



# Knowledge acquisition, learning, and the initial pace of internationalization<sup>☆</sup>



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## ABSTRACT

We analyze how knowledge, learning, and strategic intent shape export intensity during the period surrounding the initiation of export activities in small, independent firms. Our research is conducted on a sample of small firms started in Andalusia, a region characterized by a lower proportion of exporting firms. By examining the interplay among different forms of knowledge and learning we extend stage and international entrepreneurship models of the internationalization process. We find that in addition to the expected direct effects of learning, different forms of knowledge and learning interact to shape the pace of internationalization. Additionally, we find that pre-existing foreign knowledge influences export intensity in younger firms, but not in older ones; and, that the effects of vicarious learning and experiential learning on export intensity are conditioned by firms' strategic intentions. We discuss the meaning of our results and suggest avenues for future study.

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## 1. Introduction

Understanding when firms initiate and how quickly they develop international activities has long been a topic of interest to scholars. According to the stage (Uppsala) model of internationalization (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975), knowledge plays a key role as internationalization is seen as a learning process in which knowledge acquisition leads to increasing international commitment (Andersen, 1993; Johanson & Vahlne, 1977, 1990). In this model, lack of international experience and knowledge is an impediment to venturing across borders as firms are presumed to avoid uncertainty and to prefer operating in areas of greatest experience and knowledge. This model implies a late start and a gradual build-up as businesses acquire and accumulate experiential learning in a path-dependent process (Casillas & Moreno-Menendez, 2013; Eriksson, Johanson, & Sharma, 1997; Hutzschenreuter, Pedersen, & Volterda, 2007). Because of the theorized importance of path dependencies, where the firm starts and how quickly it starts have long-term

repercussions for the firm. Over time, research has shown this model to be robust and useful.

Nevertheless, scholars interested in explaining cases that defy the stage model (i.e., instances of early and rapid internationalization) conceived alternative knowledge-related explanations for the initiation and pace of international expansion (Forsgren, 2002). The international entrepreneurship model assumes that international new ventures (INVs) are capable of starting early and expanding rapidly in international markets because of pre-existing knowledge, contacts in international markets, and rapid acquisition of knowledge (Coviello & Munro, 1995; Oviatt & McDougall, 1994, 2005). This perspective allows knowledge drivers beyond experiential learning, the core of the stage model. Alternative learning mechanisms include such factors as congenital knowledge (i.e., knowledge acquired by founders *before* creating the venture), grafted knowledge (knowledge brought to the venture by managers hired *post*-startup), and vicarious learning from outside (e.g., Bloodgood, Sapienza, & Almeida, 1996; Fernhaber, McDougall, & Shepherd, 2009; Oviatt & McDougall, 1994). In short, there is evidence that very young firms' learning is aided by founders' congenital knowledge, by the knowledge and contacts of managers in the venture as well as outside network contacts, and by observing other firms. This stream of research has proved robust and influential (De Clercq, Sapienza, Yavuz, & Zhou, 2012). Indeed, in a recent revisiting of their original model, Johanson and Vahlne (2009) recognized the importance of alternative knowledge

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sources and acquisition types: “experiential learning can be complemented with other ways of knowledge development” (2009:1417).

The stage model is a parsimonious, general model of international expansion. The INV perspective sought to focus attention on exceptions to the model, especially those related to *early initiation* and *rapid expansion* of international activities. Nevertheless, the two models have much in common. Key among the commonalities is their shared emphases on the centrality of knowledge and the path dependencies of the process. These two facets suggest that it would be particularly useful in advancing theories of internationalizing to focus attention on the interaction of knowledge and learning at the beginning of the process, i.e., when ventures begin to export. Two other opportunities for further insight also exist. First, although we have evidence that founders’ previous (congenital) experiences affect the speed of internationalizing (Bruneel, Yli-Renko, & Clarysse, 2010; Chandra, Styles, & Wilkinson, 2009; Oviatt & McDougall, 2005), we do not know how long such effects last. Second, the emphases on path dependencies and behavioral tendencies result in less attention to the strategic preferences that ventures develop over time; therefore, an examination of the role of strategic intention is also warranted. In summary, by exploring how different knowledge stocks and knowledge acquisition activities operate around the time of initial exporting [given that exporting is typically the starting point for internationalization (Johanson & Vahlne, 1990)], we can shed light on how rapidly international intensity will subsequently develop. Exploring the moderating effects of venture age and strategic intention also offer the potential for theoretical insight.

We take as our starting premise that learning and knowledge matter in internationalization, especially during the initiation of the process, and we seek to provide new insights along several dimensions. First, whereas the INV literature focused solely on the *early life* of ventures in explaining exceptions to prevailing models, international entrepreneurship literature broadened that focus to include internationalizing at any age, including those that begin exporting very late (Coviello, McDougall, & Oviatt, 2011; De Clercq et al., 2012; Zahra, 2005). We, therefore, examine whether a venture’s age when it starts exporting modifies the influence of congenital knowledge on the pace of international expansion. Second, and perhaps most importantly, we examine how knowledge stocks and knowledge acquisition activities interact to influence the pace of the internationalization process. As yet, very little is known about how multiple learning factors function jointly. Third, in order to understand more fully how path dependencies are altered by strategic choice, we examine how strategic intention moderates the effects of learning activities on international intensity.

Our study is, to our knowledge, the first to look at the interactive effects on internationalization of a wide variety of knowledge dimensions. Because we wished to look at a broad spectrum of knowledge acquisition types, we chose to use the first process identified by Huber’s (1991) in his organizational learning framework. As De Clercq et al. (2012) argued, this broad framework has the advantage of covering the range of knowledge stocks and learning activities that guide organization decisions. Following their approach, we relate these dimensions to those commonly used in the international literature. We explain this framework and our use of it in the Theory section below. To conduct this study, it was important to include firms in the initiation stages of exporting. In order to do so, we enlisted the aid of the central agency for the promotion of export activity in small firms in the Andalusia region of Spain. Andalusia is in the south of Spain and it is an interesting context for our research due to the lower proportion of exporting firms in comparison to other European regions. With the assistance of this agency we were able to collect a complete set of primary

data in 2008 from CEOs of 96 firms attending sessions on how to start and succeed in exporting; 3 years later we also collected data on the subsequent international sales intensity of these firms. Firms in our a multi-sectorial sample were precisely at the point in time we were interested in observing them, all from the same economic region, and all with ostensibly similar objectives. These factors allow us some control over potentially confounding issues but limit our ability to generalize results to the complete population of small firms in the pre- or early-export phases.

## 2. Theory

### 2.1. Learning, knowledge acquisition, and the pace of internationalization

The stage model of internationalization holds that knowledge plays a key role in internationalization (Autio, Sapienza, & Almeida, 2000; Johanson & Vahlne, 1977). The model is based on the theory of the growth of the firm (Penrose, 1959) and the behavioral theory of the firm (Aharoni, 1966; Cyert & March, 1963); it asserts that internationalization is an incremental process in which firms have imperfect access to information. This model implies gradual internationalizing as businesses acquire and accumulate experiential learning in a path-dependent process (Eriksson et al., 1997; Hutzschenreuter et al., 2007). According to Johanson and Vahlne (1977), learning through the current experiential activities of the firm reduces uncertainty (caused by psychic distance of the firm from its target market); objective knowledge is of lesser importance in this process. The stage model depicted internationalization as a recursive process in which knowledge acquisition increases commitment to international activities and resources, and, in turn, commitment increases knowledge acquisition (Johanson & Vahlne, 1990). This perspective emphasizes the role of *experiential learning*: learning from activities reduces perceived risk and encourages increased cross-border expenditures; it suggests that decisions on cross-border activities depend on managers’ perceptions of the risks and of the alternatives available (Johanson & Wiedersheim-Paul, 1975). In this view, risk perceptions are inversely related to market knowledge, so that knowledge is essential in explaining when companies begin to trade across borders and how quickly they expand. The model notes that “objective” market knowledge obtained from others can play a role, but it sees such easily transferred knowledge as being much less important in determining market commitment decisions. Stage model assumptions dominated the literature on internationalization from the 1970s to the mid-1990s, and experiential learning consequently became the most analyzed source of foreign knowledge acquisition.

In the 1990s, work emerged which sought to explain the existence of businesses that internationalize early and quickly, ventures alternatively referred to as ‘born-global’ firms or ‘international new ventures’ (Oviatt & McDougall, 1994). Subsequent developments have expanded the research purview of international entrepreneurship (IE) scholars to examining issues at the intersection of international and entrepreneurship regardless of firm age (De Clercq et al., 2012; Zahra, 2005). This perspective combines theory originating in the internationalization literature with that originating in the entrepreneurship literature (Oviatt & McDougall, 2005; Rialp, Rialp, & Knight, 2005). Whereas the stage or Uppsala model focused on a single knowledge dimension (experiential learning) as core to the timing and pace of international activities and expansion, IE scholars drew upon a broad array of potential knowledge and learning sources to explain and predict international activities (De Clercq et al., 2012). So powerful has this stream been that Johanson and Vahlne (2009, 2013) revisited their original model to consider what had been

learned in the 30 years since they published their seminal work. They maintained their view that the internationalization process is a path-dependent one in which experiential learning is key, but they also acknowledged that other types of learning could play an important role. They also revised their model to emphasize relationship knowledge in place of market knowledge.

New images about how internationalization begins, what drives it, and how it develops have emerged via these two streams of research over the last three decades. Knowledge and learning are still at the core, but the view of what type of knowledge is critical has begun to expand. Further, because path dependency is still a core component of this theorizing, understanding how things initially emerge and how quickly they emerge continues to be critical. Our aim here is to examine how knowledge and learning types work in conjunction with one another at the very beginning of export activities to set and drive the pace of internationalization.

## 2.2. Effects of knowledge acquisition on internationalization

A bewildering array of knowledge and learning schema exists both within the international studies arena and in the broader management literature (e.g., objective and experiential knowledge; market-specific knowledge, foreign market knowledge, foreign organizing knowledge, foreign institutional knowledge; tacit and explicit knowledge; internal and external knowledge; exploration and exploitation; declarative and procedural knowledge, and so on). In the stage model tradition, experiential knowledge obtained through current activities in foreign markets and objective knowledge derived from external sources comprise the core of knowledge and knowledge acquisition (e.g., Eriksson et al., 1997; Johanson & Vahlne, 1977). In the IE stream, no single schema dominates, and a diverse range of knowledge types have been used (Bruneel et al., 2010; Fernhaber et al., 2009; Levesque, Minniti, & Sheperd, 2009). In this paper, we are in fact interested on different knowledge acquisition types. For that reason, following De Clercq et al. (2012), we use Huber's (1991) schema of knowledge acquisition types, as a sub-process of organizational learning. This schema arguably includes the full range of means by which organizational knowledge is obtained and is available to the firm; it should be noted too, however, that although the dimensions in the model are somewhat exhaustive and conceptually distinct, in practice knowledge acquisition cannot be easily separated into parts or be identified without some overlap. Huber (1991) conceptualizes organizational learning into four interrelated concepts: knowledge acquisition, the means by which knowledge is gathered; organizational memory, the means by which knowledge is held for use by organization members; the distribution of information, the distribution and locale of stored information; and, information interpretation, the means by which meaning is generated and shared understanding of information is achieved.

Our focus is on the five major dimensions of knowledge acquisition in Huber's framework: (1) Congenital knowledge is knowledge acquired by the firm's founders prior to creating the current venture; this knowledge plays a large role in the international new venture framework (Autio et al., 2000) as it is said to explain why some firms leap rapidly into international competition and why they may be unafraid to expand rapidly. (2) Grafted knowledge is knowledge acquired by hiring on managers who have international experience outside the firm; this knowledge may help reduce perceived uncertainty and help the firm identify opportunities elsewhere. Congenital and grafted knowledge stocks have become increasingly important in theorists' eyes because they also represent potential pre-existing network contacts that might be used by the firm as it expands internationally (Johanson & Vahlne, 2009). (3) Experiential

knowledge comes from the direct activities that the firm conducts in the process of doing business; such learning is often an unintended by-product of operating, though it may involve conscious learning purposes. This type of learning is deemed especially important and influential not only because it is difficult to acquire in other ways but also because it represents the interplay of organizational routines directly with context, providing immediate feedback and re-enforcing lessons with tangible and visceral experience. (4) Vicarious learning is learning achieved by observing the actions and results of others in the field; this is a process that is less costly than direct experience and less viscerally relevant; yet vicarious learning can involve both tacit and explicit learning. (5) Search is the process of seeking explicit information on the countries, markets, institutions and the like in targeted areas; it is roughly the equivalent of objective market knowledge in the schemas of stage model proponents. Of the three types of learning activities (experiential, vicarious, and search), search is the most conscious and explicit.

Based on prior research, our premise is that learning increases the inclination and the ability to expand rapidly in new foreign markets through exports.<sup>2</sup> Our intent is to expand internationalization theorizing by closely examining aspects of the process around first consideration of exporting activity. We assume that exporting firms have knowledge needs different from firms in other more developed modes of operations. What is most in need of illumination is how various learning types interact with one another or strategic circumstances to influence the pace of export expansion. Specifically, we examine (1) the length of time that pre-existing knowledge of founders influences export intensity; (2) how knowledge grafted onto the firm interacts vicarious learning and search to influence the pace of exporting intensity; (3) how experiential learning and search interact to influence exporting intensity; and (4) how strategic intentions moderate the effects of learning activities on export intensity.

### 2.2.1. Congenital knowledge and age of the venture

Export activities, as a learning process, develops as a dynamic fit between the venture's existing stock of knowledge and the acquisition of new knowledge. Existing knowledge influences how new knowledge is assimilated and interpreted by firms' managers (Huber, 1991; Johanson & Vahlne, 1977). Consistent with this path-dependent view of internationalization, INV literature emphasizes the importance of variations in the stocks of knowledge present at inception. Oviatt and McDougall (2005) assert that founder's history matters, so that congenital knowledge affects the initial international trajectory of new ventures.

Although the stage model of internationalization is silent on the potential of congenital knowledge to reduce the perceived risks of internationalizing, several arguments suggest that it should reduce perceived costs of crossing borders (Sapienza, Autio, George, & Zahra, 2006). First, international experiences of key managers or founders prior to founding make them aware of the value of opportunities abroad and of common practices used to exploit those opportunities (Chandra et al., 2009). As De Clercq et al. (2012) note, founders with prior international experience are more aware of international opportunities, more capable of assessing such opportunities, and more favorably disposed to pursuing such opportunities than ventures whose founders lack such experience. Second, prior experience in foreign markets increases managers' belief in their ability to assess alternatives in foreign markets (Bruneel et al., 2010) and increases the venture's confidence in its

<sup>2</sup> March (1981) noted that learning may also have negative effects: firms may learn the wrong things or they may learn about impediments or costs that discourage continued effort. This perspective has not been investigated fully in the literature. We thank an anonymous reviewer for this observation.

ability to successfully navigate the perils of reaching beyond its domestic borders (Lamb, Sandberg, & Liesh, 2011). Without such confidence, the venture's leaders are much less likely to investigate export possibilities and will see such actions as relatively risky in the near future.

Nevertheless, we expect that the influence of congenital knowledge will decrease as firms age. As time passes, founders become removed from their prior experiences. Prior knowledge is replaced by other, more current views and information. Whereas previous research notes evidence that congenital knowledge is related to becoming an early internationalizer (Chandra et al., 2009; Kocak & Abimbola, 2009; Reuber & Fischer, 1997), Bruneel et al. (2010) found weaker influence of congenital knowledge as experiential learning in the international markets increases. In summary, congenital knowledge (i.e., the stock of international knowledge founders bring from prior experience) positively influences the future export intensity of the firm. However, the impact of congenital knowledge tends to decrease as firms age:

**H1.** The effect of congenital knowledge on export intensity decreases as ventures age.

### 2.2.2. Grafted knowledge and active learning

Firms in the process of internationalizing can also enhance their stock of foreign knowledge at any time by “grafting” on new outside managers who possess the kind of foreign knowledge that they lack. Several authors claim that internationalization can be traced to the international socio-demographic characteristics of firms' managers (Athanasios & Nigh, 2000; Bloodgood et al., 1996; Gray, 1997; Reuber & Fischer 1997). Numerous others note a positive relationship between the international experience of hired managers and exporting (Holzmüller & Kasper, 1991; Peng & York, 2001; Philp, 1998). The cause for such positive effects include increased awareness, increased confidence in decisions, and greater knowledge of foreign markets. Grafted knowledge helps overcome the inertia brought on by uncertainty, regardless of whether outside managers were hired with the explicit purposes of supplementing existing international knowledge or not. It is likely that grafted knowledge is less useful in exports than in other entry modes, because exports are the least complex mode to expand abroad. Exports use to be the first step in the internationalization process and, compared to more developed modes (e.g., joint ventures or foreign direct investments), its operations only impacts a limited number of firm dimensions, mainly the commercial ones. For that reason, exporting firms are not likely to hire managers with high international experience, at least to a large extent. However, we expect that higher grafted knowledge improve the absorptive capability of external knowledge, as searching and vicarious learning (De Clercq et al., 2012).

Both the stage model and the IE model of internationalization suggest that experiential learning activities will have an effect on the initiation and pace of internationalizing. Whereas experiential learning is directly relevant, tacit, and viscerally potent (Bruneel et al., 2010), to have an effect, vicarious learning and search may require a “sympathetic” filter to have an influence. The direct impact on export intensity of observing others (vicarious learning) or of searching for objective knowledge is not clear (Eriksson et al., 1997). We expect that grafting new managers on to the firm makes searching and vicarious learning more important than either would be if grafting did not occur. Several reasons exist for this expectation. First, because hired-in managers may be less attached to the current domestic market than are incumbent executives, they may bring an external focus and positive attitude to cross-border opportunities (Sapienza et al., 2006). Second, managers with strong international backgrounds have necessary absorptive capacity vis-a-vis foreign markets (Cohen & Levinthal, 1990); this

capacity will aid in assimilating, transforming, and exploiting new knowledge (Zahra & George, 2002). As Zahra and George (2002) claim, exposure to knowledge per se does not guarantee that a firm will have more effective learning. The impact of this capacity depends, among other things, on the complementarity between new and existing knowledge (Lofstrom, 2000). In short, for ventures interested in exporting, engaging in search and vicarious learning will matter more when internationally experienced managers are hired in.

In summary, grafted knowledge helps to unleash the learning potential in search and vicarious learning through its effect on greater awareness of opportunities, more positive interpretation of such opportunities, and greater capacity to exploit such opportunities. While we expect both search and vicarious learning to enable more rapid export intensity, we also expect that these effects will be stronger when the firm has added more internationally experienced managers. Thus:

**H2a.** Grafted knowledge positively moderates the influence of search on export intensity such that the positive influence of search is stronger the greater the grafted knowledge.

**H2b.** Grafted knowledge positively moderates the influence of vicarious learning on export intensity such that the positive influence of vicarious learning is stronger the greater the grafted knowledge.

### 2.2.3. Experiential learning and active search

As noted above, we expect that active learning in the form of search and vicarious learning will have greater effects on export intensity when the firm brings in outside managers with foreign knowledge, that the mix of knowledge stock and knowledge activities will re-inforce one another.

The interactive effects of learning activities may not be as straightforward. Vicarious learning is a kind of hybrid learning that involves both tacit and explicit dimensions, whereas experiential learning is dominated by tacit, unconscious processes, and search is dominated by explicit, objective learning.<sup>3</sup> Search is aimed at the firm's uncovering “objective” knowledge from third parties; vicarious learning involves seeing what others are doing, with or without explicit knowledge transfer; and, experiential learning involves action and feedback as the firm operates. It is difficult to say how firms make sense of differences between what they do (experiential) and what others do (vicarious). Particularly interesting, however, and more straightforward to speculate about is the potential interplay of the two “pure” types of activities, experiential learning and search.

Bruneel et al. (2010) argue that experiential learning moderates the post-entry effects of congenital knowledge and vicarious learning on further internationalization. They offer several reasons why experiential learning comes to have such dominant effects: it is more recent and salient than congenital and vicarious learning, and it is targeted to the specific foreign markets being considered (in ways that grafted or congenital knowledge may not be). There are reasons, then, to believe that experiential learning will have a dampening effect on the outcomes of active search for new foreign knowledge. First, regardless of whether the firm “likes” what it learns in search or not, as experiential learning builds, it is likely to overwhelm the effects of “objective knowledge.”

One interesting aspect of searching is that it has been at times proposed as an instrument of confirming decisions rather than as

<sup>3</sup> Huber (1991) notes that one form of search (“noticing”) can involve unintended learning. In this study, however, we measure intentional search for new foreign knowledge. It should also be noted that firms can have experiential learning even before exporting, as they can conduct other activities abroad (Bingham, 2009).



actual search for real new knowledge. Huber (1991) claims that decision makers' seeking to "legitimate" their positions (for or against something) can initiate "fact-finding" efforts to gather support. Such efforts can be expected to have less effect as firms attain higher and higher levels of experiential learning; (i.e., 'manufactured' facts may not be believed by those with counter experience). At the same time, even if search is not political, we would expect the impact of such third party information to be lessened by the accumulation of relevant experiential knowledge. Indeed, for firms in the pre- or very early export stage, one may expect that experiential foreign learning is rather low and that search is essentially a substitute for this knowledge; as experiential knowledge builds, the impact of continued search efforts should diminish.

In summary, we expect the effects of search on export intensity to be moderated by experiential learning such that the importance of search diminishes as experiential learning builds:

**H3.** Experiential learning moderates the influence of search on subsequent export intensity such that the greater the experiential learning the weaker the effect of search.

#### 2.2.4. Strategic intent and learning activities

Given the behavioral roots of both stage and IE models of internationalization, it is not surprising that the literature has heretofore emphasized the role of learning activities in shaping the perceptions, intentions, and choices of managers in the internationalization process rather than the reverse. Nevertheless, firms can and do shape strategic intentions that also guide these activities and influence their outcomes. As Johanson and Vahlne (2009) observe, intentions play a key role in determining where managers focus their attention, how much effort they put forth, how they internalize and interpret new information, and what decision and actions develop. Indeed, it is difficult to disentangle the causal path between intentions and actions at a given point in time.

A simplifying assumption might be that the more actively firms engage in foreign learning activities, the greater their desire to internationalize rapidly. Yet, this is not necessarily so: variations in learning activity may reflect many different possibilities. For example, a firm may not wish to export but feel forced by poor market conditions; alternatively, a firm may feel pulled by the possibility of a huge opportunity or of a rapidly closing window of opportunity. Our earlier discussion of searching for confirming or disconfirming information also reveals that learning activities do not always covary with positive intentions. It is possible that firms have strong intent to internationalize but lack learning opportunities. Fernhaber et al. (2009) note that the internationalization knowledge of alliance partners and of proximal firms varies significantly, providing greater incentive or disincentive to put forth learning effort, regardless of the strength of the firm's strategic intentions. Furthermore, some firms appear to have a "learning orientation," regardless of the strength of their intentions to internationalize (De Clercq, Sapienza, & Crijns, 2005; De Clercq et al., 2012).

In short, it appears that strategic intentions are unlikely to be perfectly reflected in learning effort. Previous studies have described the gap between the acquisition of export information and the use of this information (Toften & Olsen, 2003). We argue that strategic intention alters the likely impact of foreign learning activities. In simple terms, positive strategic intentions toward exporting are likely to function as a kind of "rose-colored" filter for the new knowledge that comes into the venture. For example, firms that want to expand export activities rapidly will likely frame the result of search activities in the most positive ways possible—indeed, firms may search

only where they expect positive feedback. Higher aspirations for international growth (and consequently greater intention to rapidly internationalize) push firms to vicariously learn from or observe only those firms that have achieved rapid growth themselves; such observations likely yield greater confidence and intensified internationalization effort. Finally, when international strategic intentions are low, the salience of experiential knowledge is apt to be low and may remain unrealized or uncoded knowledge; however, when such intentions are strong, the firm is more likely to attend to, learn from, and be inspired by its experiential foreign learning. So, we propose:

**H4a.** Export intention positively moderates the influence of search on subsequent export intensity such that the stronger the export intentions the stronger the positive effects of search.

**H4b.** Export intention positively moderates the influence of vicarious learning on subsequent export intensity such that the stronger the export intentions the stronger the positive effects of vicarious learning.

**H4c.** Export intention positively moderates the influence of experiential learning on subsequent export intensity such that the stronger the export intentions the stronger the positive effects of experiential learning.

### 3. Method

#### 3.1. Sample and data collection

We sought to study the period surrounding the initiation of export in small, independent firms. In order to do so, it was necessary to identify firms seriously interested in exporting as well as those that had within the last year initiated exporting. We had the opportunity to do this when a regional agency, Extenda, in the Andalusia region of Spain, joined with a local University to offer seminars for local independent firms on the initiation or early expansion of exporting. Instructors were practitioners and faculty members knowledgeable about exporting in the region. One of the authors participated in this course and collected data from firms as part of their interaction. The course was funded by the European Commission Social Fund. Seminars ran from October 2007 to March 2008 and included modules on international commerce, marketing, negotiation, and other topics. A total of 182 independent companies from Andalusia participated. In short, our sampling population is a self-selected set of firms interested in beginning or expanding their export activities.

With the assistance of Extenda, we identified a total of 103 businesses in the course that fit our criteria of being in the pre- or very early stages of exporting (i.e., had begun their export activities within the last year). By sampling in one region of one country we were able to provide some powerful controls for country and regional differences that may otherwise have affected export intent or opportunities (e.g., size of addressable market, or regional economic growth). Of course, the tradeoff is that generalizability to other regions and times are limited.

In January 2008 we surveyed the CEO or highest rank person in each of these companies. As completing the survey was an expected part of the course, we had responses from all of the 103 identified companies. The use of a single respondent derives from the fact that, it is common in SME research the decision-making competence on internationalization to fall on only one person (Gray, 1997). Of these 103, six provided incomplete or inconsistent responses and were removed from the sample; one company was discovered to have been exporting for several years and was excluded from our data set. Our final sample included 96

companies (37 pre-exporters and 59 early-exporters), which were classified into four basic economic sectors: 26 in agriculture, 16 in high technology manufacturing, 21 in low technology manufacturing, and 33 in service. The average age of businesses in our sample is 18 years. Although the average size is 338 employees, most firms are SMEs—the median size is 12 employees. Also, 77.7 per cent of the firms have less than 50 employees, and 81.9 per cent of them have less than 100 employees.

All data for the independent variables (controls and predictors) were collected in early 2008. As described later in this section, we conducted a follow-on survey 1 year later as a validity check on some of the variables, and we collected our dependent measure, export intensity, 3 years later. These two later data collection efforts reduce common method issues and reduce the problem of reverse causality associated with purely cross-sectional data.

### 3.2. Measures

#### 3.2.1. Dependent variable

*Export intensity.* As a measure of the speed with which the firms in our sample increase their internationalization, we collected data on the ratio between export and total sales of the firm in 2011. During the first data collection in 2008 we collected the same data on these firms in 2007. In our hypotheses tests we regress export intensity in 2011 against our predictor variables, controlling for initial export intensity at the beginning of the time period as well as other controls as described below. Export intensity has often been used as a proxy for export performance (e.g., Filatotchev, Stephan, & Jindra, 2008; Gao, Murray, Kotabe, & Lu, 2010; Lages, Jap, & Griffith, 2008). The time gap is enough for firms to transform intentions and behaviors into results in international markets.

#### 3.2.2. Moderators of knowledge and learning

*Age* was measured as the difference between the year of the survey (2008) and venture founding. We use a log form in our regressions to adjust for skewness, though analyses show that our results are robust to the form of this variable.

In order to assess the firm's strategic export intentions, we examined the extent to which they planned or intended to begin or to increase export sales activity (*export intention*). We operationalized future export intent using two questions: (1) the first one, asked to those firms that had not yet begun to export, was: "how likely is it that the company will become a regular exporter next year?" (1 = no chance to 7 = certain); and (2) the second one, asked to those firms that had initiated their export activities within the last year, was: "how likely is it that the company will increase export activities in the coming year?" (1 = no chance to 7 = certain). For the purpose of our overall analyses, we standardized the values of answers for each group of firms and examined the entire sample in a single regression.

#### 3.2.3. Knowledge and learning variables

We created five separate multi-item scales to measure the five basic knowledge acquisition types of Huber (1991). Huber's model includes unitary descriptions of congenital knowledge, grafted knowledge and vicarious learning; it includes five sub-dimensions for experiential learning and three sub-dimensions for search. However, we did not attempt to collect separate measures for the sub-dimensions because doing so with multi-item scales would have required a great number of items to capture all dimensions and sub-dimensions and would have threatened the likelihood of obtaining responses from the seminars' participants.

Consistent with Huber's typology, we aimed all items at the company level of activity rather than that of individual managers. However, we also assume that some learning processes directly depends on individuals, e.g., in congenital, grafted and vicarious

learning. We created the scales from a thorough review of the literature combined with interviews of academics and practitioners involved in early export. Once we had written the questions, we pre-tested the scales with seven export managers of newly exporting firms; our primary purpose in this stage was to ensure that the managers fully understood the questions as stated in our survey. Slight wording adjustments were made at this point, and we ended with a potential set of 44 items for our five construct measures. All questions were aimed at activities carried out by the company or its founders in the process of acquiring international knowledge. The items were on Likert-type scales of 7 points.

While the constructs were well-defined in the literature, some conceptual and practical overlap suggested that we should carefully assess the distinctiveness of the individual types. We conducted confirmatory factor analyses to examine the data structure; as expected, five factors emerged with eigen values above 1. We used the Varimax rotation procedure to assemble the set of measures that minimized cross loadings and resulted in reliable measures. The final set of items used for our measures and the factor loadings are shown in Appendix 1. All items loaded strongly on one factor only ( $>.70$  on that factor and  $<.40$  on all other factors). Reliability tests show that the measures are highly reliable, with acceptable Cronbach alpha levels: congenital knowledge ( $\alpha = 0.89$ ), grafted knowledge ( $\alpha = 0.93$ ), experiential learning ( $\alpha = 0.87$ ), vicarious learning ( $\alpha = 0.88$ ), and search activities ( $\alpha = 0.92$ ). For our hypotheses tests, factor loadings were used; the correlations in Table 1 are for these factor scores. To give the reader a sense of the magnitude of the variables, we present the means of the unweighted variables in Table 1.

#### 3.2.4. Control variables

We included variables to control for factors that might account for confounded associations between knowledge types and future export intensity. We controlled for size (number of employees) and age (also a moderator variable) of the companies because prior research has suggested that the size or age of a venture may be related to its internationalization. Although Table 1 shows the mean for each of these, in hypotheses tests we used the log forms of these measures to correct for skewness. Because different industries and sectors may grow or develop at different rates and because the availability of international knowledge may vary by sector, we also controlled for the sector of the economy (represented by a 0, 1 dummy variable) in which each company operated. In the hypotheses tests, the service sector was the omitted or base case; agriculture, high-tech manufacturing, and low-tech manufacturing were included in the equations. Results are robust to whichever sector is omitted. Finally, we included two additional control variables suggested by the literature, which may be independent of knowledge activities but may affect export intent. For example, it has been suggested that internationalization may be driven by innovativeness of the company (e.g., Bilkey & Tesar, 1977; Lim, Sharkey, & Kim, 1991), and the process theory of internationalization has suggested that decisions are based on risk avoidance (Johanson & Vahlne, 1977, 1990). Therefore, we constructed self-reported measures of innovativeness and risk-taking and included these as controls in our hypotheses tests.

#### 3.2.5. Validity

The reliability and factor analyses scores reported above indicate the internal validity of our data, as do expected observed correlations among variables (e.g., see Table 1 for positive and significant correlations between size and age, risk-taking and innovativeness). Such observations provide confidence that questionnaires were answered carefully and that our basic measures tap intended constructs. Finally, a potential issue with single source data is the possibility that consistency bias may

**Table 1**  
Descriptive statistics and correlation matrix.

	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Export intensity 2011	3.238	7.385	1.000													
2. Export intensity 2007	0.415	1.157	0.255*	1.000												
3. Size	338.760	1845.201	0.188	0.054	1.000											
4. Age	18.284	20.413	0.136	0.114	0.229*	1.000										
5. Agriculture	0.271	0.447	−0.045	−0.078	−0.027	−0.011	1.000									
6. HTManufacturing	0.167	0.375	0.031	−0.055	−0.002	0.058	−0.273**	1.000								
7. LTManufacturing	0.219	0.416	−0.045	0.086	−0.140	−0.171	−0.322**	−0.237*	1.000							
8. Innovativeness	4.281	1.600	0.082	−0.138	0.174	−0.018	−0.093	−0.018	0.025	1.000						
9. Perceived risk	3.770	1.167	−0.028	0.049	−0.196	−0.192	−0.048	0.040	0.010	0.217*	1.000					
10. Export intention	5.094	1.072	0.280**	0.101	0.017	−0.032	0.069	−0.110	0.057	0.148	−0.079	1.000				
11. Congenital knowledge	2.954	1.894	−0.056	−0.031	−0.005	−0.391**	−0.032	−0.030	−0.007	0.089	0.091	0.105	1.000			
12. Grafted knowledge	2.750	1.959	−0.137	−0.038	0.066	−0.036	0.082	−0.054	−0.017	−0.027	0.014	0.084	0.033	1.000		
13. Experiential learning	2.968	1.852	0.506**	0.223*	0.230*	0.117	−0.110	0.090	0.009	0.101	0.023	0.347**	0.006	0.006	1.000	
14. Vicarious learning	3.595	1.747	0.232*	−0.077	−0.004	−0.189	−0.018	0.028	0.007	0.152	−0.004	0.299**	0.042	0.043	0.008	1.000
15. Search	3.674	1.749	−0.020	0.074	−0.035	−0.030	−0.134	−0.067	0.090	0.212*	0.115	0.341**	0.046	0.048	0.009	0.064

Note: For the five knowledge acquisition variables, descriptive statistics (mean and standard deviation) are based on raw values, while correlations are calculated from factor scores.

\*\*\*  $p < .001$ .

\*\*  $p < .01$ .

\*  $p < .05$ .

induce respondents to make responses artificially consistent. Thus, it would be possible that responses on knowledge acquisition activities would be artificially related to those on export intensity. The likelihood of respondents being able to make responses artificially consistent with past responses is very low when a significant interval between responses is introduced. Therefore, 1 year after the first survey, we contacted a random subset of the original 96 companies. We received 45 completed responses, and found that the new measures all correlated significantly with the original set, indicating that the initial results likely reflect real correlations.

### 3.3. Analyses

To test our hypotheses, we use a hierarchical regression model. Control variables are entered in the first step (model 1); the main effect predictor variables (knowledge acquisition types) are introduced in the second step (model 2); and, the interaction effects are entered in the third step, first one at a time (model 3–9), and, afterwards, all interactions at once (model 10).

It should be noted that our sample was intendedly non-random: that is, it examined only companies who had self-selected into a seminar on exporting and therefore does not generalize to a broader population. Nevertheless, we also conducted a Heckman (1979) two stage selection model as a robustness test, examining the potential that some other unobserved variable might be affecting results. We conducted this Heckman procedure by selecting an additional independent variable used as a dummy (we used the language web page variable described above). Test results are virtually identical to the results reported below and indicate no evidence of additional selection issues.

## 4. Results

Table 1 presents means and bivariate correlations among our variables. Some interesting correlations are worth noting. As might be expected, age and size of the venture are positively correlated. Export intention is positively correlated with the three learning activities—search, vicarious learning and experiential learning; however, it is not correlated with either type of knowledge stock (i.e., congenital knowledge and grafted knowledge). Interestingly, export intention is uncorrelated with export intensity in 2007, but it is positively correlated with export intensity in 2011. Finally, we observe here that other key controls are typically uncorrelated

with our predictors (except for innovativeness which is moderately correlated with search) or with our outcome variable.

### 4.1. Tests of hypotheses

Table 2 presents the results of our hypotheses tests of the predictors of export intensity. Before examining our interaction predictions, we present two models that display direct effects of all the variables. Model 1 introduces the control variables. Model 2 introduces the five knowledge and learning variables. We made no direct hypotheses regarding the direct effects of learning activity on export intensity, but we expected that greater foreign knowledge and learning would result in greater export intensity in the near future. Results indicate that experiential and vicarious learning are related to export intensity; a surprising relationship is that grafted knowledge is negatively related to future export intensity in this model.

Models 3 through 10 provide tests of our hypotheses. Models 3 through 9 introduce our interaction terms one at a time, and Model 10 displays all variables at once. Models 3 and 10 show a significant negative effect of the interaction of age and congenital knowledge on export intensity ( $\beta = 0.44$ ,  $p < 0.05$ ;  $\beta = 0.40$ ,  $p < 0.05$ ). These results support H1 that the effect of congenital knowledge on export intensity is less the older the firm is. (The specific patterns of all significant interactions are illustrated in Figs. 1–5.)

Supporting H2a, models 4 and 10 indicate a positive and significant interaction effect on export intensity of grafted knowledge and search intensity ( $\beta = 0.19$ ,  $p < 0.10$ ;  $\beta = 0.20$ ,  $p < 0.01$ ). As explained later, the pattern of this interaction was a little different than the one we anticipated. Models 5 and 10 also display a positive interaction effect on export intensity of grafted knowledge and vicarious learning; however, the terms are not significant and, thus, H2b is not supported.

Models 6 and 10 indicate a significant negative interaction effect of experiential learning and search ( $\beta = -0.46$ ,  $p < 0.001$ ;  $\beta = -0.49$ ,  $p < 0.001$ ), supporting H3. This result indicates that the higher the level of experiential learning, the less impact search has on export intensity.

In terms of our predictions regarding how strategic intentions moderate the effects of learning activities, two of the three hypotheses garner support. First, although there is a positive interaction between strategic intention and search as predicted in H4a, neither the individual test (model 7) nor the simultaneous test (model 10) indicate a significant effect on export intensity;

**Table 2**

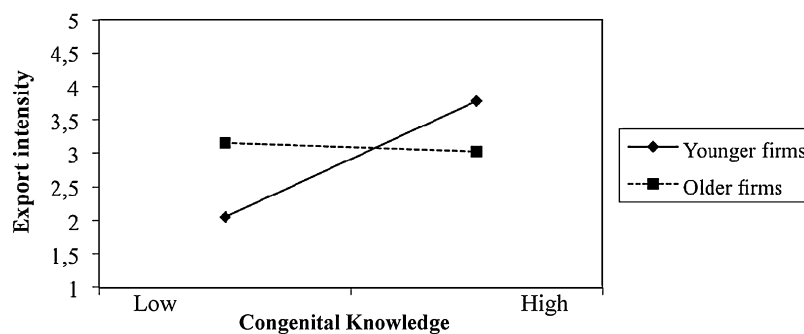
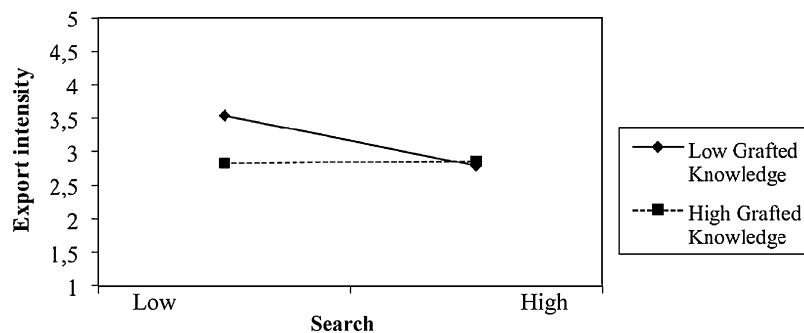
Hypotheses tests (DV: export intensity).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Constant	−0.773	0.858	−0.105	1.270	0.836	0.891	1.151	−0.429	−1.637	3.610
LnSize	0.146	0.082	0.074	0.066	0.109	0.029	0.085	0.102	0.168 <sup>†</sup>	0.126
LnAge	0.144	0.168	0.113	0.166	0.070	0.223 <sup>†</sup>	0.166	0.205	0.053	0.084
Agriculture	−0.062	0.000	0.034	0.005	−0.055	0.086	−0.004	0.025	0.010	0.172 <sup>+</sup>
LTManufacture	0.100	0.031	0.012	0.067	−0.021	0.001	0.034	0.043	0.033	−0.061
HTManufacture	−0.076	−0.064	−0.040	−0.072	−0.090	0.044	−0.067	−0.022	−0.009	0.153 <sup>†</sup>
Innovativeness	0.038	−0.027	−0.007	−0.011	−0.019	−0.061	−0.039	0.001	−0.012	0.034
Risk	0.018	0.035	0.033	0.007	−0.060	0.037	0.039	0.007	0.041	−0.043
Export intensity 2007	0.222 <sup>++</sup>	0.155	0.127	0.180 <sup>†</sup>	0.195 <sup>†</sup>	0.175 <sup>+</sup>	0.151	0.153	0.170 <sup>†</sup>	0.221 <sup>++</sup>
Export intention	0.313 <sup>++</sup>	0.159	0.140	0.172	0.115	0.089	0.138	0.229 <sup>†</sup>	0.395 <sup>++</sup>	0.357 <sup>++</sup>
Congenital knowledge		0.032	0.438 <sup>+</sup>	0.034	−0.010	−0.027	0.035	0.049	0.030	0.401 <sup>+</sup>
Grafted knowledge (GK)		−0.186 <sup>†</sup>	−0.181 <sup>†</sup>	−0.234 <sup>+</sup>	−0.111	−0.131	−0.188 <sup>†</sup>	−0.175 <sup>†</sup>	−0.221 <sup>†</sup>	−0.163 <sup>+</sup>
Experiential learning		0.391 <sup>+++</sup>	0.366 <sup>++</sup>	0.361 <sup>++</sup>	0.368 <sup>++</sup>	0.440 <sup>+++</sup>	0.390 <sup>++</sup>	0.376 <sup>++</sup>	0.115	0.057
Vicarious learning		0.237 <sup>+</sup>	0.207 <sup>+</sup>	0.207 <sup>+</sup>	0.238 <sup>+</sup>	0.226 <sup>+</sup>	0.235 <sup>+</sup>	0.200 <sup>+</sup>	0.195 <sup>+</sup>	0.071
Search		−0.078	−0.123	−0.021	−0.070	−0.172 <sup>†</sup>	−0.068	−0.063	−0.059	−0.182 <sup>†</sup>
H1 age × congenital knowledge			−0.479 <sup>+</sup>							−0.464 <sup>++</sup>
H2a GK × search				0.188 <sup>†</sup>						0.197 <sup>++</sup>
H2b GK × vicarious learning					0.173					0.012
H3 search × experiential						−0.462 <sup>+++</sup>				−0.485 <sup>+++</sup>
H4a export intention × search							0.048			0.008
H4b export intention × vicarious								0.202 <sup>†</sup>		0.218 <sup>++</sup>
H4c export intention × experiential									0.459 <sup>+++</sup>	0.434 <sup>+++</sup>
R <sup>2</sup> adjusted	0.125	0.306	0.343	0.327	0.330	0.495	0.298	0.333	0.417	0.720
Chi-square	0.024	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Increase R <sup>2</sup>	0.221 <sup>+</sup>	0.203 <sup>++</sup>	0.038 <sup>+</sup>	0.026 <sup>†</sup>	0.023 <sup>†</sup>	0.163 <sup>+++</sup>	0.298	0.030 <sup>+</sup>	0.099 <sup>+++</sup>	0.409 <sup>+++</sup>

+++  $p < .001$ .++  $p < .01$ .+  $p < .05$ .†  $p < .10$ ;  $p$ -values for two-tailed test.

thus, H4a is not supported. However, models 8 and 10 indicate a significant, positive interaction of export intention and vicarious learning ( $\beta = 0.20$ ,  $p < 0.10$ ;  $\beta = 0.22$ ,  $p < 0.01$ ), supporting H4b. Furthermore, H4c is supported via the strong positive interactions between export intention and experiential learning ( $\beta = 0.46$ ,  $p < 0.001$ ;  $\beta = 0.43$ ,  $p < 0.001$ ) displayed in models 9 and 10.

In summary, five of our seven hypotheses were supported. Our results indicate that knowledge and learning factors of small independent businesses in nascent stages of export activity interact with the age of the firm, with one another, and with the firm's strategic intentions to predict the early trajectory of export intensity in small businesses just beginning or considering export.

**Fig. 1.** (H1) Interaction between congenital knowledge and venture age.**Fig. 2.** (H2a) Interaction between grafted knowledge and search.



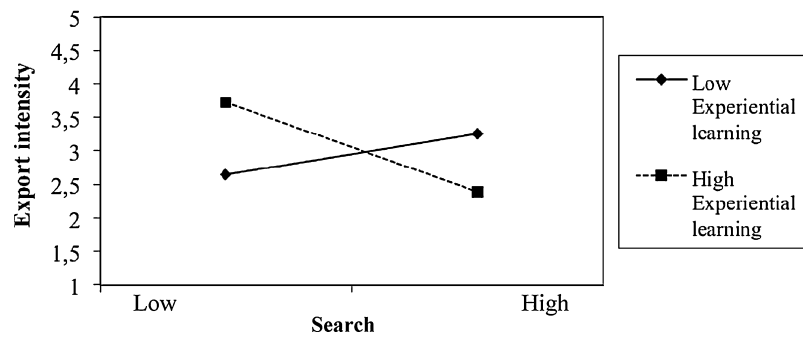


Fig. 3. (H3) Interaction search KA and experiential learning.

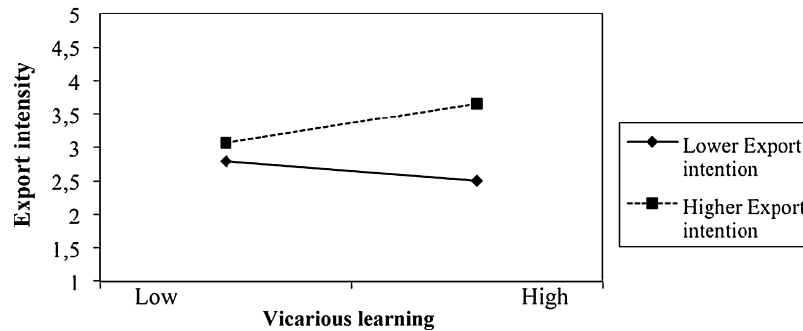


Fig. 4. (H4b) Interaction between export intention and vicarious learning.

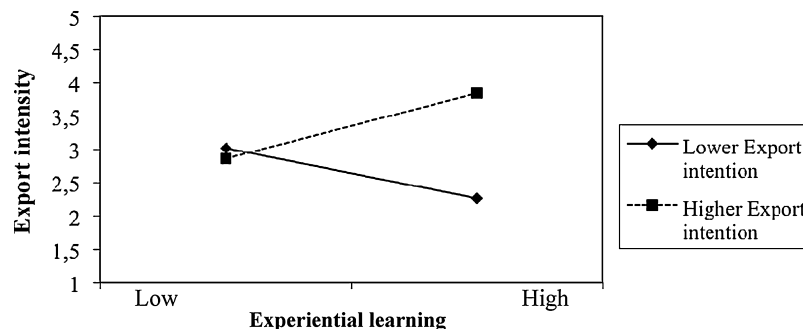


Fig. 5. (H4c) Interaction between export intention and experiential learning.

#### 4.2. Supplementary analyses

A key objective for us was to begin to understand how internationalizing takes hold and develops, and how the pattern itself is affected by activities surrounding those initial actions. In order to look at this we engaged ventures that had just started to export and those that had an interest but were not yet actually exporting. It seemed intuitive to us that the learning actions undertaken, and their effects on subsequent choices, might differ among those who were already engaged versus those who had not yet begun. Given the small size of our sample and lack of clear theoretical expectations, we did not develop hypotheses regarding differences. Nevertheless, for exploratory purposes we divided our sample into those in the pre-exporting phase (pre-exporters) and those already exporting (exporters) to see if the activities and patterns differed.

Table 3 presents the same regressions as we conducted before, but broken into a pre-exporter and an exporter group. The general pattern of results is the same but a few differences are observable. First, search, which has no direct effect on later export intensity in the full sample (see model 2, Table 2), has strong positive impact on

later export intensity in the pre-exporter subsample. Additionally, for pre-exporters grafted knowledge moderates both search and vicarious learning effects in the manner predicted, whereas grafted knowledge moderates neither for those already exporting. Finally, strategic intention interacts with search and vicarious learning but not experiential learning in those not yet exporting; conversely, strategic intention interacts with experiential learning but not search or vicarious learning for those already exporting.

For space considerations, we do not report the means here for the knowledge and learning variables, but they reveal a pattern not observable in these regression results. For those already exporting the mean levels of learning activities (experiential learning, vicarious learning, and search) are notably higher than they are for those who had yet to begin their exporting.

#### 5. Discussion

This study was aimed at providing deeper insight into how the pace of internationalization is affected by the knowledge possessed and the learning activities engaged in as firms begin to export. Based on two robust streams of literature, we began

**Table 3**

Supplementary regression analysis by export stage (DV: export intensity).

	Pre-exporters (N = 37)			Exporters (N = 59)		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	1.189	1.057	−3.372	−2.321	6.375	1.258
LnSize	0.067	0.028	−0.042	0.253	0.237	0.048
LnAge	−0.011	−0.004	0.127	0.125	−0.184	−0.018
Agriculture	−0.210	0.029	0.330	−0.025	−0.040	0.064
LoTechManufacturer	−0.059	−0.040	−0.017	0.090	−0.094	−0.093
HiTechManufacturer	−0.102	0.131	0.574 <sup>†</sup>	−0.116	−0.316	−0.120
Innovativeness	0.043	−0.050	0.133	0.033	0.170	0.105
Risk	0.135	0.095	−0.009	−0.139	−0.290 <sup>†</sup>	−0.161
Export intensity 2007	–	–	–	0.325 <sup>†</sup>	0.410	0.268 <sup>**</sup>
Export intention	0.580 <sup>**</sup>	0.158	0.104	0.293 <sup>†</sup>	0.141	0.053
Congenital KA		−0.074	0.030		−0.186	0.347
Grafted KA		−0.075	0.212		−0.197	−0.094
Experiential KA		−0.036	−0.212		0.426 <sup>+</sup>	0.239 <sup>†</sup>
Vicarious KA		0.315 <sup>†</sup>	0.420 <sup>+</sup>		0.177	−0.050
Search KA		0.487 <sup>+</sup>	0.359 <sup>†</sup>		−0.262 <sup>†</sup>	−0.150
1 age × congenital			−0.387			−0.554 <sup>+</sup>
2a grafted × search			0.336 <sup>†</sup>			0.091
2b grafted × vicarious			0.313 <sup>†</sup>			−0.082
3 search × experiential			−0.403			−0.444 <sup>**</sup>
4a intention × search			0.494 <sup>+</sup>			0.021
4b intention × vicarious			0.250 <sup>+</sup>			0.140
4c intention × experiential			−0.063			0.278 <sup>+</sup>
R <sup>2</sup> adjusted	0.090	0.253	0.599	0.077	0.416	0.810
Chi-square	0.222	0.080	0.005	0.244	0.007	0.000
Increase R <sup>2</sup>	0.292	0.230 <sup>†</sup>	0.299 <sup>+</sup>	0.284	0.336 <sup>**</sup>	0.289 <sup>***</sup>

\*\*\*  $p < .001$ .\*\*  $p < .01$ .+  $p < .05$ .†  $p < .10$ ;  $p$ -values for two-tailed test.

with the premise that greater foreign knowledge and learning activities would be associated with a more rapid pace of internationalizing. We proceeded on the assumption that the pace of internationalization may be influenced by a wider variety of knowledge and learning types than originally theorized. We sought to contribute by examining how types of knowledge and learning interact with one another, and how they are moderated by organizational age and strategic intent. We found evidence for significant knowledge-learning interaction effects on the pace of internationalization; further, we also found that the effects of congenital knowledge are moderated by the age of the firm at initial exporting activity and that the effects of vicarious learning and experiential learning are moderated by firms' strategic intentions.

The stage model of internationalization (Johanson & Vahlne, 1977, 1990) and the INV theory (Oviatt & McDougall, 1994) initially diverged in their stances on the relative importance of pre-existing foreign knowledge to the internationalization process. Eventually, evidence accumulated that founders' pre-existing knowledge did have an impact on the timing and pace of internationalizing (Johanson & Vahlne, 2009). However, because this evidence largely appeared in studies of new venture internationalization (Sapienza et al., 2006), what was not known was whether congenital knowledge would have an impact if a firm started to export at 5, 10, 15 or 20+ years of age. Our results indicate that, indeed, the effect of pre-existing knowledge is greater in younger firms than in older ones. Fig. 1 shows the exact pattern of the relationship. For the younger firms in our sample, as congenital knowledge increases there is a sharp rise in export intensity. However, for older firms there is virtually no relationship between pre-existing congenital knowledge and subsequent export intensity. It should be kept in mind that the median age of firms in our sample at the time of measurement was about 18 years. Thus, it appears that congenital knowledge continues to have an influence on export intensity for quite some time, but

eventually such influences apparently disappear. Several intriguing possibilities may explain this relationship. It may be that the validity or perceived validity of congenital foreign knowledge wanes as time passes and conditions change. It may also be that the influence or energy of the founders wanes over time. An interesting topic of future study may be to investigate what factors might alter the inflection point beyond which congenital knowledge ceases to exert an influence.

"Grafted" or "hired-in" expertise is a second type of knowledge stock mentioned in the literature as influencing the pace of internationalization. We posited that although grafted knowledge might have only limited direct effect on export intensity (i.e., limited perhaps by the fact that managers may not command the same level of influence as founders), it could significantly enhance the effects of active learning attempts such as foreign knowledge search and vicarious learning. The logic was that managers hired in with foreign experience would be more aware of and more willing to exploit opportunities to export. Hence, we expected that the greater such knowledge in the firm, the stronger would be the positive effects of search and vicarious learning activities. Our results are mixed. First of all, we find a negative relationship between grafted knowledge acquisition and future export intensity. This result may suggest that expatriates with prior international experience may have had negative outcomes and discouraged the company from increasing exports. Another potential explanation for this result is that firms might prefer other entry modes (e.g. joint ventures) once they have acquired more international knowledge. Grafted knowledge has a positive, significant interaction effect with search; however, the interaction with vicarious learning is positive but not quite significant. Furthermore, an inspection of Fig. 2 shows that the pattern is not exactly what we envisioned. We had expected that higher levels of grafted knowledge would be followed by higher levels of export intensity, as search activities increased. This figure shows that while there is a very slight rise in export intensity as search

increases for firms with more grafted knowledge, the interaction effect is created by the fact that those firms with *little* grafted knowledge have less and less export intensity as search rises.

What is going on? One possibility is that if a firm searches, it may not like what it finds (March, 1981). Our study was conducted in Spain during a time when neither its economy nor the economies of its neighbors was particularly strong. It would not be surprising to think that under such conditions firms lacking managers with foreign experience might find venturing abroad particularly risky. A measurement issue might provide another possible explanation for the weak overall results for our grafted knowledge variable. We measured how much grafted knowledge the firm possessed, but we do not know when this grafted knowledge was added to the firm. If, like the congenital knowledge of the founders, the potency of grafted knowledge decays over time, we may have failed to detect actual effects of newly-added grafted knowledge because lack of effects of “obsolete” grafted knowledge could have masked effects.

In our view, one of the most interesting interactions to examine is that between experiential knowledge and search because these are at opposite ends of the tacit-explicit and unintentional-intentional learning spectrums and because the former has been touted as essential in some models while the latter has been relatively forgotten. In Hypothesis 3, consistent with stage theory thinking, we had posited that as experiential learning grows, the effects of search on actual export intensity diminish. Indeed, our results support this contention. Even more, however, Fig. 3 shows that the positive effect of search on export intensity when experiential learning is low not only disappears at high levels of experiential learning but that it becomes negative. It is not fully clear to us why the relationship becomes negative, rather than simply leveling off. What may be happening could be a form of reverse causality: perhaps the high experiential learning firms only continue to search when they are dissatisfied with their export intensity results. Such a possibility would be consistent with the behavioral theory of the firm (Cyert & March, 1963), but such a conclusion is very speculative. It should be kept in mind that export intensity was measured 3 years after search was measured.

Behavioral theory itself has made valuable contributions to our understanding of strategy processes in real firms because of its emphasis on limits to rationality and its recognition of multiple and competing objectives within firms. Nevertheless, predicting what human organizations will do should benefit from consideration of explicit strategic intentions that may supersede or direct the behavioral tendencies set in motion by current and past actions. Therefore, we posited that the strategic intentions of the top managers would moderate the effects of learning activities in shaping the international intensity of firms. Our arguments included an expectation that positive intentions to expand exporting would likely color the interpretation of information signals as the firm searched, learned vicariously, or learned from experience. Another possibility (one that we did not develop in Section 2) is that when international expansion becomes a strategically sanctioned goal, managers are more likely to pursue it. In any case, our results do indicate a significant positive moderation of the effects of two types of learning (of vicarious learning [H4b] and of experiential learning [H4c]), but we do not see evidence that strategic intention positively moderates the effects of search [H4a]. Figs. 4 and 5 show that for firms with stronger intentions to expand exporting, greater amounts of vicarious and experiential learning are associated with significantly higher levels of realized export intensity. Indeed, for those with relatively lower export aspirations, there appears to be a slight downward effect of greater levels of vicarious and experiential learning. Table 2 shows that there is a non-significant positive interaction of search and intention; these weak results

may reflect some of the mixed motives in seeking objective knowledge through search that Huber (1991) mentions. Nevertheless, our results demonstrate that taking strategic intentions into account provides useful predictive power.

The supplementary analyses we conducted by dividing our sample into the firms that had not yet commenced exporting versus those that had done so within the last year indicated that there is some evidence that the effects and patterns of learning are different in the two groups. As might be expected, search and vicarious learning had a greater future impact on export intensity in firms in the pre-exporting phase than it did for those already exporting. Yet, the descriptive statistics indicate that those already exporting are *more* active gatherers of foreign knowledge—in all three modes: search, vicarious, and experiential—than those that have yet to begin exporting. That is, they are not only gaining more experiential knowledge but also expending more energy in search and in active observation of other firms once they begin to export. Of course, we cannot infer that these two groups necessarily represent different sequential phases of the same process. Future longitudinal design will be needed to see whether the patterns seen here would also be seen in firms observed over time.

### 5.1. Limitations and future directions

Readers should bear in mind some of the limitations of our study in assessing the meaning of our study and its results. As our sample was comprised primarily of small and medium-sized businesses in manufacturing and service sectors in a single region (Andalusia, Spain), it is difficult to say exactly how broadly our results would generalize. Europe is comprised of a sophisticated network of many well-developed countries. Perhaps location farther from good export opportunities might lessen (or increase) the effects of learning on internationalization speed. Furthermore, our sample was restricted to those demonstrating an interest in exporting; we cannot say anything about how firms first become interested in exporting. Our cross-sectional design suggests caution in drawing causal inferences. Any study of learning and knowledge faces the challenge of conceptualizing and measuring the constructs. Huber's (1991) typology is appropriately broad and exhaustive, but its categories are not always mutually exclusive so that empirically drawing lines between types are difficult. We were especially cognizant of taking steps to validate our measures, but the constructs themselves are difficult to capture. And finally, the survey was completed by only one person for each firm (CEO or similar), involving a potential response bias regarding usefulness of each type of knowledge. In conclusion, however, we believe that we have added useful information to the quest to understand the internationalization of firms and that many productive future research paths may be followed that could extend or clarify what we did here.

We provided some insight into predicting how a company's internationalization may develop, but we necessarily left many paths unexplored. For instance, Levesque et al. (2009) speculated that the efficacy of ‘participation’ (i.e., direct experience) versus vicarious learning varies with circumstances. Future research could empirically explore this idea; or, it could attempt to extend Levesque et al. (2009) by theoretically developing a pertinent set of types of vicarious learning. Another important extension would be to develop theory regarding the relationships among the company's learning processes, its information distribution, its information interpretation systems, and its organizational memory as suggested by Huber (1991). Another intriguing path might be to form new theory around the revised internationalization model of Johanson and Vahlne (2009). Their repositioning of their model from a focus on foreign market knowledge to relationship knowledge changes the entire landscape for theorists who take

that work seriously. Not only are the learning objects themselves dramatically changed in terms of where and how pertinent knowledge resides and is stored, but the very nature of that knowledge and how it must be obtained and captured must also necessarily undergo dramatic revision. Additionally, future research should investigate the interplay between knowledge, learning and strategic intent when firms uses alternative modes of operation, as international alliances, joint-ventures, foreign direct investment, etc.

In focusing on a single country at a particular point in time, we controlled for interesting differences that might very well be worth exploring in their own right. Another potentially important path may be to investigate how cultural and/or economic differences across regions affect the types of learning activities engaged in, the costs associated with them, and the extent to which entities can profitably rely on experiential versus second hand learning. A related stream might also investigate the learning and economic efficacy of pursuing aggressive versus incremental internationalization strategies (Autio et al., 2000; Levesque et al., 2009; Zahra et al., 2000) in different technological, cultural, or political regimes.

## 6. Conclusion

We sought to broaden the understanding of how knowledge and learning in the period surrounding initial exporting affect the pace of internationalization. We adapted Huber's (1991) knowledge acquisition typology to conceptualize components of a firm's

foreign knowledge stock and its foreign learning activities. Among other things, we found that search for foreign objective knowledge had much less importance to export intensity when the firm was engaging in high levels of experiential learning; interestingly, we also found that vicarious learning was much more strongly associated with export intensity when experiential learning was high. We also examined how organizational age and organizational intentions served as moderators to the effects of learning, finding that (1) although pre-existing (congenital) knowledge of the firm's founders does influence the pace of internationalization for firms that start young, such effects do not appear to exist for firms starting export much later in their histories; and (2) the effects of learning activities on export intensity are conditioned by the strategic intentions of the firm. Specifically, higher levels of vicarious and experiential foreign learning are associated with a dramatic increase in export intensity when strategic interest in exporting is high; however, when high levels of vicarious and experiential foreign learning are accompanied by low levels of interest in exporting, the result is actually a decrease in export intensity.

In summary, our study extends work on the role of learning in the internationalization process, providing some new insights into how the process commences and unfolds. While our results confirm and extend much prior thinking, we conclude that there is much yet to learn, and we have provided a brief agenda for doing so. We hope that this work will inspire other researchers to take up the challenge.

## Appendix I. Factor analysis of knowledge and learning items

Items	Questions <sup>a</sup>	1	2	3	4	5
Congenital 1	Founder(s) worked for a multinational	0.789	0.063	0.029	0.192	0.010
Congenital 2	Founder(s) worked for an export company	0.797	0.116	0.224	0.053	0.079
Congenital 3	Founder(s) obtained degrees or studied abroad	0.863	0.138	-0.012	0.089	0.081
Congenital 4	Founder(s) participated in international cooperation networks	0.854	0.205	0.114	0.040	0.056
Congenital 5	Founder(s) studied foreign language(s)	0.746	0.338	0.026	-0.081	0.228
Grafted 1	Hired managers worked for one or more multinational companies	0.081	0.807	0.307	0.189	0.122
Grafted 2	Hired managers worked for companies with large international networks	0.215	0.857	0.148	0.046	0.058
Grafted 3	Hired managers obtained degrees or studied abroad	0.200	0.864	0.208	0.129	0.079
Grafted 4	Hired managers studied foreign language(s)	0.252	0.884	0.053	0.026	0.099
Experiential 1	The company engages in a variety of international activities	0.202	0.233	0.753	0.080	0.253
Experiential 2	The company is regularly involved in activities related to other exporters	0.011	0.113	0.880	0.163	0.198
Experiential 3	The company interacts with many foreign clients	0.106	0.266	0.802	0.140	0.107
Vicarious 1	The company interacts with foreign competitors who have started international expansion	0.101	0.012	0.184	0.838	0.208
Vicarious 2	The company interacts with domestic competitors who have started international expansion	0.086	0.140	0.080	0.881	0.094
Vicarious 3	The company pays close attention to companies that are growing internationally	0.076	0.150	0.115	0.764	0.329
Search 1	The company continuously searches for information on specific countries	0.087	0.053	0.125	0.244	0.923
Search 2	The company continuously searches for information on potential international markets	0.096	0.092	0.177	0.217	0.891
Search 3	The company continuously searches for information on potential partners in some countries	0.155	0.166	0.258	0.156	0.800

<sup>a</sup> All items asked the extent to which the respondent agreed with the statements (1 = totally disagree to 7 = totally agree).

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