

The Link between Entry Learning, Growth Orientation, and Mode Choice in the Internationalization of Technology Firms

ABSTRACT

Drawing on learning theory, the present study examines the influence of different learning mechanisms on mode choice of young technology firms and how the relationships are moderated by the firm's growth orientation. Hypotheses are tested using a dataset of 197 German technology firms. The empirical results of ordinal logistic regressions illustrate that congenital learning (i.e. prior international experience), grafting (i.e. networks), and searching (i.e. market analysis) have a positive influence on the likelihood to choose an entry mode of high-level resource commitment. In contrast, vicarious learning (i.e. imitation) leads to a foreign entry mode choice with lower resource commitment. Moreover, we find that growth orientation strengthens these relationships in both ways. We contribute to the extant literature by forging a link between a) the learning mechanisms applied by young technology firms while venturing abroad for the first time and b) one of the most important characteristics of these firms, namely their growth orientation.

Keywords: Mode choice, entry learning, growth orientation, technology firms

INTRODUCTION

Mode choice has received considerable attention in internationalization literature. Canabal and White (2008: 267) found that “foreign market entry modes [...] represent the third most researched field in international management, behind foreign direct investment and internationalization.” Since the beginning of the 1980s many important theoretical and empirical contributions have been made to entry mode research (for qualitative reviews see e.g. Brouthers & Hennart, 2007; Canabal & White, 2008; Slangen & Hennart, 2007) (for quantitative meta-analyses see e.g. Morschett, Schramm-Klein, & Swoboda, 2010; Tihanyi, Griffith, & Russell, 2005; Zhao, Luo, & Suh, 2004). Theoretically, the entry mode literature is dominated by economic theories arguing that firms need to create a cost advantage in order to govern their foreign market activities most efficiently (e.g. Arregle, Hébert, & Beamish, 2006; Brouthers & Nakos, 2004). Other theories which have been frequently applied to study entry mode topics include the OLI framework, (e.g. Dunning, 1993), Internationalization Theory (e.g. Johanson & Vahlne, 1977), or the Resource-Based-View (e.g. Barney, 1991), but no name a few (for a comprehensive overview on theories dominating the field see e.g. Canabal & White, 2008).

Studies applying learning theoretical argumentations to explain foreign entry mode choice are limited. Given the importance of learning in the internationalization literature, the lack of learning argumentations is surprising. The few studies based on learning theory focus on large multinational enterprises (MNEs) (for an overview see e.g. Slangen & Hennart, 2007). These studies argue that large firms operating abroad in many different settings are exposed to a wide variety of events and ideas which may shape and strengthen the MNE’s knowledge leading them to choose higher-order modes (e.g. Barkema & Vermeulen, 1998). Cho & Padmanabhan (1995) pursue a similar line of reasoning arguing that MNEs operating in a variety of industries are likely to have learned more technological skills and, hence, prefer

higher-level mode choices over lower-level mode choices. Whereas applying a learning theoretical lens to study MNEs' mode choice adds particular value and new insights to the mostly economically driven entry mode literature, studies applying learning theoretical arguments for the mode choice of smaller firms or young technology firms respectively are largely missing to date.

However, learning is of particular importance for young technology firms venturing into foreign markets for the very first time (Schwens & Kabst, 2009). Opposed to large MNEs possessing a significant amount of resources and experience while taking entry mode decisions, young technology firms have been reported to suffer from liabilities of newness, size, and foreignness at their first internationalization (Hymer, 1960; Singh, Tucker, & House, 1986; Zaheer, 1995). In order to be able to amortize high initial R&D expenditures and to secure ongoing financing of R&D activities (Burgel & Murray, 2000), young technology firms are often strongly growth oriented and forced to venture abroad right from or shortly after firm inception (Oviatt & McDougall, 1994). Thus, opposed to large MNEs, technology firms have to take their initial entry mode decision on the basis of very limited experience and knowledge in a proactive and growth-oriented manner. Furthermore, if a young and inexperienced firm takes a "wrong" mode decision, this may seriously endanger further firm growth or even company survival (Sapienza, Autio, George, & Zahra, 2006). Thus, whereas for large MNEs the major interest lies in how learning processes impact mode decisions once the internationalization has been started, the critical question arising with regard to young technology firms' internationalization is how they are able to combine their growth oriented strategy with their entry learning activities in order to internationalize early and to choose the right initial entry mode decision.

The aim of the present paper is twofold: First, drawing on learning theory by Huber (1991), we study how congenital learning (prior international experience of the management),

vicarious learning (imitation), grafting (learning from networks), and searching (prior foreign market analysis) impact the first mode choice of young technology firms. Second, we investigate how the relationship between congenital learning, vicarious learning, grafting, and searching (independent variables) and mode choice (dependent variable) is influenced by the growth orientation (moderator) of the firm.

Our paper offers two major contributions to the extant literature: First, we study the entry learning behavior in the context of young technology firms and their first internationalization. Given that young firms do not have the time to prepare their first internationalization thoroughly and that a wrong entry mode decision can have serious consequences for a small firm suffering from liabilities of foreignness, size, and newness, it is critical to understand the knowledge basis on which these firms take their first mode choice. Drawing on learning theoretical argumentations by Huber (1991) allows us to differentiate between different types of learning (congenital learning, vicarious learning, grafting, and searching) and to study their influence on the firm's first mode choice. Hence, our study adds to previous knowledge by studying the knowledge sources of the initial entry mode decision of young technology firms. Second, investigating how growth orientation moderates the relationship between congenital learning, vicarious learning, grafting, and searching and first entry mode choice allows answering the question of how one of the most important firm characteristics of young technology firms – their growth ambitions – influences the entry learning behavior of the firm. Growth orientation has been shown to be a major motivation for young and small firms to internationalize (Nummela, Puumalainen, & Saarenketo, 2005; Tuppurä, Saarenketo, Puumalainen, Jantunen, & Kyläheiko, 2008) and to have an impact on the foreign market commitment (Acedo & Jones, 2007; Nummela et al., 2005). In this paper we forge a link between the firm's growth orientation and the sources of learning applied. We show that learning and growth orientation do not function independently, but we investigate

the interplay between these factors to gain a more idiosyncratic understanding of how entry learning unfolds in young technology firms (Casillas, Moreno, Acedo, Gallego, & Ramos, 2009; Kandaswami, 1998). Thus, our theoretical contribution is on the link between the international new venture and the learning theoretical literature.

The remainder of the paper is structured as follows: Next, we present our theoretical framework based on Huber (1991) and develop our hypotheses. We then test hypotheses on a dataset of 197 technology firms. Finally, we discuss our findings and address implications for managers and policy makers as well as limitations of our study.

THEORY AND HYPOTHESES DEVELOPMENT

Learning Theory

A large number of different theories have been used to study the entry mode decision of firms. Among the most frequently applied views are Transaction Cost Economics (TCE), the Resource-Based-View (RBV), Internationalization Theory, and Dunning's eclectic paradigm.

Of those, TCE is the most widely applied theoretical framework (Williamson, 1985). A major TCE argumentation is that under high levels of transaction specificity and uncertainty, firms tend to internalize their transactions using higher-order modes (Brouthers & Brouthers, 2003; Brouthers, Brouthers, & Werner, 2003; Erramilli & Rao, 1993). According to studies applying the RBV in entry mode research, firms apply a set of resources that are valuable, rare, and imperfectly imitable and exploit these resources in international markets in order to acquire or develop new resource-based advantages abroad (Luo, 2002; Tsang, 2000). For instance, Brouthers, Brouthers, and Werner (2008) studied how resource-based advantages influence mode choice under divergent levels of the institutional context of the host country. Chen and Chen (2003) examined the type of resources used in strategic alliances

and how these resources were shared between partners. The Internationalization Theory (e.g. Johanson & Vahlne, 1977, 1990, 2009) assumes firm internationalization to unfold in an incremental manner along the establishment chain with the following steps: 1) firms do not have regular exports, 2) firms export through agents, 3) firms sell through subsidiaries, and finally 4) firms begin overseas production. The key regulator behind the gradual increase in mode choice is that, over time, firms gain experience and therefore move from exporting to more complex mode types. As an example, Erramilli (1996) studied the influence of experience (length and scope) on mode choice on a sample of U.S. service firms. Finally, the OLI framework or Dunning's (1993) eclectic paradigm brings together concepts that earlier works have shown to influence the mode decision, namely ownership advantages, location advantages, and internalization advantages. For instance, Agarwal and Ramaswami (1992) found that all three advantages in terms of ownership, location, and internalization influence mode choice.

Most of these theories focused on explaining entry mode behavior of large MNEs. Studying small and medium sized enterprises (SMEs) or young technology firms respectively is largely underrepresented in the current discussion. This may be due to the fact, that the way the theories outlined above have been applied in previous studies does not actually address the relevant questions of young technology firms. For instance, studies drawing on TCE largely argued when uncertainty and specificity is high internalization of transactions through, for instance, wholly owned subsidiaries is likely. However, internalizing transactions with higher-order modes such as wholly owned subsidiaries is unlikely for young technology firms, which suffer from limited resources and financial restrictions not allowing to move internationalization forward with high investments. The dominating mode choices with regard to technology firms are non-equity modes such as exports or foreign distributors (Burgel & Murray, 2000). Hence, young technology firms are much more restricted with regard to their

entry mode and different research questions are of primary concern while studying young technology firms. As such, a major question arising is how young technology firms are able to learn about the foreign market in order to choose the optimal entry mode at their first internationalization. Drawing on the theories as outlined above would not allow for answering such research question. Hence, the present study draws on learning theoretical arguments by Huber (1991).

In his work, Huber (1991) examines four major constructs related to knowledge acquisition: congenital learning, vicarious learning, grafting, and searching.¹⁾ First, congenital learning relates to prior experiences of the organization's major decision maker. Huber (1991) argues that "organizations do not begin their lives with clean states. The individuals or organizations that create new organizations have knowledge about the new organization's initial environment [...] and they make this knowledge available to the new organization's members" (1991: 91). Huber (1991) highlights that especially the previous knowledge of the major decision maker is important for the firm's decisions and actions taken. Thus, congenital learning incorporates the relevant knowledge available through prior experiences made by the firm's major decision maker. Referred to our research context, congenital learning may include prior international experiences collected by the young technology firm's management. The rationale is that the management team's experiences made in foreign countries (e.g. by working in an internationally operating firm or in a multinational enterprise) may significantly influence the strategic internationalization decisions of the technology firm. Thus, congenital learning is one major source of knowledge acquisition which may influence the initial mode decision of young technology firms.

Second, vicarious learning refers to acquiring "second-hand experiences" (Huber, 1991: 96). Huber (1991) draws on earlier works by Eells and Nehemiks (1984) arguing that borrowing knowledge from other organizations is a major form of organizational learning.

According to Eells and Nehemiks (1984) this has been frequently observed in the automotive industry where companies routinely examined in detail other automotive firm's best practices and the way they appear in the marketplace. The idea behind vicarious learning is that rather than learning from own experiences in an experiential manner firms identify best practices in their environment and organize their own routines according to the routines of these benchmark firms (Schwens & Kabst, 2009). Thus, imitation of best practices is what best describes vicarious learning. Referred to our research context, technology firms identify firms which they perceive as best practices and imitate their routines of foreign market engagement. Such learning behavior reduces costs and possible sanctions of a variety of possible stakeholders (Meyer & Rowan, 1977; Scott, 1987).

Third, grafting is related to knowledge acquisition by acquiring and grafting on new members who possess knowledge not previously available within the organization. By the interaction with collaborators and enterprises, new knowledge that members of the own enterprise do not possess can be acquired. Referred to the internationalization of young technology firms, grafting is closely related to the use of network partners' knowledge in the internationalization of the firm. International network contacts have been shown to enable young and small firms access to foreign markets (Weerawardena, Mort, Liesch, & Knight, 2007) and to develop knowledge in trustworthy relationships (Yli-Renko, Autio, & Tontti, 2002). Moreover, researchers found that management teams with access to foreign market networks are better able to overcome the liabilities of foreignness (Schwens & Kabst, 2009) and to secure a firm's proprietary knowledge in foreign environments (Yli-Renko et al., 2002). Hence, grafting the knowledge of foreign market network partners is another form of foreign market knowledge acquisition which may impact the young technology firm's initial mode choice.

Fourth, searching (and noticing) is an important mechanism to acquire knowledge. Huber (1991: 97) describes this knowledge acquisition mechanism as “[...] search[ing] in a narrow segment of the organization’s [...] external environment, often in response to actual or suspected problems or opportunities.” Searching implies a systematic opportunity seeking approach to internationalization (Yip, Biscarri, & Monti, 2000) underlying formal strategic planning, opportunity seeking, and market research. Empirical evidence suggests that in particular newly internationalizing firms can make significant use of such a systematic approach to internationalization and through prior foreign market analyses (Yip et al., 2000). Through a planned approach to internationalization (Root, 1987) firms are able to systematically become familiar with the host country influencing mode choice. Hence, searching in the form of prior foreign market analysis is another important mechanism for young technology firms to collect the relevant knowledge to make their entry mode decision.

Hypotheses

Direct relationships

Congenital learning: We assume congenital learning to be positively related to higher-order initial mode choices at the first internationalization of technology firms. Prior international experience has already been shown to play an important role in the proactive and rapid internationalization of young firms (Oviatt & McDougall, 2005; Reuber & Fischer, 1997; Schwens & Kabst, 2009). Burgel and Murray (2000) have shown that prior international experience is positively related to international new venturing arguing that “managers who have lived abroad are more likely to sell internationally” (Burgel & Murray, 2000: 52). Prior international experience enhances the awareness of emergent opportunities (Westhead, Wright, & Ucbasaran, 2001), the pace of internationalization (Oviatt & McDougall, 2005; Zahra, Ireland, & Hitt, 2000), the degree of internationalization (Reuber &

Fischer, 1997), and export performance (Cavusgil & Zou, 1994; Kundu & Katz, 2003). Hence, young technology firms with prior international experience seem to be able to better deal with the liabilities of newness, size, and foreignness leading the technology firm to commit stronger to international markets.

As Fischer and Reuber (2003) notice, firms with management teams with prior international experience as opposed to those without international experience have strong abilities and skills concerning the management of internationalizing enterprises. Hence, they are sensitive towards international growth strategies, they detect market potentials earlier, and they know how to reduce uncertainties leading them to commit stronger to international markets by choosing higher initial entry modes (Oviatt & McDougall, 2005; Schwens & Kabst, 2009).

In line with these argumentations we assume a positive relationship between congenital learning and young technology firms' initial entry mode decision (Sanchez-Peinado, Pla-Barber, & Hébert, 2007; Shrader, Oviatt, & Phillips McDougall, 2000). In summary we hypothesize:

H 1: Congenital learning is positively related to the initial entry mode choice of young technology firms.

Vicarious learning: We assume vicarious learning to be positively related to higher-order mode choice at the first internationalization of technology firms. In order to overcome their liabilities of newness, size, and foreignness, young technology firms orientate themselves towards firms perceived as best practices in the foreign market and try to organize their own routines according to these benchmark firms thereby reducing liabilities (Schwens & Kabst, 2009). Referring to authors like Meyer and Rowan (1977) or Scott (1987),

organizations not only have to be efficient; they must also be legitimated. Legitimacy can be acquired by adopting structural elements that socially constructed environments regard as rational (DiMaggio & Powell, 1991; Haunschild & Miner, 1997; Haveman, 1993; Kraatz, 1998). Through mimetic isomorphism, young technology firms entering a foreign market tend to become similar to those organizations, reducing liability of foreignness and risk of foreign market entry (Scott & Meyer, 1992). Such a learning pattern is specifically catered to the dominant legitimized routines in the specific country market and reduces risks and frictions leading the firm to commit stronger to the focal market and to choose higher-order initial entry modes. Forsgren (2002: 264) supports this argumentation stating that “[. . .] by imitating other organizations with a high degree of legitimacy, the firm can reduce its perceived uncertainty about the foreign market without having to wait until its own market-specific knowledge has reached the required level. Internationalization itself can be seen as a legitimacy creating activity that will stimulate other firms to invest abroad much earlier than they would otherwise have done.” In addition to Forsgren’s argumentation we not only assume the firm to invest earlier but also higher with a stronger commitment. In summary we hypothesize:

H 2: Vicarious learning is positively related to the initial entry mode choice of young technology firms.

Grafting: We assume grafting to be positively related to higher-order mode choices at the first internationalization of technology firms. Not being able to learn experientially at their first internationalization due to time constraints, young technology firms have to rely on alternative governance structures to get access to the knowledge of others (Oviatt & McDougall, 1994; Schwens & Kabst, 2009). Grafting knowledge from networks provides

learning opportunities about foreign markets without necessarily gaining own experiential knowledge (Kale, Singh, & Perlmutter, 2000). “Firms can gain access to new knowledge bases created by other firms through partnerships and network relationships, without precisely having to go through all of their experiences“ (Saarenketo, Puumalainen, Kuivalainen, & Kyläheiko, 2004: 367). Thus, young technology firms may be able to substitute their lacking own knowledge by grafting the knowledge from others (Schwens & Kabst, 2009). This may be why networks have been shown to play an important role in the rapid internationalization of international new ventures (Coviello, 2006). Grafting knowledge from international network contacts can reduce uncertainty related to international commitment (Freeman, Edwards, & Schroder, 2006). Moreover, it facilitates foreign market entry by providing contact to potential customers or other stakeholders and by helping to spot opportunities for market development (Weerawardena et al., 2007). Forsgren (2002: 264) goes even further stating that “[m]arket-specific, tacit knowledge can be acquired through interaction with other organizations, which, in the context, also means that the prediction that internationalization is a slow process may not always hold true.” Grafting may allow for an internationalization pattern not necessarily in line with traditional internationalization theories assuming market entry to unfold in an incremental manner.

Thus, we assume that grafting allows young technology firms to substitute lacking own knowledge and experience by the experience and knowledge of others allowing them to take initial mode decisions with a higher commitment than exports. Grafting knowledge offers young technology firms the opportunity to overcome their resource constraints and reduce liabilities allowing them to commit stronger to international markets. In summary we hypothesize:

H 3: Grafting is positively related to the initial entry mode choice of young technology firms.

Searching: We assume searching to be positively related to higher-order mode choices at the first internationalization of technology firms. Prior foreign market analyses have been shown to constitute a major mechanism to acquire knowledge before firms internationalize (Pedersen & Petersen, 2004). Searching implies a systematic opportunity seeking approach to internationalization (Yip et al., 2000) underlying formal strategic planning, opportunity seeking, and market research. Empirical evidence suggests that in particular newly internationalizing firms can make significant use of such a systematic approach to internationalization (Schwens & Kabst, 2010). Providing a 10 step road map to success in foreign markets, Miller (1993) also gives some insights for the analysis of relevant market information before firms venture abroad. Through a systematic information collecting approach, young technology firms are able to systematically become familiar with the host country, despite limited managerial capacities. Firms conducting market analyses before they internationalize, possess a greater knowledge about legal, political, and economic conditions. Developing a better understanding of norms and values dominant in the target country (Pedersen & Petersen, 2004) allows young technology firms to better deal with the prerequisites of the host country. Such increased familiarity with the host country conditions allows young technology firms to commit stronger to their first international market, despite their lacking experience and resources. Therefore, we hypothesize:

H 4: Searching is positively related to the initial entry mode choice of young technology firms.

Moderating effects

We assume the relationship between congenital learning, vicarious learning, grafting, and searching and entry mode choice of technology firms to be moderated by the firm's growth orientation. The pivotal role of growth orientation in the rapid and proactive internationalization of young firms has often been asserted in prior research (Acedo & Jones, 2007; Coviello & McAuley, 1999; Dimitratos & Jones, 2005; Gilbert, McDougall, & Audretsch, 2006; Nummela, Saarenketo, & Puumalainen, 2004). Research shows that besides capabilities, attitudes such as proactivity are essential for the internationalization strategy of the firm (Chetty & Campbell-Hunt, 2004; Oviatt & McDougall, 1995). Young technology firms possess a distinctive and proactive growth orientation to spot windows of opportunity on a global scale (Knight & Cavusgil, 1996). Madsen and Servais (1997) support this assumption towards internationalization by stating that international new ventures see opportunities rather than obstacles in international markets. A proactive attitude towards internationalization is reflected in growth seeking behavior (Covin, Slevin, & Covin, 1990) which leads to earlier internationalization (Autio, Sapienza, & Almeida, 2000), higher levels of foreign sales, and a larger commitment to foreign markets (Shrader et al., 2000).

Thus, based on these argumentations we assume that the learning mechanisms are used more effectively for foreign market entry if there is a strong connection to the growth orientation of the firm (Casillas et al., 2009; Kandasaami, 1998). If the firm has no intention for growth, learning conditions about the foreign market become less important, because growth will not take place. A strong growth orientation leads to a better recognition and realization of the international opportunities with a high degree of resource commitment and stronger interest in international expansion (Shrader et al., 2000). Because of openness towards international growth a larger commitment to foreign markets can be achieved (Jantunen, Nummela, Puumalainen, & Saarenketo, 2008). Thus, in summary we argue that growth orientation influences the way congenital learning, vicarious learning, grafting, and

searching influence young technology firm's initial entry mode decision. Therefore, we hypothesize:

H 5a: The relationship between congenital learning and the initial entry mode choice of young technology firms becomes stronger under high levels of growth orientation of the firm.

H 5b: The relationship between vicarious learning and the initial entry mode choice of young technology firms becomes stronger under high levels of growth orientation of the firm.

H 5c: The relationship between grafting and the initial entry mode choice of young technology firms becomes stronger under high levels of growth orientation of the firm.

H 5d: The relationship between searching and the initial entry mode choice of young technology firms becomes stronger under high levels of growth orientation of the firm.

In summary, Figure 1 illustrates the study's underlying research model.

 Insert Figure 1 around here

METHODOLOGY

Data

We test our hypotheses on a dataset of German firms from four different technology areas: nanotechnology, biotechnology, microsystems, and renewable energies. We collected data from multiple sources to establish the validity of our measures and reduce common method variance. First, we used secondary data to identify the relevant firms from the four technology areas. In close cooperation with industry experts from the Association of German Engineers (VDI) (for the populations of nanotechnology, biotechnology, and microsystems) and industry experts from the German Energy Agency (for the renewable energy population), we identified a sample with a total number of 1,944 firms. We used different databases

(“Hoppenstedt” and “The Creditreform Markus Database”) to gather quantitative firm information such as the number of employees or the year of foundation of the relevant firms. Moreover, we used the “Factiva” database to gain qualitative information about, for example, the internationalization actions taken by the firms. Furthermore, in line with Cloninger and Oviatt (2007), we checked every firm’s website to verify the secondary data.

Second, we conducted twelve informant interviews (with three firms from each technology area) as input for our questionnaire construction. Third, we tested the questionnaire on another twelve representative firms (again, three firms from each technology area) prior to the survey.

We collected the primary data of our study in 2007. To limit common method bias, we sent questionnaires to collect data of the independent, dependent, and moderator variables to two informants in each firm. The first questionnaire was sent to the firm’s CEO as he is perceived to have the most profound knowledge of the firm strategy as well as internationalization decisions taken by the firm. The second questionnaire – depending on the firm’s organizational structure – was sent to an informant with expert knowledge of the internationalization of the firm such as the head of strategy, sales, or export. To maximize our response rate, we undertook several measures as suggested by Dillmann (2000). Firms received a letter stating the purpose and importance of the research project and subsequently a phone call in which they were requested to participate. We received 335 questionnaires (17.2%) of which 44 firms had two respondents. As we surveyed the total populations of German nanotechnology, biotechnology, microsystems, and renewable energy firms, our sample included both international firms and firms with activities exclusively in the domestic market. Our final sample includes $n=248$ firms with international activities and $n=87$ firms with explicit activities only in the domestic market. This is a percentage of 74% internationally acting and 26% domestically acting firms which is consistent with the

secondary information that we collected in databases and on the firms' websites prior to the questionnaire-based survey.

Of the 248 international firms 22 informants did not provide the necessary information regarding their first international mode choice. Of the remaining 226 firms with international activities, 107 firms used exports as first foreign market entry mode, 57 firms used contractual co-operations, and 33 firms foreign distributors as initial foreign entry mode. Higher-order mode choices such as wholly-owned subsidiaries or equity joint ventures are quite rare in our dataset. As such, only 9 firms used foreign sales subsidiaries as initial mode choice, 7 firms applied long-term contracts, another 7 firms used foreign subsidiaries with production as their first internationalization mode, and only 6 firms were engaged in an international joint venture at their first internationalization. As exports, contractual co-operations, and foreign distributors are the most frequently used mode types we only included firms which chose one of the three entry mode types into our final dataset. Such a procedure is in line with earlier studies on international mode choice of young technology firms. For example, Burgel and Murray (2000) only considered firms with export activities or foreign distributors in their analyses although a minority of firms used higher-order mode choices. Thus, the nature of our sample with regard to first foreign market entry mode seems to be in line with previous studies in this area. The final dataset, hence, covers 197 firms with exports, contractual co-operation, and foreign distributor as initial mode choice. Descriptive statistics show that the firms included in our final data were on average 11.4 years old and realized 39% of their total turnovers overseas serving on average 10 foreign countries. The firms conducted their first internationalization after 3.7 years on average, whereas 68% of the enterprises even internationalized within the first three years.

To test for non-response bias, we followed Armstrong and Overton (1977), examining differences between respondents and non-respondents, and compared early and late

respondents in terms of the four variables congenital learning, vicarious learning, grafting, and searching. A t-test showed no significant differences for all three variables. Thus, results do not indicate problems of nonresponse bias. Furthermore, we used the secondary data we collected prior to the survey and conducted a Kolmogorov-Smirnov two-sample test according to Siegel and Castellan (1988) in order to assess possible differences between the responding firms and the firms in the whole sample. We compared between true respondents and true nonrespondents for the number of employees and firm age. The test yielded no significant results for number of employees ($p=0.34$) and firm age ($p=0.26$) showing that nonresponse bias is not a problem for our analyses.

We collected retrospective data of our dependent, independent, control, and moderator variables. In organizational research, retrospective reports have been used extensively to study strategic decision making processes (Bourgeois & Eisenhardt, 1988; Mintzberg, Raisinghani, & Thoret, 1976). “The primary challenge with retrospective data collection is that key informants may not be able to accurately recall the past. As Golden (1992), Huber and Power (1985), Wolfe and Jackson (1987) and many others have suggested, inaccurate recall in retrospective reporting can result from inappropriate rationalization, oversimplifications, faulty post hoc attributions, and simple lapses of memory” (Miller, Cardinal, & Glick, 1997: 189). Asking the firms in our dataset for information about knowledge and internationalization activities may be a problem due to the age of some of the companies. However, descriptive statistics reveal that the vast majority of the technology firms in our sample conducted their internationalization activities in the last few years. This may reduce the risk of informant fallibility significantly (Golden, 1992; Miller et al., 1997) and lead to higher retrospective accuracy of our data. Additionally, most of the firms in our sample are family businesses and founder managed. As we addressed the questionnaire to the top management, the likelihood of the CEO being involved in the first internationalization

decision making processes is high. Particularly in family businesses, the CEO is often closely related to the founder of the firm or established the company himself. This may reduce the risk of informant fallibility (Golden, 1992; Miller et al., 1997) and lead to higher retrospective accuracy. Furthermore, Miller et al. (1997) suggest in their analysis of both retrospective and non-retrospective strategy data that CEO reliability is no lower in retrospective than in non-retrospective reports. To further assess reliability and validity of our data, we assessed the interrater reliabilities for the 44 firms in which we obtained data from two respondents. Intraclass correlation coefficients (ICC) for our scales exhibited high interrater reliability (Fleiss & Shrout, 1977), all at the .000 level: for instance, vicarious learning (ICC=.76) and searching (ICC=.71).

Measurement

We adapted the variables in our model from established items in the entrepreneurship, international business, and management literature. Whenever possible, we used multiple-item operationalizations to minimize measurement error and to enhance the content coverage for the constructs in our model. We measured statement-style items on 5-point Likert-scales. We asked respondents to answer the questions related to their first international engagement.

We measured the dependent variable “mode choice” by asking about the mode chosen for the firm’s first internationalization. The respondents had the choice between exports, contractual co-operations, foreign distributor, long-term contract, international joint venture, foreign sales subsidiary, and foreign subsidiary (including production). Due to the responses of the firms in our sample, we were only able to consider exports, contractual co-operations, and foreign distributor to measure our dependent variable. These mode choices were the most frequently chosen types of initial entry mode, which is in line with earlier studies on the internationalization of technology firms and it best reflects the internationalization behavior of

young technology firms (Burgel & Murray, 2000). Following earlier studies (Bruneel, Yli-Renko, & Clarysse, 2010; Burgel & Murray, 2000), we constructed an ordinal variable consisting of “exports” (coded = 1), “foreign distributor” (coded = 2), and “contractual co-operation” (coded = 3) to measure our dependent variable.

We measured our first independent variable “congenital learning” by the prior international experience of the management team. We adapted our measurement from Reuber and Fischer (1997), and defined congenital learning as whether a member of the top management had a) worked in an internationally operating company and/or b) worked abroad. Binary coding was applied, as “the relationship between international experience and organizational outcomes is unlikely to be linear across time or across individuals and strategic management literature suggests that exposure to a particular type of experience, regardless of its length, is likely to be consequential” (Reuber & Fischer, 1997: 816).

We measured “vicarious learning” by a three-item scale (ranging from 1 = “low extent” to 5 = “high extent”). Adapted from Haunschild (1993) and Schwens and Kabst (2009), we asked respondents about the extent to which their firm had tracked the actions of their major competitors, analyzed their competitor’s products and brands, and had an orientation towards firms perceived as best practices in the host country prior to venturing abroad for the first time. The items load on one factor and the construct shows good reliability (Cronbach’s $\alpha=.904$).

We measured “grafting” by a four-item scale (ranging from 1 = “low extent” to 5 = “high extent”) adapted from Ellis and Pecotich (2001) and Schwens and Kabst (2009). We asked the firms about the extent to which they interacted with customers, competitors, suppliers, and other co-operation partners prior to venturing abroad. The items load on one factor and the construct showed good reliability (Cronbach’s $\alpha=.855$).

We measured the variable “searching” by a three-item scale adapted from Yli-Renko and colleagues (2002). On a five-point likert scale (ranging from 1 = “low extent” to 5 = “high extent”), we asked our respondents about the extent to which the firm 1) had conducted analysis of the foreign market situation, 2) had conducted site analysis, and 3) had collected general information about the foreign market prior to entering the market. The three items load on one factor and the variable showed good reliability (Cronbach’s $\alpha=.893$).

We measured the moderator variable “growth orientation” by a three-item scale. Following Autio et al. (2000), Yli-Renko et al. (2002), and Cavusgil (1984), we asked respondents in how far they concur with the following statements (1=“strongly disagree” to 5=“strongly agree”): “we have to grow in order to succeed in the future”, “our firm aims can be achieved mainly through further growth”, and “the markets we are currently serving still offer sufficient growth potential” (recoded). The three items load on one factor and show good reliability (Cronbach’s $\alpha = 0.744$).

We included several control variables into our model. We controlled for “firm size” by taking in the (log) number of employees of the firm at the timing of first foreign market venturing. Firm size is often considered as a proxy for resources availability which is an important issue when it comes to the internationalization in particular of technology firms. Moreover, we controlled for the different motives the firms had for their internationalization. The impact and structure of motives is supposed to play a major role for firm internationalization (e.g. Tatoglu, Demirbag, & Kaplan, 2003; Williams, 1992). Many discussions in the field of international entrepreneurship circle around the issue that early internationalizers pursue a proactive approach to venture abroad. Therefore, we included “access to customers” and “access to knowledge” as control variables to find out to what extent the internationalization decision was proactively motivated. Finally, we controlled for the cultural distance between the firms’ domestic market (Germany) and the first host country

market targeted by the firm. The initial mode decision and the learning mechanisms applied may significantly depend on the distance between the domestic and the foreign market as uncertainties may increase with a larger distance. Following Kogut and Singh (1988) we constructed an index of the cultural distance using the cultural dimensions of the Globe study (e.g. House, Hanges, Javidian, Dorfman, & Gupta, 2004).

Assessing common method variance

As the dependent, independent, and moderator variables come from an identical source, there could be a problem of common method variance (CMV). However, in the present study we do not believe CMV to be a problem for at least the following four reasons.

First, following Podsakoff and Organ (1986), we used the Harman's one-factor test to assess the influence of common method bias. Principle component factor analysis based on the dependent, independent, and control variables of our model revealed three factors with an eigenvalue greater than 1. These three factors accounted for 50.3% of the total variance (factor 1: 24%, factor 2: 14.5%, factor 3: 11.8%). Thus, no single factor emerged, nor did one factor account for most of the variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Podsakoff & Organ, 1986). Second, our dependent variable mode choice is not the kind that would create bias (because it is an objective measure rather than a perception) (Brouthers & Brouthers, 2003). Third, we included interaction terms in our modelling which "is likely to reduce CMV because such a complex relationship is, in all likelihood, not part of the respondents' theory in use" (Chang, Witteloostuijn, & Eden, 2010: 180). Fourth, we checked the firm's website information, brochures, and other available firm information (Cloninger & Oviatt, 2007) to verify the information from our survey. We used available secondary information (number of employees worldwide and year of company foundation) and performed paired-sample t-tests to identify differences in means between our survey and secondary data.

Results

Table 1 reports means, standard deviations, and zero-order correlations among the dependent, independent, moderator, and control variables. No correlation among the variables exceeds 0.7, showing no serious risk for multicollinearity (Anderson, Sweeney, & Williams, 1996). To further test for multicollinearity, we calculated the variance inflation factor (VIF); however, we did not find significant problems for multicollinearity (all VIF values are < 1.5), since all values stayed below 2.5 (Allison, 1999).

 Insert Table 1 around here

To test our hypotheses, we used ordered logistic regression analysis. When conducting an ordered logistic regression it is presumed that the effects of the predictor variables are the same for all categories of the dependent variable. Hence, as a model premise we tested the parallel line assumption showing no significant violation of the assumption (Garson, 2009; Orme & Combs-Orme, 2009).

The application of interaction terms in logistic regression models requires explanation. There has been an ongoing debate in the literature about the difficulties in applying this methodology (Li & Meyer, 2009; Powers, 2005; Shaver, 2005). Just recently, Hoetker (2007) commented critically on the use of logit and probit models in strategic management research, stating that interaction effects are complicated to compute and interpret in non-linear models (Norton, Wang, & Ai, 2004). Interaction effects cannot simply be interpreted by looking at the sign, magnitude, or statistical significance of the coefficient on the interaction term when the model is nonlinear. We computed and interpreted the interaction effects in our models according to Ai and Norton (2003) and Jaccard (2001). We computed the correct marginal effect of a change in the interacted variables in our logit model and identified the correct

standard errors by applying commands suggested by Norton, Wang, and Ai (2004). Due to the scales of the moderator variable “growth orientation”, subgroup analysis was not applicable (MacCallum, Zhang, Preacher, & Rucker, 2002; Maxwell & Delaney, 1993).

We set up eight different models to display our results. As proposed by Aiken and West (1991), establishing different models allows for a comparison between alternative models with or without interaction terms by showing changes in R^2 (Nagelkerke) and, therefore, delivers an indicator for the explanatory power of the moderator effects. To analyze the hypothesized moderator effects, we mean-centered the variables before creating interaction terms in order to avoid multicollinearity (Aiken & West, 1991). Moreover, In order to better interpret the interaction terms, we followed Jaccard (2001) and Hoetker (2007) and supplemented the numerical information with plots of the predicted log odds. “A graphical presentation provides the reader with the most complete understanding of interaction’s effect” and gives assistance to interpret the complex associations related with interactions in logit models (Hoetker, 2007: 337). As suggested by Jaccard (2001), we selected a low, medium, and high score of the moderator variable to illustrate the curves. The low level condition was defined as a standard deviation below the mean of the moderator, the medium level condition was defined as the mean, and the high level condition as a standard deviation above the mean of the moderator (Jaccard, 2001).

In model 1, we entered the control variables only. Model 2 implies the control variables and the independent variables. Model 3 additionally contains the moderator variable “growth orientation”. In models 4 to 7, we included the interaction terms separately, whereas the final model 8 includes all control, independent, moderator, and interaction variables. We applied a significance level of 10 %, as detecting interaction effects with a regression analysis is rather difficult in field studies (McClelland & Judd, 1993). Table 2 presents the results of the regression analysis.

Insert Table 2 around here

Looking at the control variables (model 1) we find a significant relationship between the motive “access to knowledge” and “mode choice”. Furthermore, we find a significant association between “cultural distance” and “mode choice”. These two associations underpin the assumption that the two variables play a major role in the initial mode choice of young technology firms.

Model 2 shows the direct effects of the knowledge acquisition variables. Hypothesis 1 assumes a positive relationship between “congenital learning” and “mode choice”. Our results show that congenital learning is positively related to entry mode choice supporting our assumptions from hypothesis 1. We do not find support for hypothesis 2 assuming a positive relationship between vicarious learning and mode choice. Although significant, the relationship is in the opposite direction. It seems that rather than focusing on best practices, vicarious learning focuses on the entry mode type most frequently applied in the host country market. Hypothesis 3 proposes a significant positive relationship between “grafting” and mode choice. Our data strongly support this effect. Moreover, “searching” is positively related to entry mode choice supporting hypothesis 4. Similar to prior international experience, the systematic collection of market information allows young firms constrained in their resource endowment to commit stronger to their first foreign market.

Model 3 illustrates the direct effect of “growth orientation”. The empirical results emphasize that an international growth orientation does not have a direct effect on mode choice. As we assumed growth orientation to moderate the relationship between congenital learning, vicarious learning, grafting, searching, and initial mode choice of young technology firms, we calculated and included interaction terms. The final model 8 includes all control,

independent, moderator, and interaction terms and is highly significant. Model 8 explains 42.4% of the total variance (Nagelkerke).

Hypothesis 5a assuming that the relationship between congenital learning and mode choice becomes stronger under high levels of growth orientation is supported by our results both in model 4 and the final model 8. Figure 2 presents the plots of the predicted log odds for the interaction of congenital learning and growth orientation. In case of a high score of growth orientation the predicted log odds of the mode choice increases even more than at medium or low levels of growth orientation. An increase of congenital learning in combination with a high-level growth orientation leads to stronger foreign market commitment in terms of entry mode.

 Insert Figure 2 around here

In hypothesis 5b we assumed the relationship between vicarious learning and mode choice to be moderated by growth orientation. We do only find partial empirical support for this relationship. Whereas in the final model 8 the moderator is significant (although in the opposite direction), entering the interaction term separately does not yield significant results. Due to the conflicting findings we restrain from plotting the interaction terms. We do not find support for our hypothesis 5c assuming the relationship between grafting and mode choice to be moderated by growth orientation. The interaction is neither significant in model 8 including all interaction terms, nor when entered individually in model 6. Finally, we find partial support for our hypothesis 5d assuming the relationship between searching and mode choice to be moderated by growth orientation. The interaction term is significant when entered in the final model 8 including all interaction terms. However, if the interaction term is entered individually (model 7), we do not find empirical support for our assumptions. We, therefore, restrain from plotting this interaction term.

DISCUSSION

Although mode choice is a very important topic in international business research, empirical studies applying learning theory are limited. For young technology firms – often venturing into foreign markets early and rapidly under high resource constraints and limited experience – a critical question is how they are able to balance their learning activities and the growth oriented approach they mostly pursue. To address this research question, we developed a research design forging a link between learning theoretical argumentations (Huber, 1991) and the growth orientation literature on international new ventures (Nummela et al., 2005; Tuppurä et al., 2008).

Our results provide strong empirical support for our framework. We show that congenital learning is an important determinant for the entry mode choice of technology firms. This finding adds to previous results as the role of congenital learning has been discussed quite contradictory in earlier research. Whereas some authors argued and empirically showed that prior international experience enables the firm to deal with liabilities of foreignness fostering proactive firm internationalization (Reuber & Fischer, 1997), others argued that prior experience can be misapplied. According to the latter stream of research experience from previous internationalization efforts can be generalized and falsely applied and, thus, have a negative impact on the firm's foreign market venturing (e.g. Halebian & Finkelstein, 1999). Our study helps resolving the contradictory findings and shows that for technology firms venturing abroad for the first time, congenital learning plays an important role to reduce uncertainties and liabilities related to firm internationalization.

Opposed to our theoretical assumptions, the relationship between vicarious learning and entry mode choice is significant, but in the opposite direction. It seems that vicarious learning does not represent an orientation towards best practices, but an orientation towards

choosing the same entry mode as the majority of firms entering the focal market does. To explain this finding we draw on new institutionalism. Because of mimetic isomorphism young resource-constraint firms tend to become similar to organizations already active on the market and “once enough social actors do things a certain way, that particular course of action becomes taken for granted or institutionalized, and thereafter, other social actors will undertake that course of action without thinking” (Haveman, 1993: 595). Forsgren states that “firms sometimes ‘follow the herd’ when they invest abroad, or learn through the imitation of other organizations” (Forsgren, 2002: 274). In addition, Lu found support for later entrants following entry mode patterns established by earlier entrants (Lu, 2002). Vicarious learning as a phenomenon of “following the herd” and imitating established structures can lead to the choice of export as first foreign entry mode. Young technology firms seem to strive for legitimacy in the focal market leading them to imitate the routines which most frequently dominate.

The empirical findings support our theoretical assumptions regarding the positive influence of grafting on mode choice. Thus, we contribute to the literature which focuses on the knowledge acquisition and learning from external sources (e.g. Schwens & Kabst, 2009). Previous research has shown that grafting knowledge from others enables young and small firms the access to foreign markets (Weerawardena et al., 2007) and to develop knowledge in trustworthy relationships (Yli-Renko et al., 2002). Our findings support the assumption that grafting knowledge from external sources allows young and internationally operating firms to compensate their liabilities of newness, size, and foreignness. Moreover, our research helps to countervail recent studies arguing that networks have a liability side as well (Chetty & Agndal, 2007). For instance, Woolcock & Narayan (2000) and Chetty and Agndale (2007) incorporate both the benefits and the costs of social capital in their research. According to this literature large networks may cause liabilities for internationalizing firms, because they are

harder to control and increase the risk of opportunistic behavior and unintended knowledge diffusion. Our findings illustrate that the benefits of grafting seem to outweigh its disadvantages and, hence, contribute to resolving the contradictory discussion currently holding back the field.

With regard to the influence of searching on young technology firms' mode choice, our research adds to previous research on systematic international market selection (Brouthers & Nakos, 2005). Drawing on learning theory allows incorporating the concept of searching explicitly into our research demonstrating that searching is an important source of knowledge acquisition although widely neglected in previous research (Brouthers & Nakos, 2005). Our paper shows that congenital learning, vicarious learning, grafting, and searching play an important role in the internationalization and mode choice of technology firms. Thus, we offer an important contribution in this regard.

Regarding the interactive effects of growth orientation, our research provides more idiosyncratic findings on the interplay between different sources of knowledge acquisition and one of the most important constructs in international entrepreneurship research – the firm's growth orientation. We find that particularly the influence of congenital learning becomes significantly stronger under conditions of high growth orientation of the firm. Prior knowledge of key decision makers of technology has a particular influence on higher-order mode choices when the firm is growth oriented. This is an important finding allying the individual level characteristics with strategy constructs. Future research may want to pay particular attention to this intersectional effect.

Further, our results suggest that growth orientation is an important moderator influencing the entry learning behavior of young technology firms. As the interaction effects of vicarious learning, searching, and growth orientation offer significant results only in the final model 8, we calculated a three-way interaction in order to proof a possible joint effect

between the three variables. The three-way interaction term is significant at the 10% level ($\chi^2=66.427$, $p=.000$, R^2 (Cox & Snell)=.330, R^2 (Nagelkerke)=.380). Results show a negative relationship between the three-way interaction and the choice of foreign market entry mode (-.235†). To gain further understanding of this relationship we plotted the three-way interaction according to Dawson and Richter (2006). Figure 3 presents the plot of the predicted log odds of the three-way interaction. Under the condition of high versus low growth orientation different joint effects of vicarious learning and searching can be shown. The three joint effects (1), (2), and (4) lead to a decrease of the predicted log odds of mode choice. In contrast, the joint effect of low vicarious learning and high searching (3) leads to an increase of the predicted log odds based on high growth orientation. In cases where little imitation is combined with a high amount of searching for information about the foreign market there is a stronger foreign market commitment in terms of entry mode when the firm is growth oriented. We have to note that we have a situation in which the three-way interaction is significant but the slope differences are not significant. According to Dawson and Richter (2006) the interpretation of the three-way interaction may be restricted as “the significance of the three-way interaction is a function of a complex interaction of more than one pair of slopes rather than a single pair of slopes” (Dawson & Richter, 2006: 925).

 Insert Figure 3 around here

LIMITATIONS AND IMPLICATIONS FOR RESEARCH, MANAGEMENT, AND POLICY MAKERS

Our study had to major research aims: First, we aimed at providing theoretical as well as empirical evidence on the entry learning behavior of young technology firms at their first

internationalization. Second, we investigated how the firm's growth orientation moderates the relationship between the types of knowledge acquisition and mode choice. Our paper provided strong support for the learning theoretical framework to analyze how young technology firms learn in order to enter foreign markets in a growth oriented manner.

As is the case for most empirical studies, our paper faces several limitations. First, our study is limited to technology firms not allowing us to generalize our findings towards more traditional industries such as manufacturing or service firms. As our framework has proven worthwhile to study the entry learning behavior of technology firms, future research may want to draw on our theoretical concept and transfer the knowledge to other industries and sectors. Technology firms differ in their internationalization behavior from more traditional firms (Oviatt & McDougall, 1994) and, hence, more in-depth knowledge regarding the entry learning in sectors other than technology intensive industries is a worthwhile endeavor.

Second, our analyses draw on cross-sectional data not allowing to analyze developments over time and changes in the knowledge acquisition behavior of the firms. For future research it is important to identify how learning processes change over time in order to provide pre-entry and post-entry evidence and to combine this knowledge. To date, entry mode literature is largely limited in terms of longitudinal studies investigating changes over time.

The measurement of our dependent variable is restricted and includes non-equity based entry modes only. Although this may be a limitation of our study, the nature of our dependent variable is in line with previous studies focusing on the entry mode choice of technology firms (e.g. Burgel & Murray, 2000). Testing the association of the types of learning with equity and non-equity modes of entry is an interesting area for future research. However, given that the initial entry mode choice of technology firms is largely restricted to non-equity modes, studies pursuing this research aim may want to draw on more traditional

industries such as manufacturing taking higher-order initial mode choices than technology firms.

Based on the empirical results, we can derive implications for management and policy makers. As our results show, it is important for managers to take into consideration to what extent a resource commitment of venturing abroad is desired. If a high resource commitment is of peculiar interest, the management will have to focus on pre-entry learning to gain knowledge about the foreign market. Foreign market knowledge will act as an enabler of a foreign market entry of high resource commitment. Before venturing abroad firms have different possibilities to acquire knowledge about the foreign market. For a young and resource-constraint technology firm it is an important option to learn about the foreign market by recruiting managers with prior international experience. Moreover, grafting and the interaction with customers, competitors, suppliers, and other co-operation partners of managers are of relevance. Another enabler prior to the entering of the foreign market is the collection of general and specific information about the foreign market. In order to restrict the probability of failure, managers should spend resources on knowledge acquisition prior to foreign market entry.

Concerning policy makers a pivotal implication of internationalization studies is the need for supporting firms to target opportunities of internationalization at a very early stage. It is challenging to access the essential knowledge to identify foreign market opportunities (Cumming, Sapienza, Siegel, & Wright, 2009). Young and resource constraint firms may not be able to detect these foreign market opportunities on their own because of lacking knowledge. As our empirical results show, the discussed types of learning enable the internationalization of firms in terms of foreign market choice. Therefore, policy support may aim at supporting the acquisition of knowledge about the foreign market in order to identify the market opportunities. Policy support may target at qualifying skills to detect market

opportunities as well as establishing and developing networks in order to gain the requisite expertise (Cumming et al., 2009). However, not all internationalizing firms are intended for global operations. We can find a wide range of firms internationalizing. This range spans firms that are able to internationalize right from inception as well as firms that are not able to internationalize at all. The support offered by policy makers may differ according to the differing potentials of firms depending on the circumstances and the context of the firms (Wright, Westhead, & Ucbasaran, 2007). Hence, “policy might be aimed at promoting new ventures with rapid international growth potential” (Cumming et al., 2009).

Notes

¹⁾ Originally, Huber (1991) distinguishes a fifth knowledge acquisition dimension: experiential learning. Experiential learning takes place post-entry, after the initial foreign market mode decision has already been taken. This paper examines entry learning prior to first internationalization. Hence, the firm is not able to learn experientially pre-entry, but needs to acquire knowledge through different learning mechanisms. Post-entry learning through own experiences is not the focus of this paper and we therefore do not incorporate Huber's (1991) fifth dimension of experiential learning into consideration.

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Figure 1: Research model

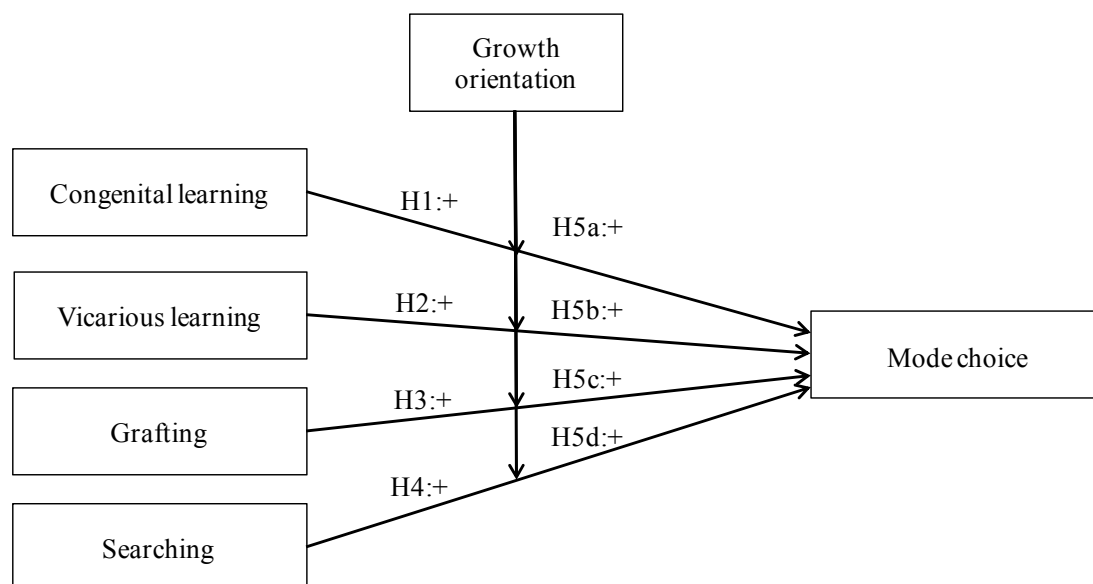


Figure 2: Congenital learning, growth orientation, and mode choice

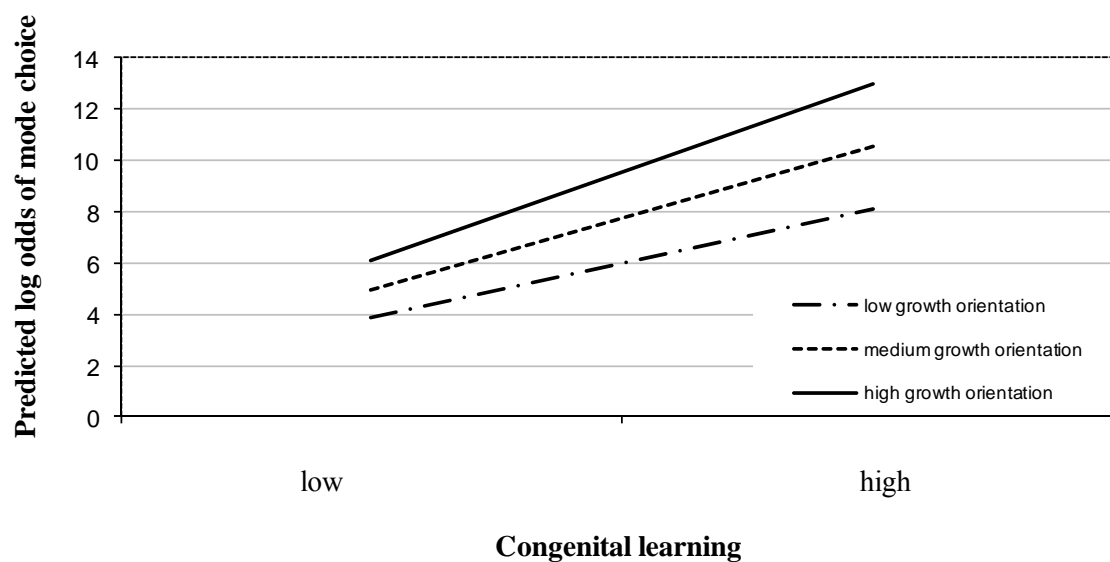


Figure 3: Vicarious learning, searching, growth orientation, and mode choice

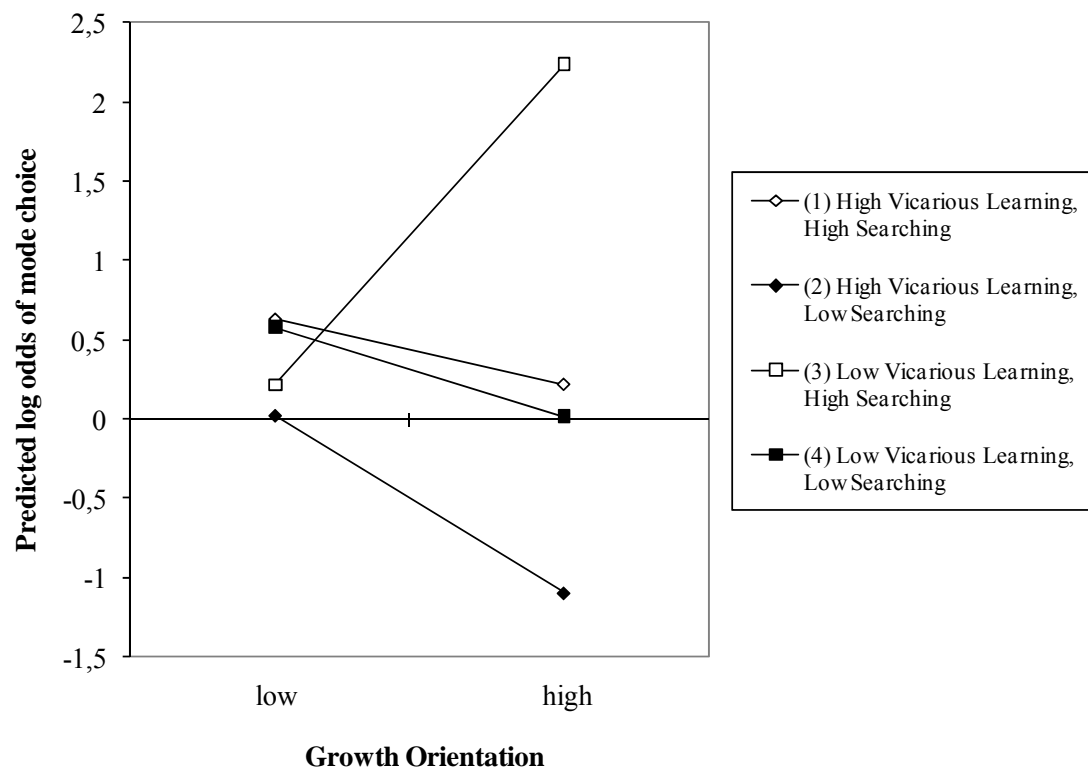


Table 1: Means, standard deviations and correlations among dependent and independent variables

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
1 Mode choice	1.75	0.88	-									
2 Congenital learning	0.52	0.50	.141*	-								
3 Vicarious learning	2.51	0.96	.164*	.103	-							
4 Grafting	3.15	1.13	.436***	.035	.359***	-						
5 Searching	2.48	1.16	.259***	.014	.599***	.313***	-					
6 Growth Orientation	3.49	1.00	-.006	.035	.112	.043	.023	-				
7 Firm size	3.05	1.44	-.095	-.087	.047	-.050	.010	.243**	-			
8 Access to customers	4.17	1.04	-.049	.036	.150*	.131†	.033	-.082	-.040	-		
9 Access to knowledge	2.83	1.25	.210**	.079	.314***	.322***	.265***	-.007	-.116	.123†	-	
10 Cultural distance	2.03	1.37	.119	.075	.047	.155*	.107	.008	-.035	.059	-.047	-

Note: Pearson Correlation (pairwise deletion); M: arithmetic mean; SD: standard deviation;

Significance levels: ***: $p \leq .001$; **: $p \leq .01$; *: $p \leq .05$; †: $p \leq .1$

Table 2: Empirical results of the ordered logistic regression

Dependent variable: Mode choice								
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
<i>Independent variables</i>								
Congenital learning		.678*	.674†	.687†	.658†	.642†	.727*	.762*
Vicarious learning		-.425†	-.388	-.395	-.392	-.368	-.388	-.438†
Grafting		1.036***	1.039***	1.127***	1.046***	1.060***	1.046***	1.233***
Searching		.501**	.479*	.545**	.482*	.473*	.465*	.532*
<i>Moderator</i>								
Growth orientation			-.143	-.210	-.148	-.076	-.153	-.291
<i>Interaction effects</i>								
Congenital learning x growth orientation				1.027**				1.373***
Vicarious learning x growth orientation					-.081			-.615*
Grafting x growth orientation						-.262		-.164
Searching x growth orientation							.164	.572**
<i>Control variables</i>								
Firm size	-.095	-.017	.000	.112	-.007	-.003	.028	.199
Access to customers	-.188	-.354*	-.369*	-.382*	-.369*	-.347*	-.356*	-.362*
Access to knowledge	.375**	.241	.251†	.211	.259†	.262†	.237	.220
Cultural distance	.233*	.161	.164	.155	.177	.179	.163	.245*
R ² (Cox & Snell)	.080	.303	.303	.334	.304	.309	.308	.368
R ² (McFadden)	.041	.179	.178	.200	.179	.182	.182	.227
R ² (Nagelkerke)	.092	.349	.349	.384	.350	.356	.355	.424
Δ R ² (Nagelkerke)	.092	.257	.000	.035	.001	.007	.006	.075
χ ² (Model-Chi-Square)	14.343	60.321	59.926	67.372	60.153	61.371	61.156	76.255
p (Significance)	.006	.000	.000	.000	.000	.000	.000	.000
N	172	167	166	166	166	166	166	166

Significance levels: ***: $p \leq .001$; **: $p \leq .01$; *: $p \leq .05$; †: $p \leq .1$