented culture with network ties. A two-way interaction effect was found for absorptive capacity and social interaction, indicating association between social interaction and network ties was more positive at higher levels of absorption capacity and vice versa.

Research limitations/implications – Findings provide theoretical and applied support for building network ties. This research operationalizes complicated-to-measure constructs critical to the empirical measurement of junctions from two theoretical frameworks, in the context of a specific industry. Though acceptable for exploratory research, additional work is needed to refine reliability measures and to examine a national sample.

Originality/value – This study links elements of social capital- and knowledge-based views of the firm necessary for reviving US apparel production. Broader outcomes from this research include job creation providing support and growth in the US sewn apparel and goods industry that will drive US economy.

Keywords Knowledge absorptive capacity, Network ties, Social interaction, Apparel producers

Paper type Research paper

Introduction

The USA opened its textiles- and apparel-producing markets to foreign sales in 1974 and has been one of the few nations that have paid little notice to the research needs of domestic industry in terms of needed regulations, labor policies and plans for advancing development (US Congress, Office of Technology Assessment, 1987). This move to source from low cost overseas locations resulted in loss of jobs and a restructuring of the US textiles and apparel industry (Kilduff, 2005; Nelson Hodges and Karpova, 2006; Shelton and Wachter, 2005). In 2006, approximately 91% of apparel sold in the US market was imported (Chi and Kilduff, 2010). The USA is not alone in this experience as reported by Adler (2004) in Germany and Macchion and Fornasiero (2020) in Italy.

US tariffs on fashion apparel items have contributed to trade tensions as the fashion industry recently accounted for 6% of all imports but paid 51% of all US tariff receipts



(Berg *et al.*, 2019). After three decades of continual rising imports and tariffs in textiles and apparel, an impressive number of companies have built new US facilities for apparel production (Demicheva, 2013; Kim, 2013; Markowitz, 2012; Moser and Montalbano, 2018) or have moved to nearshoring (Andersson *et al.*, 2018). For textile and apparel supply chains, US production holds increasing benefits in terms of delivering quick-turn production, high-quality fabrics and apparel and the level of control that retailers seek (Feitelberg, 2017; Friedman, 2017; Stephens, 2019; Yu and Kim, 2018). Macchion and Fornasiero (2020) indicate companies, many in Italy, have found a need for backshoring which involves shifting production from the foreign countries back to domestic locations for better meeting fast-changing consumer demands and generating quicker production response time. With consumers reportedly willing to pay higher prices for US-made apparel (Clifford, 2013; Hays, 2020), reshoring or backshoring a fragment of apparel production would significantly impact US gross domestic production figures and provide entrepreneurial and subsequent job opportunities.

While forces of change have been gathering strength for over a generation, relatively young companies and small-sized enterprises comprised of apparel design, development and production often experience inadequate knowledge in navigating the complex and rapidly changing apparel industry. Pertinent to the study of apparel production are the linkages that exist along the industry supply chain enabling the movement of knowledge to and from the apparel producers. Knowledge in high-technology sectors must be continually replenished (Lane and Lubatkin, 1998). From the knowledge-based view of the firm, Kogut and Zander (1992) posited that social capital was critical for knowledge and business success competencies. Based on both social capital- and the knowledge-based view of the firm, the purpose of this research is to examine what advances external firm knowledge sharing providing insights for enhancing firms' reshoring or backshoring decisions and strengthening of small-sized firms involved in US apparel production. To launch an investigation, we explored a single US state in this study as there was evidence from interactions with small-sized firms involved in apparel products manufacturing of interest in advancing business exchange for firm development and in moving toward a cluster economic approach. Additionally, the state ranked fifth among the 25 largest states in the USA for new start-up activity, with a 35% rate of new entrepreneurs in 2016, versus the US average of 31% (Tareque *et al.*, 2017). Findings generated from this study of a single state's small firm activities and perceptions were not intended to yield information generalizable to the USA but to form the basis for further inquiry beyond the state at the national or international level.

This study is organized as follows. Two theoretical foci are presented with purported conceptual connections, and then from the theoretical perspectives, concepts are defined and relationships modeled and hypothesized. The methods and findings for this mixed methods research are reported, with study 1 addressing the qualitative aspects and then study 2 addressing the quantitative aspects. This section is then followed by discussion and conclusions including the limitations and implications for future research.

Literature review

The knowledge-based view perspective, the first theoretical focus, is recognized as an essential process in supporting and maintaining firm-level competitive advantages in the global marketplace. However, the knowledge management literature often focuses on internal knowledge processes, while the study of external knowledge process is less frequently investigated (Grant and Baden-Fuller, 2004; Scuotto *et al.*, 2017; Teece, 1992). Examples include Ashton's (2006) network study of United Kingdom (UK) knitting companies located in proximity to each other and found both internal and external knowledge exchange with many of the firms focused on building global network collaborations. Yli-Renko *et al.* (2001)

examined the external relational resources of high-technology ventures in the UK and found social interaction and network ties, as dimensions of social capital theory, were associated with higher knowledge acquisition. Acquisition of knowledge is somewhat different than knowledge absorption capacity in that acquiring the knowledge does not necessarily translate into application or use of the knowledge. Existing firm capabilities are often not readily applicable without the capacity for development of additional or new capabilities. This is encompassed in the concept of knowledge absorptive capacity.

Central to social capital theory, the second theoretical focus is the concept that social connections or networks, which may be characterized by norms of accepted behavior and trust, enable participants to effectively act together in pursuit of shared objectives (Granovetter, 1973, 1983; Putnam, 1995). A general definition of network by Hoang and Antoncic (2003) considers the network as “consisting of a set of actors and some set of relationships that link them” (p. 167). Strategic networking moves the concept of networking from a sociological view to a goal-oriented behavior between the business and other entities along the supply chain, thus signifying collaborative conduct motivated by a need to secure firm success (Borch and Huse, 1993; Inkpen and Tsang, 2005; Jarillo, 1988). From a strategic network perspective, firms invest in networking when there is potential to share resources needed for succeeding in a competitive market. Miller *et al.* (2010) found resource sharing as a key antecedent to small firms’ assessment of benefits derived from networking. Leveraging relational resources has been found to be particularly valuable to younger firms who are frequently disposed to newness and inexperience (Bruneel *et al.*, 2010) and may provide insights as to how some firms survive with limited firm resources.

Kogut and Zander (1992) describe the knowledge-based view of the firm as store houses of knowledge and capabilities. Knowledge formation and innovation are generated from new combinations of knowledge and other intangible as well as tangible resources (Cohen and Levinthal, 1990). Research suggests that building networks for resource sharing varies according to the life cycle phase of entrepreneurship with more frequent exchange of information during the earlier stages (Greve and Salaff, 2003). It has also been found that knowledge-based entrepreneurs are more involved with networking than traditional entrepreneurs (Johannisson, 1998). Based on the literature, it seems that understanding more about what explains network ties may assist the apparel industry-related firms in fabricating relation-specific assets to increase the likelihood of firm success, which lends a strong justification to this study.

In this paper, we extend the above literature by exploring how apparel-producing firms leverage interorganizational relationships to fortify external knowledge. Specifically, we propose that the degree to which firms use network ties, as external relationships, is regulated by the amount of social capital embedded in those relationships, in the form of social interaction and a people-oriented firm culture, and the ability of the firms to understand and incorporate knowledge, in the form of knowledge absorptive capacity.

Our study makes several contributions to the literature. First, much of the work was typically focused on examining firm access to tangible internal resources (Cohen and Levinthal, 1990) until research by Malhotra *et al.* (2005) first concentrated on the minimally studied aspects of new knowledge creation among firms in a supply chain. Interest in the intangible transfer of external resources, namely knowledge, in promoting economic growth and creation of jobs has seen significant growth for over two decades (Wynn and Jones, 2018). This study focuses on intangible external resources, including accessing knowledge, and extends the current research with an exploration involving potential impacts of external linkage formation from social interaction as well as consideration of firms’ internal culture. Second, this study links elements of social capital- and knowledge-based views of the firm for a section of the manufacturing industry that has been long overlooked and is necessary for reviving US apparel production in these turbulent economic times (Executive Office of the

President, 2015; US Congress, Office of Technology Assessment, 1987). In sum, this research operationalizes complicated-to-measure constructs critical to the empirical measurement of junctions from two theoretical frameworks, in the context of a specific industry.

Conceptual framework and hypotheses

The knowledge-based view of the firm perspective advocates knowledge as a source of sustainable competitive advantage (Kogut and Zander, 1992). For technology-based firms, knowledge must be persistently sought for replenishment (Lane and Lubatkin, 1998). Considering knowledge allocation is recognized as a social process (Kogut and Zander, 1992), social capital may be critical for the long-term success of firms incorporating high levels of technology. The social capital perspective considers that networks are formed from social structure. Network links provide the means through which individuals learn about social context providing bridges or ties to new information and resources (Granovetter, 1973, 1983).

We examine the connections and potential interactions between constructs from these two frameworks to explore relationships that potentially provide insights for the reshoring and strengthening of US apparel production. Constructs and prior relative theory-based research are presented along with operational definitions. Hypotheses are generated to communicate the proposed relationships, and a conceptual model depicts hypothesized relationships (see Figure 1).

Network ties

The conceptual work advancing the study of networking originated in the 1980s with influential work by Bourdieu (1986) and Coleman (1988) and has been subsequently extended for a variety of sociological studies of groups for more than 30 years. Networking has increasingly been recognized as an important factor in the entrepreneurial process (Elfring and Hulsink, 2007; Lamie *et al.*, 2015; Lefebvre *et al.*, 2015; Jack, 2010; Jack *et al.*, 2010). Though network ties were derived from concepts inherent in social capital theory, the construct is also considered a logical development of the knowledge-based view in that network interactions are driven by a search for information to reduce risk and leverage firm advantage (Yli-Renko *et al.*, 2001). Prior research has shown that the self-effective governing mechanisms, such as norms of reciprocity and trust, must be in place for sharing know-how (Dyer and Singh, 1998;

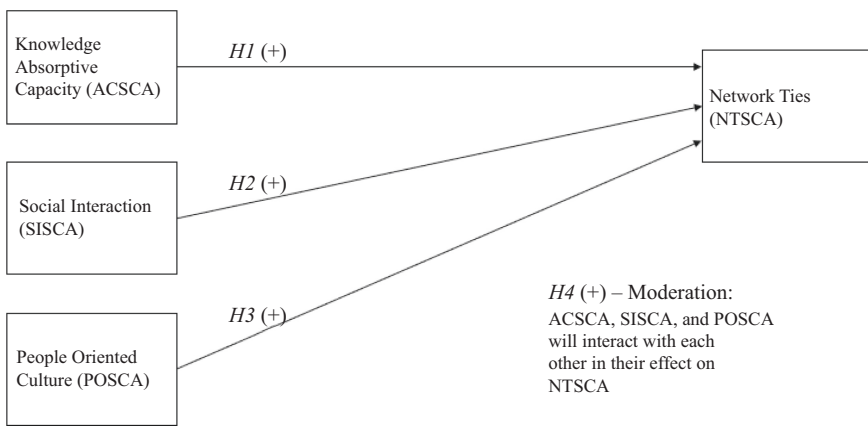


Figure 1.
The conceptual model

Miller *et al.*, 2007, 2010). Considering network ties as the conduit for information emphasizes the need to understand what opportunities, efforts or benefits are associated with the movement or transfer of information among individual firms, with firms the unit of analysis. Jack (2010), in examining the different approaches that have been followed in the study of networks, found the underlying need for networking reflected the social context of the network members and that the links or ties were built upon social relationships. Findings from qualitative research by Jack *et al.* (2010) suggested that over time, self-interest gave way to joint interest. Thus, defining networking as primarily based upon financially driven motivations is considered too narrow. Network ties are operationalized in this paper as converging social- and knowledge-based external linkages that emerge in support of apparel producers. Networking has been explicitly integrated to build understanding about the strength of group-oriented actions, such as an alliance of Italian knitting and apparel manufacturers (Putnam *et al.*, 1993), embeddedness in the New York City apparel industry (Uzzi, 1996), strategic alliances in the fashion sector (Wigley and Provelengiou, 2011) and networking among small community apparel business owners (Besser and Miller, 2011; Miller *et al.*, 2007).

Knowledge absorptive capacity

Research from the knowledge-based view approach suggests that firms' access to external knowledge sources does not necessarily translate the information into firm application. The firm must possess capacities that enable external knowledge to be understood and incorporated. Cohen and Levinthal (1990) considered absorptive capacity as the adeptness a firm acquires over time due to the accumulation of a relevant base of knowledge. For this study, knowledge absorptive capacity is defined as the firm's adeptness to evaluate, assimilate and accumulate new external knowledge (Lane and Lubatkin, 1998). As a result of accessing external sources of knowledge, the scope of learning is broadened (Dyer and Singh, 1998), further enhancing the sharing of information and accordingly strengthening the external network ties (Larson, 1992). Early work by Divita *et al.* (2006) favored building relationship models that stimulated the free flow of information and suggested that textile industry partnerships could potentially provide cooperation and stability that would help firms in meeting the rapidly changing nature of the industry. Thus, we hypothesize,

H1. Knowledge absorptive capacity is positively associated with a firm's network ties.

Social interaction

Learning relationships comprise a pattern of interactions that influence learning (Lane and Lubatkin, 1998). Kogut and Zander (1992) maintained that the knowledge acquired was a significant outcome of closer social interactions. Prior research has found the higher the level of social interaction among exchange partners, the stronger the level of information exchanged (Larson, 1992). Work by Yli-Renko *et al.* (2001) and Nahapiet and Ghoshal (1998) considered social interactions between the firm and the customer. We extend this interchange to include additional members along the apparel production supply chain and contend that social interaction provides the apparel-producing firms with insights that result in know-how, which in turn advances the building and maintenance of network ties. Research by Divita *et al.* (2006) suggested that textile industry strategic partners, in search of market competitiveness, did receive social benefits from others in the partnership. Social interaction is operationally defined as the relational component generated by maintaining close social and frequently personal relationships with industry members external to the firm. Social interactions thus support interconnections among individuals. We propose the following hypothesis:

H2. Social interaction is positively associated with a firm's network ties.

People-oriented culture

Key concepts in social capital theory suggest that social interactions and organizational cultures that are people oriented can be preconditions for sharing of knowledge and building ties (Yli-Renko *et al.*, 2001). Defining the kind of organization and what is important within the organization are patterns of mutual beliefs and goals, such as sharing and supporting people (Despande *et al.*, 1993). Prior research suggests that there is a mix of different sets of values, beliefs and assumptions relative to any organization's culture (Limaj and Bernroide, 2019), but little research has investigated potential effects of the organization's culture on network ties. A people-oriented culture is thus operationally defined as the internal personal relationships generated within the firm's environment. Thus, the third proposed hypothesis in this research is as follows:

H3. A firm's people-oriented culture is positively associated with a firm's network ties.

Moderation effects

Given that individually knowledge absorptive capacity, social interaction and people-oriented culture are viewed as determinants of relationships with network ties, the first three hypotheses pertain to these relationships as direct effects. Prior discussion of inferred connections between the knowledge-based view of the firm and social capital warrants further examination. Hence, the fourth hypothesis considers the moderation or interacting effects of the three determinants on network ties as we examine proposed converging social- and knowledge-based linkages. We propose that

H4. The direct effect on network ties will be moderated by the interaction of a firm's

H4a. Absorptive capacity with social interaction.

H4b. Absorptive capacity with people-oriented culture.

H4c. Social interaction with people-oriented culture.

Methods

Exploratory sequential mixed-method design

To address the hypotheses, a mixed-method approach using an exploratory, sequential design was developed to explore perceptions of knowledge sharing by small-sized apparel producers in a single US state. In this exploratory, sequential, mixed methods research, we followed a set of procedures involving collection of first qualitative data, followed by quantitative data in response to the research goals and hypotheses and then the integration of the data (Creswell and Creswell, 2018; Tashakkori and Teddlie, 2010). This design is prevalent when investigators need to understand a population before administering an instrument. Study 1 involved a qualitative investigation exploring small-sized apparel manufacturing firms as well as start-up or entrepreneurs involved in design, product development and production. Building on discoveries from the qualitative exploratory phase, study 2 involved a quantitative approach to augment the first phase and to develop a deeper understanding of the firms' means of generating knowledge or information.

Study 1

In the exploratory, sequential, mixed-method design, qualitative data were first collected using multiple procedures in a grounded research approach (Bollingtoft, 2015). This research approach, defined by Glaser and Strauss (1967), reflects the data that are grounded in the behavior, words and actions of the group under study.

Data collection. Interviews and observations were conducted in the environments in which the actions took place, such as the firms' facilities or while the firms interacted at annual events as they exchanged social and professional information. Also considered during the interviews were cooperative alternates such as developing a geographic center of operation or what has been termed a cluster economy. Data also included organizational documents such as minutes of meetings, email communications, meeting presentation notes and slides, as well as firm-level financial planning. The data were collected within a western US state from 2014 through 2018. In total, two criteria were adopted for selecting the firms of the target population: (1) they were involved in or provided a supporting capability to the design, development or production of apparel and/or (2) they attended one or more annual apparel summits that were held within the designated western state.

Regarding the selection of the second criterion, a well-attended apparel summit event was held each year to bring focus to reshoring through cooperation in US apparel production for companies and communities of all sizes. Many community leaders continue to seek opportunities to build or return manufacturing to this western state. At one time, apparel-producing companies provided employment in rural and urban areas of the state; however, plants closed with increased importation of apparel. This is consistent with the national numbers indicating productivity in the apparel and textile industries is increasing in costs and textile furnishing mills lead the recorded increases by 17.6% in term of labor costs required to produce a unit of output. In other words, hourly labor and compensation costs growth exceeded productivity growth (US Bureau of Labor Statistics, 2020). This state's production occupation, involving five textiles and apparel production categories, ranges from 0.018 to 0.452% per 1,000 jobs across the five categories, whereas the national number is 1.80% (US Bureau of labor Statistics, 2019a).

There is evidence that manufacturing within this western state is moving toward a cluster economic approach. An example, and presentation at an apparel summit event, includes the recent planning and creation of a 164-acre manufacturing campus in a rural area of the state that opened in the early 2019 (Peterson, 2018). This is a clustering of companies focused on innovation and comprised of collaborative investments by Mayfly Outdoors and Wedge brands as well as the community's urban renewal agency. Surrounding the campus is a mix of housing, live-work studios, a hotel, supporting retail and commercial firms, as well as natural trails and river parks. Prior research conducted in Canada by Campaniaris *et al.* (2015) found difficulties in clustering as a strategic response to global, low cost suppliers. Low levels of open communication and cooperation were not found to fortify small- and medium-sized enterprise (SME) horizontal clustering, and thus, a closer examination of US SMEs is warranted for examining concepts involving social capital and knowledge sharing.

The business environment in this western state indicates a cluster strength of 66.9%, meaning the state is considered in the top quarter of all US regions for developing clusters (Delgado *et al.*, 2010). Harvard Business School's US Cluster Mapping Project (2018) suggests that when economic activities among a set of related industries are established in a given location, linkages begin to have meaningful impact on the clustered companies by enhancing their performance and opportunities for collaborations. In addition, strong clusters are credited with aiding in the formation of new establishments and are associated with start-up firm survival (Mills *et al.*, 2008). Cluster development requires considerable work, and one suggested way to aid in scaling and strengthening cluster development is through information exchange and establishing networks (Donahue *et al.*, 2018).

Sample. We monitored social and professional interactions and presentations throughout four annual apparel summit events. Participants in the summit averaged approximately 250 individuals in attendance including apparel manufacturing investors/owners, production managers and workers, product development entrepreneurs, key national manufacturing executives, equipment and raw material suppliers, education/training providers,

manufacture publishing, community development and leaders in state government and nonprofit agencies.

Beyond the documented ten discussions occurring at four points in time (2014, 2015, 2016, 2018), a further breakdown of qualitative data collection involved open-ended interview questions such as “What have been some of the biggest challenges facing your apparel production in the US?”, followed by specific probes to explore participants’ experiences or observations. The breakdown of 25 interviews involved 11 new cut and sew firms’ investors or managers (operating in the start-up phase), three owners of existing apparel manufacturing firms (operating from five to eight years), five city- or county-level economic developers, three apparel production training educators and three interviews with leaders of a successful farm-based coop for their insights as to network building. Interviews were conducted largely via telephone and the duration varied from 45 min to 90 min. Additional data were also collected through six sets of field notes and observations at cut and sew centers. Our multiinformant data collection strategy was to explore a wide range of firms and to revisit with participants multiple times providing insights into the challenges facing apparel manufacturing firms in securing knowledge and building relationships in our exploration of apparel production across the state.

Analysis and results of study 1. Qualitative content analyses first involved coding the data and then collapsing the codes into broad themes. Most forms of qualitative content analysis consider counting codes from text to hold a position within the broad range of analytic techniques for qualitative data (Morgan, 1993). Qualitative analysis uses the data as the source of codes and provides an unobtrusive way to study the phenomena providing insights as to how the words are employed (Hsieh and Shannon, 2005). Coding involved 158 codes regrouped into 74 themes. Interrater reliability of document coding was established at 84.5%, and NVivo was then used in the analysis of the 35 documents. A word count generated in NVivo displayed the concept of “know, knowing or knowledge” as the most prevalent wording expressed across the data totaling 1,575 references. We returned to several of the interviewees to probe for further meaning in terms of their references to knowledge and found many perceived securing knowledge to be limited and that there were few who would disclose or share specific information in response to requests for guidance in solving industry-related problems. These real-world findings reinforced the need for further examination building upon existing theorized relationships expressed in the four hypotheses.

Study 2

The second phase involved rigorous purposeful sampling with the same population from the first phase. For assessing validity in mixed methods design, drawing upon the same samples in both phases of the study maximizes the importance of the first phase explaining the second phase (Creswell and Creswell, 2018). Based upon theorized relationships and findings from the qualitative study, an online survey instrument using Qualtrics was developed and implemented in spring of 2019. Qualtrics is an online software program that was developed in response to academic research needs and is dominant in US industry use (Qualtrics Expands, 2020).

Instrument development. To examine direct effects (H1, H2, H3) as well as two-way interactions effects suggesting moderation among independent variables (H4, H4a, H4b, H4c), relative questions from prior studies were incorporated or modified for measuring the four key constructs. The survey was developed, pretested and administered to a sample consisting of all entities involved in apparel production who had attended an annual apparel summit event and had been included in study 1 interviews. The survey was comprised of items that were formatted as seven-point Likert-type scales, categorical and open-ended formats. Scales were created by summing the means scores for each seven-point item in the scale.

A total of four scales were developed and assessed for reliability along with calculation of means, standard deviations and correlations (see Table 1). Absorptive capacity was measured with four items adapted from research by Cohen and Levinthal (1990) and Lane and Lubatkin (1998). Cronbach's alpha was 0.67, and the scale was labeled ASCA. Social interaction consisted of two items generated from the work by Johannisson *et al.* (1994) and Yli-Renko *et al.* (2001). Cronbach's alpha was 0.79 and labeled SISC. People-oriented organizational culture consisted of three items adapted from work by Cameron and Quinn (2006) and Deshpande *et al.* (1993). Cronbach's alpha was 0.85, and the scale was labeled POSCA. Networking ties consisted of ten items based on work by Henry and Vollan (2014), Teece (1992) and Yli-Renko *et al.* (2001). Cronbach's alpha was 0.79, and the scale was labeled NTSCA. Cronbach's alpha and correlation scores suggest adequate to strong reliability for exploratory research. Hair *et al.* (2010) suggested values as low as 0.60 may be acceptable for exploratory research, and Nunnally (1967) indicated values as low as 0.50 were appropriate for exploratory research, but further refinement is noted for measuring absorptive capacity.

An email was first sent to the sample population requesting participation in the online survey to better understand the range of opportunities and challenges experienced by a variety of firms involved in production of apparel. In total, three attempts were made to secure responses (Dillman *et al.*, 2009). Given some of the email address were no longer valid as individuals left or closed their businesses, there were 170 possible valid email addresses. A total of 48 responses generated 38 completed responses for a 28% response rate. Recognized limitations resulted from the small number of informants and survey nonresponse; however, for our exploratory purposes, a response rate near 24.5% is considered average for online survey responses (FluidSurveys Team, 2014).

Sample. The average respondent could be described as the owner of a self-defined entrepreneurial business that was in a growth phase and had been operating since 2010. The firms participating were small enterprises employing an average of ten full-time employees and approximately two part-time employees.

Respondents considered the degree of innovation pursued by their firm to be medium ($M = 58.3$) on a 100-point scale ranging from "low" to "radical." Few reported international sales for their business ($M = 7.00\%$). Participants considered their business to be fairly successful ($M = 4.72$ on a seven-point scale). The majority were females (32% males, 68% females) with an average age of 49 years. The larger number of female participants corresponds with the national number of women employed in various areas of apparel and textiles production reported in 2019, ranging from 72.4 to 75.4% (US Bureau of Labor Statistics, 2019b). Most held BS degrees and had average to more than average amounts of prior experience in the business before launching their own firm ($M = 3.68$ on a five-point scale). Their most important planning strategy involved developing their professional skill as a business owner ($M = 5.87$ on a seven-point scale).

Analysis and results of study 2. Means, standard deviations and correlations were examined for ACSCA, SISCA, POSCA and network ties NTSCA (see Table 1.) For the correlations, r_{AC} is the correlation of the row variable with ACSCA, r_{SI} is the correlation with SISCA and r_{PO} is the correlation with POSCA. Correlations were strong between the independent variables ACSCA and SISCA and the dependent variable NTSCA ($r = 0.67$,

Table 1.
Scale means, standard
deviations and
correlations

Variable	<i>N</i>	Mean	SD	r_{AC}	r_{SI}	r_{PO}
Network ties (NTSCA)	38	5.06	0.81	0.67	0.60	0.07
Absorptive capacity (ACSCA)	38	5.64	0.72	—	0.26	0.24
Social interaction (SISCA)	38	4.97	1.38	—	—	0.27
People-oriented culture (POSCA)	37	5.28	0.85	—	—	—

$p < 0.001$ and $r = 0.60$, $p < 0.001$, respectively). The correlations between the independent variables were relatively weak and did not indicate potential issues with multicollinearity (Hair *et al.*, 2014). POSCA had a low, nonsignificant correlation ($r = 0.07$, $p = 0.674$) with NTSCA. Scale mean scores ranged from 4.97 to 5.64 on seven-point scales.

Direct effects (H1, H2, H3) were examined, and two-way interactions were considered for assessing moderation among independent variables (H4, H4a, H4b, H4c). Ordinary least squares (OLS) regression was performed with ACSCA, SISCA and POSCA as independent variables and NTSCA as the dependent variable. We then used the *R* statistical software package emmeans (Hornik, 2020; Lenth, 2019) to estimate the simple slopes for the interaction plots and to generate graphics illustrating moderation (Table 2 and Figures 2 and 3). The adjusted R^2 (0.76) indicated a high level of association between the predictors ACSCA, SISCA, POSCA and their two-way interactions and the dependent variable NTSCA, meaning the values of each independent variable generally co-occurred with certain values of the dependent variable.

	<i>B</i>	<i>T</i>	<i>P</i>	LLCI	ULCI
Intercept	−1.466	−0.362	0.720	−9.743	6.811
Absorptive capacity–ACSCA (H1)	0.720	1.006	0.322	−0.741	2.180
Social Interaction–SISCA (H2)	−0.515	−1.287	0.208	−1.331	0.302
People-oriented culture–POSCA (H3)	1.408	0.893	0.125	−0.415	3.232
ACSCA × SISCA (H4a)	0.205	2.695	0.011	0.050	0.361
ACSCA × POSCA (H4b)	−0.206	−1.495	0.145	−0.487	0.075
SISCA × POSCA (H4c)	−0.076	−1.316	0.198	−0.195	0.042

Note(s): LLCI indicates the lower limits of confidence interval and ULCI indicates the upper limits of confidence interval

Table 2.
OLS regression
analysis test of
hypotheses

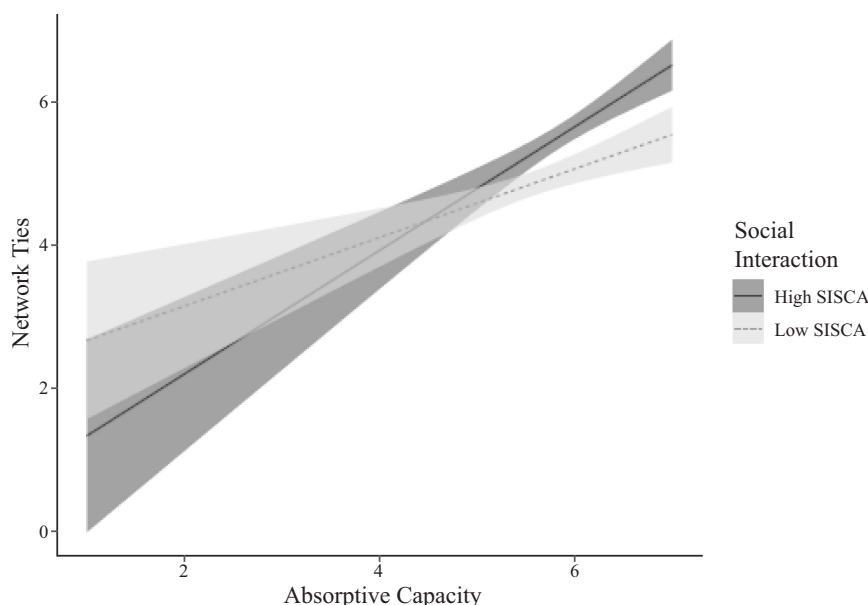
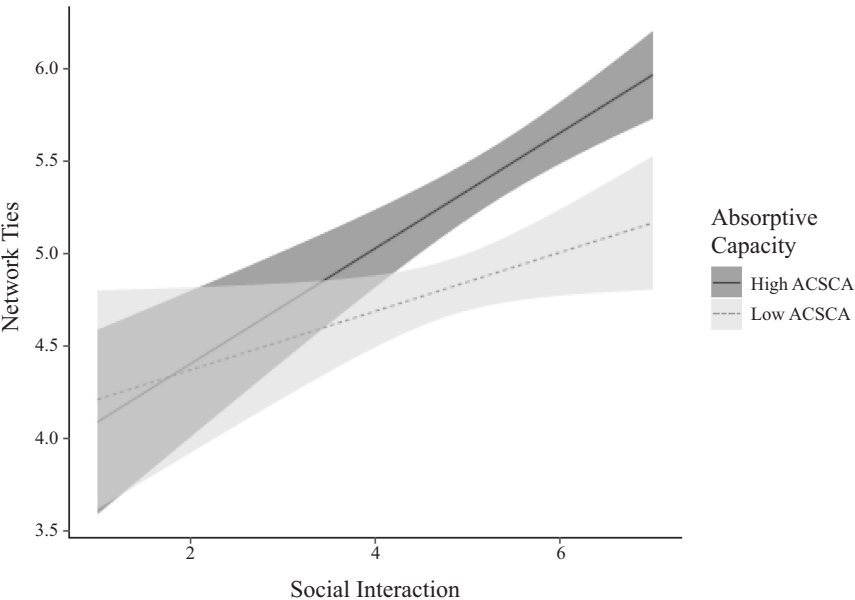


Figure 2.
Interaction plot
showing estimated
network ties (NTSCA)
based on absorptive
capacity (ACSCA) for
low and high levels of
social interaction
(SISCA) with 95%
confidence bands

Figure 3. Interaction plot showing estimated network ties (NTSCA) based on social interaction (SISCA) for low and high levels of absorptive capacity (ACSCA) with 95% confidence bands



There was a significant interaction effect between ACSCA and SISCA ($T = 2.695$, $p = 0.011$), suggesting moderation (see Table 2). No other regression coefficients were significant at the 0.05 level of significance. The presence of the interaction effect indicated the moderation of ACSCA with SISCA was not constant, meaning the effect differed at different values of the other. Simple slopes for ACSCA and SISCA were plotted using *R* at the first and third quartiles of the other variable to create interaction plots. Figure 2 is an interaction plot with estimated NTSCA (vertical axis) based on ACSCA for low and high levels of SISCA. There was a positive relationship between ACSCA and NTSCA at both low and high levels of SISCA, and the relationship between ACSCA and NTSCA was more positive at higher levels of SISCA. The increase in NTSCA for a one-unit increase in ACSCA was 0.48 ($T = 4.099$, $p < 0.001$) at the first quartile of SISCA (low SISCA, $Q1 = 4.12$) and 0.87 ($T = 6.423$, $p < 0.001$) at the third quartile of SISCA (high SISCA, $Q3 = 6.00$). Figure 3 is an interaction plot with estimated NTSCA (vertical axis) based on SISCA on NTSCA with different levels of ACSCA. Similarly, there was evidence of a positive relationship between SISCA and NTSCA at both low and high levels of ACSCA, and the relationship between SISCA and NTSCA became more positive at higher levels of ACSCA. The increase in NTSCA for a one-unit increase in SISCA was 0.16 ($T = 2.173$, $p = 0.038$) at the first quartile of ACSCA (low ACSCA, $Q1 = 5.25$) and 0.31 ($T = 5.834$, $p < 0.001$) at the third quartile of ACSCA (high ACSCA, $Q3 = 6.00$). In other words, the network ties score increased more for high social interaction for each one-unit change in absorptive capacity than for low social interaction. There was not sufficient evidence of an interaction between ACSCA and POSCA on NTSCA ($T = -1.495$, $p = 0.145$) or between SISCA and POSCA on NTSCA ($T = -1.316$, $p = 0.198$).

From the analysis of the interaction of ACSCA and SISCA, there was evidence of a positive relationship between ACSCA and NTSCA at both low and high levels of SISCA. Hypothesis 1 was therefore supported. Similarly, Hypothesis 2 was also supported as there was evidence of a positive relationship between SISCA and NTSCA at both low and high levels of ACSCA.

There was also evidence of strong positive correlations between NTSCA and both ACSCA and SISCAs, providing further support for [Hypotheses 1](#) and [2](#). There was no sufficient evidence of a main effect of POSCA or an interaction involving POSCA. [Hypothesis 3](#) was therefore not supported. There also was no sufficient evidence of a correlation between NTSCA and POSCA. [Hypotheses 4b](#) and [4c](#) were thus not supported in proposing the presence of an interaction. However, the interaction term for ACSCA and SISCAs was significant, providing support for [Hypotheses 4a](#).

Discussion and conclusions

The purpose of this research was to explore external firm ties and knowledge sharing providing insights for the reshoring and strengthening of small-sized firms involved in US apparel production. Following qualitative study of multiple firms involved in apparel production, we found many were challenged to learn more about the business of production and to make connections for accessing knowledge. In a follow-up quantitative study with this sample population, we examined the degree to which the firms use network ties, as external relationships, the amount of social capital embedded in those relationships in the form of social interaction and a people-oriented firm culture, and the ability of the firms to understand and incorporate knowledge, in the form of knowledge absorptive capacity.

Our quantitative results provide support for the knowledge-based view of the firm perspective in finding that external knowledge absorptive capacity holds a positive effect on network ties, and this relationship will be favored at both high and low levels of perceived social interaction. In addition, our study supports social capital theory in that social interaction across the supply chain has a positive effect on building network ties, at both low and high levels of knowledge absorptive capacity. There is also relevance for theory advancement and real-world application in that the relationships of absorptive capacity and social interaction with building network ties appear to be stronger or more positive when both knowledge absorptive capacity and social interactions are taking place at higher levels. Therefore, there is empirical support that a firm's ability to assimilate, accumulate and use external business knowledge and the firm's social interconnections across the supply chain work together, synergistically, to increase perceived network ties. Findings suggest that when examined together, the external linkages held more of an effect on network ties than did perceptions of internal or people-oriented culture existing within the firm.

The application of findings to apparel production in the USA suggests that, through development of network ties, the firms will build linkages for sharing knowledge and perhaps cooperative relationships for advancing production. Reshoring or backshoring to the USA will involve both location and make-or-buy decisions but holds increasing benefits in terms of delivering quick-turn production, high-quality fabrics and apparel and the level of control that retailers seek. Partial or full relocation of production from foreign countries to domestic locations will therefore require technological and people skills that could be supported through cooperation among several SME production firms either clustered in near proximity or connected through a supply chain system.

Limitations

A methodological limitation intrinsic to knowledge-based research is the difficulty of measurement. Cronbach's alpha for absorptive capacity was acceptable for exploratory research, but further work is needed to develop stronger reliability measures. Self-reported measures were also recognized as holding potential for bias. At the same time, we found

unavailability of other measures relative to the apparel industry. This was a small, exploratory study in one western US state. It is possible that our results generated from apparel producers may not hold in less technological environments or for significantly larger firms operating in other regions of the USA or in other global markets.

Implications and future research

Several other paths for future research of social capital theory and the knowledge-based view of the firm perspective among apparel producers are encouraged. Empirical validation is necessary with additional samples drawn from the national population of apparel producers. Further, the qualitative exploration of the lack of knowledge sharing discovered among firms in study 1 warrants further exploration (Jack, 2010). Though firms indicated a fairly high level of social interaction in study 2, the knowledge exchanged, according to the qualitative phase of the study, was perhaps more social than professional in content. The content of the information shared through social interaction thus deserves further study. As the majority of the firms indicated they were in the growth life cycle stage, perhaps this lack of sharing reflects Greve and Salaff's (2003) finding that the planning or an early stage was a period of greater knowledge sharing among all other phases. Findings do lend support to prior research by Larson (1992) in that the higher the level of social interaction, the stronger the level of information exchanged.

Further questions arise as to why the participants in the annual apparel summit events who were engaged in discussions of a cooperative nature did not develop stronger network ties that progressed to a collaborative stage advancing a cluster economy. Higher levels of open communication and cooperation are suggested, based on earlier work by Campaniaris *et al.* (2015), to be necessary for fortifying SME horizontal clustering. Additionally, further research is needed to examine levels of trust and reciprocity along the supply chain. In the quantitative study, we did not limit the respondents to addressing only the apparel summit event connections; thus, there are likely additional sources of knowledge sharing along the supply chain that justify further study. Continued mixed methods combining qualitative and quantitative approaches will provide pragmatic solutions to new and existing small business and entrepreneurial conditions.

Network research can also be directed toward understanding the type and effectiveness of networks in maturing or growth stage business operating in different social and economic climates. Longitudinal studies examining changes in the network ties are needed for network continuance (Jack, 2010). Extending the research to assess the relationship of network ties with small business innovation or performance also offers potential for analysis. Given the likely social and economic changes brought about in a post-coronavirus disease 2019 (COVID-19) environment, future studies may address questions concerning how networks develop or adapt to change when faced with challenging and opportune times.

In conclusion, this paper contributes to the knowledge-based view of the firm and social capital literature by assessing the relationships between knowledge absorptive capacity, social interaction, people-oriented culture and building network ties to highlight the perceptions of small-sized enterprises involved in apparel firm production. We contributed to this stream of research by finding empirical support for the role that knowledge absorptive capacity and social interactions may play in the building of network ties. The unique value in building of interorganizational relationships through network ties forms a competitive advantage that other companies cannot effectively replicate offering substantial strategy for launching or restoring firms involved in US apparel production. Broader outcomes from the research hold a twofold larger societal impact: job creation providing support and growth in the US sewn apparel and goods industry that will drive US economy. Buying US-made products will contribute to fair wages; reduce foreign dependency; raise quality, consumer protection and safety standards; reduce the carbon

footprint; stabilize the US economic system; reduce the trade deficit and sustain fair labor standards and child labor laws.

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