

Differences in Entrepreneurial Opportunities: The Role of Tacitness and Codification in Opportunity Identification*

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The role of opportunities in the entrepreneurial process remains relatively underdeveloped. To address this issue, we develop a definition of an entrepreneurial opportunity and draw upon a distinction from the domain of knowledge management to suggest a continuum of entrepreneurial opportunities ranging from codified to tacit. Though both traditional and contemporary research has examined how individual differences relate to the identification of opportunities, we focus instead on the importance of differences in the opportunities themselves. Specifically, we examine how relative differences in the degree of opportunity tacitness relate to the process of opportunity identification. We find that relatively more codified opportunities are more likely to be discovered through systematic search, whereas more tacit opportunities are more likely to be identified due to prior experience. These findings contribute to an increased understanding of the role of the opportunity in entrepreneurship research and have important implications for economic theories of entrepreneurship, entrepreneurial learning, entrepreneurial networks, and entrepreneurial education.

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Introduction

How are opportunities identified? One of the central questions in the field of entrepreneurship has focused on the identification of opportunities. The identification of opportunities is important in part because it is often the first step in the entrepreneurial process (Baron and Shane 2005). Historically, this line of inquiry has sought to understand why some people, and not others, identify entrepreneurial opportunities (Shane and Venkataraman 2000). This approach has led to a great deal of research attempting to specify how individual differences allow certain people to identify entrepreneurial opportunities. For example, early research in the field sought to address this question partly through a trait-based approach (e.g., McClelland 1961). More recently, the resurgence of an individual difference approach to entrepreneurship research has taken on a more cognitive approach, highlighting the role of cognitive decision-making (Busenitz and Barney 1997) and pattern matching (Baron and Ensley 2006) used by entrepreneurs to identify opportunities.

Whereas person-centric approaches have contributed much to the field of entrepreneurship, the domain of the field has been respecified to include two phenomena: the aforementioned presence of enterprising individuals and the presence of entrepreneurial opportunities (Venkataraman 1997). The reconceptualization of the field of entrepreneurship as an individual–opportunity (I–O) nexus calls for increasing attention of the role of entrepreneurial opportunities and how these entrepreneurial opportunities may affect the entrepreneurial process. Responding to this call, research related to entrepreneurial opportunities and opportunity identification is increasing. For example, recent research suggests opportunity insights are directly related to opportunity identification experiences (Corbett 2005) and the match of learning

style demanded by a given situation (Dimov 2007). Studies also suggest that though women and men utilize their unique stocks of human capital to identify opportunities, they use fundamentally different processes of opportunity identification (DeTienne and Chandler 2007).

While research is continuing to develop, much of this work in the area of opportunity identification remains focused on the importance of individual differences with respect to opportunities. By contrast, we focus on the importance of relative differences in opportunities, not individuals. This distinction is important because “variation in opportunities themselves can account for at least some of the observed patterns in entrepreneurial activity” (Shane 2003, p. 18).

The idea that opportunities may differ on various dimensions is not entirely new. A comparison of early research draws attention to the idea that opportunities may differ on such important dimensions as their expected value and innovativeness. For example, differences have been identified between Schumpeterian (i.e., those that are mainly innovative in nature) opportunities and Kirznerian (i.e., those that are discovery driven in nature) opportunities (for a full review of this distinction, see Shane 2003). Although this work is frequently and broadly acknowledged in current research, scholars have noted that relatively less work has examined how these differences may affect the entrepreneurial process.

In this article, we seek to extend the growing line of research that emphasizes a more prominent role of the entrepreneurial opportunity (e.g., Dimov 2007; Plummer, Haynie, and Godesiabois 2007; Corbett 2005; Shane and Venkataraman 2000) by focusing on relative differences in opportunity types. Specifically, we borrow from the domain of knowledge management to draw on the distinction between the degrees of tacitness of entrepreneurial opportunities. Whereas some

theorists have suggested that relatively codified opportunities or neat packages should be excluded from the domain of entrepreneurship (Shane 2003; Venkataraman 1997), we believe a more inclusive view of entrepreneurial opportunities may open the door for a greater understanding of both entrepreneurial opportunities and the entrepreneurial process. Accordingly, we draw upon the distinction between codification and tacitness to argue that the nature of the opportunity may be related to the process of opportunity identification (systematic search versus discovery) and the role of prior knowledge in the process. In so doing, we begin to shed light on how the attributes of the opportunity itself may affect the entrepreneurial process, and we contribute to the relatively limited empirical work that has accounted for variance in the opportunities.

This article will proceed as follows. First, we provide a review of the literature on entrepreneurial opportunities to develop a more inclusive definition of an entrepreneurial opportunity and to demarcate the attributes of the opportunity and the attributes of the individual. Second, the distinction between tacitness and codification is introduced and defined as an attribute of the opportunity. Third, drawing upon this distinction, we develop a typology and present hypotheses about how the degree of tacitness of the opportunity may be related to the process through which the opportunity is identified and the role of prior knowledge. Fourth, we discuss the findings of this study and its implications for economic theories of entrepreneurship, entrepreneurial learning, entrepreneurial networks, and entrepreneurial education.

Theoretical Background

Defining an Entrepreneurial Opportunity

What is an entrepreneurial opportunity? As the role of an entrepreneurial opportunity becomes increasingly impor-

tant, there continues to be a lack of clarity about its definition. Shane and Venkataraman (2000, p. 220) defined an entrepreneurial opportunity as “those situations in which new goods, services, raw materials, and organizing methods can be introduced and sold at greater than their cost of production.” To differentiate entrepreneurial opportunities from all other profit opportunities, the authors required the discovery of “new means–ends relationships.” Though this definition has been adopted by some scholars and even used as the starting point for a special issue on entrepreneurial opportunities in *Small Business Economics*, questions exist about the utility and comprehensiveness of this definition.

Scholars have suggested “the language of ‘new means–ends’ framework in particular leads to easy confusion and the confounding of ideas” (Plummer, Haynie, and Godesiabois 2007, p. 366). To illustrate this point, these authors used the example of Dell Computer’s origin to point out that under the *new means–ends* definition, Michael Dell would *not* have been exploiting an entrepreneurial opportunity, “since the manufacture and sale of personal computers was a well-established economic activity at the time Dell started his venture” (Plummer, Haynie, and Godesiabois 2007, p. 366). As a result, Plummer and his colleagues suggest the differentiation between objectively new and underexploited opportunities is one of the central challenges of developing theory and research about entrepreneurial opportunities.

In an effort to accommodate underexploited situations, Singh (2001) defined an entrepreneurial opportunity as “a feasible, profit-seeking potential venture that provides an innovative new product or service to the market, improves on an existing product/service, or imitates a profitable product/service in a less-than-saturated market” (Singh 2001, p. 11).

This definition, adopted by others (e.g., DeTienne and Chandler 2007), broadens the understanding of an entrepreneurial opportunity beyond “objectively new” means–ends frameworks.

Yet in a rebuttal to this definition, Shane and Venkataraman (2001) suggest that even this definition may be too narrow on several fronts. First, these authors argue that an entrepreneurial opportunity does not have to be exploited by a new venture. As such, they argue for the removal of this language and the expansion of a definition to include a range of methods to exploit. Second, they suggest that Singh’s definition is restricted to products and services and fails to include new organizing methods and new raw materials. Therefore, they suggest that an expansion of the definition to include these forms of opportunity is necessary. Finally, they contend that the definition needs to be expanded to include any market inefficiency due to information asymmetry. In sum, rather than objecting to Singh’s attempt to broadening previous definitions, these authors actually argue for a still larger expansion of the definition of an entrepreneurial opportunity.

The discussion above illustrates the complexity and challenge of establishing interdisciplinary consensus on how an entrepreneurial opportunity *should be* defined. It also suggests that rather than seeking such consensus where consensus may not be possible, “it may be far more important for scholars to simply take a stance on this issue and then clearly articulate their position and definition of what is and is not opportunity” (McMullen, Plummer, and Acs 2007, p. 279). We agree that this may indeed be the most important step to advancing extant theory. Accordingly, we now turn attention toward articulating the definition of an entrepreneurial opportunity utilized in this study by drawing upon the exchange between Singh (2001) and Shane and Venkataraman (2001).

Following the extant work of previous theorists, we begin first with the notion that opportunities are “objective” phenomena in that there is “always an opportunity to do *something*,” and are, therefore, a “means” to an end (McMullen, Plummer, and Acs 2007, p. 277). We define an entrepreneurial opportunity more specifically as a feasible profit-seeking situation to exploit a market inefficiency that provides an innovative, improved or imitated product, service, raw material, or organizing method in a less-than-saturated market. The purpose of this definition is to accommodate a broader view of entrepreneurial opportunities that moves beyond the new means–ends language, includes raw materials and organizing methods, and allows for entrepreneurial efforts that focus on adding value by addressing market inefficiencies.

Conceptualization of the opportunity recognition process has shifted toward an I–O nexus perspective in recent years (Shane and Eckhardt 2003). From such a perspective, the role of the opportunity takes on increasing importance in the extension and development of our current understanding of entrepreneurship. In particular, expanding some prior conceptions of an entrepreneurial opportunity to include underexploited opportunities suggests that there is likely to be substantial variance within the overall set of entrepreneurial opportunities. Thus, coupling a more prominent role of opportunities and the increased variance in opportunities implies that “one might expect that some theories of entrepreneurship, and their normative prescriptions, would need revision” (Plummer, Haynie, and Godesiabois 2007, p. 376).

Another implication of such a shift is that it becomes increasingly important to be able to delineate the attributes of the individual from the attributes of the opportunity in order to avoid confounding the role of each in theory and empirical research (Shane and Venkataraman

2000). As such, an important definitional issue in the case of entrepreneurial opportunities is the distinction between knowledge (an attribute of the individual) and information (an attribute of the opportunity).

Though some schools of thought, such as the classical approach of economics, consider knowledge and information to be interchangeable terms (e.g., Ancori, Bureth, and Cohendet 2000), Boulding (1953) suggested

We cannot regard knowledge as simply the accumulation of information in a stockpile, even though all the messages that are received by the brain may leave some deposit here. Knowledge must itself be regarded as a structure, a very complex and quite loose pattern with its parts connected in various ways by ties of varying degrees of strength.

Knowledge is an attribute of the individual that involves a cognitive process for acquisition. Knowledge is structured and coherent. By comparison, information is independent of the individual. Information can stand alone; it is fragmented and transitory (Ancori, Bureth, and Cohendet 2000). Summarizing the difference between information and knowledge, Machlup (1983) suggested, “[e]ven in everyday parlance people sense a difference that can be seen from the fact that at railroad stations, airports, department stores and large public buildings we expect to find a booth or counter marked ‘Information’ but never one marked ‘Knowledge.’”

In this study, we draw on the distinction between knowledge and information to define further an entrepreneurial opportunity as a piece or collection of information related to the aforemen-

tioned feasible profit-seeking market inefficiency. We believe this distinction is important to advancing the study of opportunity because though knowledge may be used by the individual to combine information, it is not necessary for the opportunity to exist. Thus, the present definition allows for the separation of the attribute of the individual (knowledge) from the attribute of the opportunity (information).

In this article, we argue that the process of opportunity identification may differ based upon the relative differences of the entrepreneurial opportunities in question. Specifically, we draw upon the distinction between tacitness and codification to suggest that the nature of the opportunity (i.e., its degree of tacitness) may affect whether the opportunity is identified through a process of systematic search or discovery and the importance of prior knowledge.

This typology suggests that different types of opportunities will be identified through different types of opportunity identification processes. The top half of the diagram considers relatively more tacit opportunities and suggests that if an opportunity is tacit, then the opportunity may either be identified through the discovery process, or utterly overlooked. The relative tacitness of the opportunity obscures the opportunity from prospective entrepreneurs and makes it more difficult to identify.¹ However, when armed with prior knowledge (Shane 2000), a prospective entrepreneur is more likely to overcome the challenges inherent in recognizing a tacit opportunity, and therefore identify the opportunity. This view is consistent with the Austrian economic view of the entrepreneur.

Conversely, the bottom half of the matrix considers relatively more codified opportunities and suggests that the sys-

¹We thank an anonymous reviewer for clarifying this point.

tematic search for such opportunities is possible, as advanced in psychological and informational economic theories. The reason search is possible is because the explicit nature or relative codification of the opportunity allows the entrepreneur to engage in a search and comparison between different “neat packages” of entrepreneurial opportunities. In this case, the relative codification of the opportunity attenuates the utility of prior knowledge because the explicit nature of the opportunity manifests itself more readily to prospective entrepreneurs. As such, the level of difficulty in identifying a relatively more codified opportunity is reduced. To further explain how the nature of the opportunity may affect the opportunity identification process, we first turn to an explanation of role of tacitness.

The Tacit Distinction

In the domain of knowledge management, the nature of knowledge has been distinguished by the degree to which the knowledge is tacit or codified. The codification of knowledge, with reference to codes, relates to the degree to which knowledge is able to be made explicit or documented primarily through codes (Cowan, David, and Foray 2000). Knowledge is codified to the extent that it can be articulated or transmitted in formal, symbolic language. As such, one can draw the conclusion that everything that is articulable is codifiable, and that everything that has been articulated is actually codified (Johnson, Lorenz, and Lundvall 2002).

By comparison, tacit knowledge tends to be context specific, more challenging to articulate, and represented by the absence of agreed upon language. Polanyi (1966, p. 4) introduced the concept of tacit knowledge by suggesting, “I shall reconsider human knowledge by starting from the fact that we know more than we can tell.” In reviewing the literature on tacit knowledge,

Ambrosini and Bowman (2001) identified four characteristics of tacit knowledge. First, tacit knowledge is difficult to write down or to formalize. Second, tacit knowledge is personal knowledge and often difficult for the knower to communicate to others. Third, tacit knowledge is practical and describes a process. It has often been referred to as know-how (Kogut and Zander 1992). Finally, tacit knowledge is context specific and is often acquired on the job.

The importance of tacit knowledge rests on the issue that its inarticulable nature makes it difficult to imitate, and therefore may be an asset that leads to a competitive advantage (Kogut and Zander 1992). However, though potential benefits may exist, the tacitness of knowledge also contributes to some challenges, suggesting that the degree of tacitness may result in a contingent relationship. For example, in a study of 120 new product development projects within 41 divisions of a large electronics company, Hansen (1999) found tacit and codified knowledge affected differentially the search and transfer of knowledge within the firm. Specifically, he found that both weak and strong network ties have relative strengths and weaknesses for the search and transfer of knowledge. The “net effect on project completion time of having either weak or strong inter-unit ties is contingent on the complexity of the knowledge to be transferred across the sub-units” (Hansen 1999, p. 105). Weak ties facilitated the search for knowledge, but impeded knowledge transfer when the knowledge was tacit. Strong ties limited the search for knowledge, but improved the transfer of tacit knowledge between subunits. As such, this study provides evidence that the utility of knowledge is contingent upon its degree of tacitness. Having identified how the degree of tacitness may affect knowledge processes, we now turn to see how the nature of tacitness may also be related to

contingent relationships in entrepreneurial processes.

Tacit and Codified Opportunities

Although the tacit distinction has typically been applied to individual and organizational knowledge, we believe that it is also possible to use the same distinction to advance our current understanding of entrepreneurial opportunities. We borrow the distinction of tacitness and codification and apply it not as an attribute of knowledge of the entrepreneur, but rather as *an attribute of an entrepreneurial opportunity*. Specifically, we propose that there are *two different types of opportunities—codified and tacit*²—and that the type of opportunity influences the identification of the opportunity.

A *codified opportunity* is well-documented, articulated or communicated profit-seeking situation in which a person seeks to exploit market inefficiency in a less-than-saturated market. The documented and articulated nature of the opportunity suggests a codified opportunity is more likely to focus on imitated or moderate improvements of products, services, raw materials, or organizing methods. By comparison, a *tacit opportunity* is a profit-seeking situation that is difficult to codify, articulate or communicate, in which a person seeks to exploit market inefficiency in a less-than-saturated market.³ In the case of tacit opportunities, the inarticulable nature of the opportunity is likely to focus on major improvements or new innovations of products, services, raw materials, or organizing methods. In

addition, the market is likely to be severely underexploited or completely new (i.e., previously non-existent). Having defined tacit and codified opportunities, we now turn our attention toward developing hypotheses about how the degree of tacitness may be related to the opportunity identification process.

Systematic Search versus Discovery of Entrepreneurial Opportunities

In the extant literature, two different processes have been postulated as paths to the identification of an entrepreneurial opportunity—systematic search and discovery (for a thorough review of these processes, see Shane [2000]). In the case of systematic search, prospective entrepreneurs intentionally seek out or search for exploitable venture ideas (Shaver and Scott 1991). This model, based upon informational economics, suggests entrepreneurs will search to the extent that the marginal benefits gained by the search exceed the marginal costs of conducting the search (Stigler 1961). Implicit in the search model is the assumption that the object of the search is readily identifiable. In contrast to systematic search, Austrian economists have argued in favor of a discovery process of opportunity recognition. From this perspective, an “opportunity for pure profit, by its nature, cannot be the object of systematic search” (Kirzner 1997) because it is “unknown until it is discovered” (Kaish and Gilad 1991).

Though these two views of entrepreneurial opportunity identification appear to contradict one another, it may be pos-

²It should be noted that the distinction between codified and tacit opportunities represent two anchor points on a continuum rather than a dichotomy. Rather than existing as mutually exclusive categories, these two forms of opportunities—codified and tacit—exist along a continuum ranging from a low to a high *degree of tacitness* (for a similar argument of the nature of knowledge, see Ambrosini and Bowman [2001]).

³Tacit opportunities are likely to become more codified through the passage of time. The more codified the opportunity becomes, the lower the entrepreneurial rents that are likely to be gained through the exploitation of the opportunity (Shane 2003).

sible to reconcile these views by examining the nature of the opportunity. That is, the two views of opportunity identification may not be contradictory because they may be referring, in part, to different types of entrepreneurial opportunities. One of the key points of differentiation between the search and discovery models is how well articulated is the object of the search (i.e., the opportunity). When the opportunity is relatively more codified, as in the case of imitated or moderate improvements to existing products, services, raw materials, or organizing methods, the articulable nature of the opportunity facilitates the ability of the entrepreneur to conduct a search for the opportunity. That is, the systematic search of opportunities is more likely to occur when the opportunity is relatively more codified, because the articulable nature of the opportunity facilitates the search process.

By contrast, in the case of tacit opportunities (Shane 2000), we concur with the discovery process offered by Austrian economists. When an opportunity is relatively more tacit, as in the case of major improvements or new innovations of products, services, raw materials, or organizing methods, the search for the opportunity is, at best, challenging, because it is difficult to search for something that is hidden (Polanyi 1966) or utterly overlooked (Kirzner 1997). As a result, we argue that the process of opportunity identification is contingent upon the nature or type of entrepreneurial opportunity; different types of opportunities are related with different identification processes. This argument leads to our first hypothesis.

H1: The degree of tacitness of an opportunity is inversely related to systematic search.

Role of Prior Knowledge

The role of prior knowledge has been identified as an important individual dif-

ference in the identification of entrepreneurial opportunities. As such, we begin to examine how the role of prior knowledge relates to the opportunity type within the context of the broader opportunity identification process. As suggested in the extant literature, prior knowledge creates a knowledge corridor that allows people to recognize certain opportunities (Venkataraman 1997; Hayek 1945). Through qualitative research, Shane (2000) provided evidence that people's prior knowledge of markets, how to serve markets, and customer problems were related to the opportunities that they identified. Though this work provides some evidence to understand why some people identify certain opportunities but not other opportunities, we believe the findings can be extended by drawing on our more inclusive definition of an entrepreneurial opportunity.

The case study approach employed by Shane (2000) relied exclusively on novel, technological opportunities to examine the role of prior knowledge. The theoretical sample used in this research did not include relatively more codified opportunities given his use of a more restrictive definition of an entrepreneurial opportunity as a new means-ends relationship. As a result, the findings may not generalize to the population of all opportunities described in the more inclusive definition of entrepreneurial opportunities. More importantly, given the preoccupation with the innovation in the domain of entrepreneurship (Baumol 1993), such sampling exclusions are likely to be rather common in many empirical studies, including those that examine how prior knowledge affects the entrepreneurial process. As such, we know very little about how the role of prior knowledge varies across different types of opportunities.

Relying again on the distinction between tacit and codified opportunities, we suggest that the utility of prior knowl-

edge in opportunity identification will be contingent on the nature of the opportunity. This is because knowledge obtained through prior industry work experience allows one to add to the stocks of knowledge in a specific domain. This type of domain-specific knowledge, often referred to as know-how or tacit knowledge (Cowan, David, and Foray 2000), allows some people to identify previously unarticulated and undocumented opportunities within those domains. Though relatively more tacit opportunities are generally more difficult to identify, the prior knowledge gained through industry experience reduces the level of difficulty of opportunity identification for those possessing such knowledge. However, in the case of codified opportunities, the explicit nature of the opportunity reduces the necessity of such tacit knowledge to create the knowledge corridor to identify the opportunity. For relatively more codified opportunities, the benefit of prior knowledge gained through industry experience is less useful in the identification of the opportunity, as the opportunity is already well documented and available. The explicit nature of the codified opportunity reduces the level of difficulty of recognizing the opportunity and allows it to be identified by a larger number of prospective entrepreneurs. Therefore, we expect that the role of prior knowledge will have a contingent relationship with type of entrepreneurial opportunity. This argument leads to our second hypothesis.

H2: The degree of tacitness of an opportunity is positively related to prior knowledge.

Methods

Sample and Data Collection

We drew on archival data from the Panel Study of Entrepreneurial Dynamics (PSED). The PSED database was specifically developed and designed by the

Entrepreneurial Research Consortium (ERC) to address questions related to nascent entrepreneurial activity (see Reynolds [2000] for an extended review of this database's development and content). Because the PSED sample is nationally representative, it provides an excellent means of examining a large cross-section of entrepreneurial opportunities that may vary on their degree of tacitness.

Variables

Degree of Opportunity Tacitness. The difficulty in measuring different types of opportunities required the use of proxies. We used items from PSED to operationalize the variable of degree of opportunity tacitness. Because no single item fully captured the construct of tacitness of the opportunity, we used three items to construct a *formative index* of opportunity type. The primary difference between reflective and formative indicators is the direction of causation. In the case of reflective indicators, the observable indicators are assumed to represent or reflect the construct. This means that the construct should be unidimensional and the items correlated (Helm 2005). As such, an increase in one indicator is associated with increases of the other indicators (Chin and Newsted 1999). By comparison, formative indicators "cause" the latent variable and represent different dimensions of the variable (Helm 2005). The latent construct reflects a summative index of the observed variables. The indicators need not be correlated nor represent the same underlying dimension (Bollen and Lennox 1991).

The degree of tacitness index consisted of three items addressing the type of business, the availability of information, and duration of the opportunity. The first item asked respondents to identify whether the business was an independent business, a franchise, or a purchase of existing business, a corporate-supported business, or

unknown. If the business was an independent business, it was coded 1 for tacit. If the business was a franchise or the purchase of an existing business, it was coded 0 for codified. Corporate sponsored and unknown responses were eliminated. Though it is possible that an independent business may also be the replication of an existing business, a more inclusive definition of entrepreneurial opportunities includes these as underexploited opportunities. Although the independent start-up of an underexploited opportunity may not be substantially novel, the creation of an independent business is relatively more likely to be tacit than either a franchise or existing business. The second item asked respondents whether the information used in recognizing the business opportunity was widely available. Information that is more codified is likely to be more broadly disseminated because of the ease of dissemination. As such, the distribution of information is an important attribute in the tacitness of the opportunity. If the information was *not* widely available, it was coded 1 for tacit. Otherwise, it was coded 0 for codified. The third item asked respondents about the future availability of the opportunity. The future availability of the opportunity speaks to the extent to which the opportunity has been “used up” (Plummer, Haynie, and Godesiabois 2007). This item was used as a measure of the documented nature of the opportunity, because the more documented the opportunity, the more likely it would not be available in the future, because people would have already exploited the opportunity. This variable was scored on a five-point scale (1 = completely disagree to 5 = completely agree). Opportunities where the respondent either agreed or completely agreed were coded as 1 for tacit; otherwise, it was coded 0. Following the coding of each of the three items, we added the scores of the three items to create a continuous variable

ranging from 0 (codified) to 3 (tacit), with higher scores indicating a greater degree of tacitness.

Systematic Search. We used continuous responses (1 = completely disagree to 5 = completely agree) to the item “I have engaged in a deliberate, systematic search for an idea for a new business” as the measure of systematic search. As such, higher scores indicated a search process occurred.

Prior Knowledge. We used responses (1 = checked; 0 = not checked) to the following item, “Which of the following led to your business idea? My experience in a particular industry or market,” as the measure of prior knowledge in the identification of the opportunity. As such, a dichotomous variable was created with higher scores, indicating that prior knowledge was an important factor in the identification of the opportunity.

Results

We present the descriptive statistics and regression models in Tables 1 and 2, respectively. Table 1 presents the correlations, means, and standard deviations.

H1 predicts that the degree of tacitness of the opportunity will be inversely related to systematic search. To examine H1, we regressed systematic search on the degree of tacitness of the opportunity. Consistent with H1 (see model 1 of Table 2), the coefficient for systematic search was a significant negative predictor ($b = -0.17$; $p < .01$) of opportunity tacitness. Thus, higher levels of systematic search were associated with the identification of relatively more codified (rather than tacit) opportunities.

Our second hypothesis predicts that prior knowledge will be positively related to opportunity tacitness. To examine this hypothesis, we added the variable of prior knowledge to the regression equation. The findings presented in model 2 of Table 2 show that

Table 1
Correlations, Means, and Standard Deviations

| | Mean | Standard Deviation | 1 | 2 |
|----------------------------------|------|-----------------------|---------|-------|
| 1. Opportunity type ^a | 1.78 | 0.75 | | |
| 2. Systematic search | 2.81 | 1.37 | -0.17** | |
| 3. Prior knowledge | 0.54 | 0.50 | 0.17** | -0.03 |

^aFor opportunity type, higher values indicate a greater degree of tacitness; $n = 285$.

* $p \leq .05$ (two-tailed)

** $p \leq .01$ (two-tailed)

Table 2
**Results of Hierarchical
Regression Analysis for
Degree of Opportunity
Tacitness**

| Variables | Model 1 | Model 2 |
|-------------------|---------|---------|
| Constant | | |
| Systematic Search | -0.17** | -0.16** |
| Prior Knowledge | | 0.17** |
| ΔR^2 | 0.03** | 0.03** |
| Total R^2 | 0.03** | 0.06*** |

* $p \leq .05$ (two-tailed)

** $p \leq .01$ (two-tailed)

*** $p \leq .001$ (two-tailed)

prior knowledge is positive and significant when regressed on opportunity tacitness ($b = 0.17$; $p < .01$). These findings support H2, providing evidence that the role of prior industry experience is significantly related to the identification of relatively more tacit opportunities.

Discussion

Research in the entrepreneurship literature has increasingly recognized the role of opportunity in the entrepreneur-

ial process. The current study makes important contributions to the literature on entrepreneurial opportunities and opportunity identification by providing an exploratory look into the role of tacitness and codification of entrepreneurial opportunities. The present findings provide theoretical and preliminary empirical evidence that opportunity type is an important contingency in the opportunity identification process specifically as it relates to systematic search and the role of prior knowledge. As suggested by previous research advocating for a paradigmatic shift of the field toward an I-O nexus perspective, this research takes a step toward a greater understanding the I-O nexus by addressing more explicitly the variance in the opportunity. As such, this research makes several contributions that have important implications for the field of entrepreneurship.

Perhaps the broadest contribution of this investigation to the field of entrepreneurship is that it extends previous efforts at defining an entrepreneurial opportunity, thereby resulting in a more inclusive definition. Specifically, this research draws on prior and more recent research efforts that introduce the notion of under or imperfect exploitation of entrepreneurial opportunities (Plummer,

Figure 1

Opportunity Identification: An I-O Nexus Approach

| | | Entrepreneur's Knowledge | |
|-------------------------|----------|--------------------------|--------------------|
| | | Prior Knowledge | No Prior Knowledge |
| Opportunity (Attribute) | Tacit | Discovery | Overlooked |
| | Codified | Focused Search | Systematic Search |

Haynie, and Godesiabois 2007). It illustrates that opportunities whose origins are derived from less than or incomplete prior exploitation efforts represent an important theoretical dimension of the opportunity construct. As such, this research provides an explanation for how extant entrepreneurship theorizing has been incomplete, and thus, how it might be further extended in the future.

At a more specific level, this research has important implications for current theoretical debates in the entrepreneurship literature. For example, this research begins to open the black box of the opportunity identification process by highlighting how variance in the characteristics of an opportunity may affect the process(es) through which opportunities are identified and subsequently developed. In this research, we developed a typology (see Figure 1) that integrates opportunity type, the role of prior experience, and the entrepreneurial discovery process. As suggested, this typology provides a means of reconciling the theoretical perspectives of systematic search and discovery that may otherwise be viewed as competing. Recent theoretical work on search and discovery processes of opportunity identification suggests much more work lies ahead. In developing a model of constrained systematic search, Fiet (2007) argued that entrepreneurs are

not searching for a particular idea or opportunity, but rather only for known information channels. Our current research challenges this idea by arguing that entrepreneurs may in fact search for opportunities when those opportunities are codified. As such, future theories about the search and discovery of entrepreneurial opportunities may need to be expanded to accommodate both tacit and codified opportunities.

This research also has important implications for increasing our knowledge about the I-O nexus. In the past, questions have been raised about the utility and validity of research focused on the individual entrepreneur (e.g., Gartner 1990). The results of this study suggest that the relatively limited success of this line of research may be due in part to the myopic focus on the entrepreneur and the failure to measure and account for variance in the opportunity itself. "Empirical support (or lack of support) for attributes that differentiate entrepreneurs from other members of society is often questionable, because these attributes confound the influence of opportunities and individuals" (Shane and Venkataraman 2000, p. 218). In this research, we find evidence in support of this argument that the entrepreneurial opportunity also plays a significant role in the entrepreneurial process. Accord-

ingly, this research provides an important foundation for future research to begin to develop greater specification of how the attributes of the opportunity and the attributes of the entrepreneur may relate.

Two examples may help illustrate how new lines of inquiry and greater knowledge specification may be possible by the inclusion of both individual and opportunity attributes. The first example focuses on tolerance for ambiguity (Budner 1962). Though the tolerance for ambiguity has been found to differentiate entrepreneurs from nonentrepreneurs, the explanatory power of this variable has been relatively low. Yet a more-fine grained understanding of the tolerance for ambiguity may be possible when combining this individual attribute with the opportunity attribute of tacitness or codification. For example, in the extant literature, a prospective entrepreneur may be differentiated from a nonentrepreneur based upon their relatively higher tolerance for ambiguity. What then explains why some people with relatively low tolerance for ambiguity also becoming entrepreneurs? One possible explanation is that an individual with a lower tolerance for ambiguity may be more likely to become an entrepreneur when the opportunity is relatively more codified. That is, the codified nature of the opportunity reduces some of the ambiguity encompassed within the entrepreneurial process. This example suggests how future research could develop a better understanding of how individual level variables (e.g., risk taking propensity, need for achievement, and locus of control) may be related to attributes of the opportunity (e.g., degree of codification, level of innovativeness, projected expense value).

A second example highlights how individual and opportunity attributes may provide greater insight into the opportunity identification process. Recent work (Barbosa, Kickul, and Liao-

Troth 2007) has resurrected Dickson and Gaglianano's multidimensional nature of entrepreneurial risk: the risk of sinking the boat (failure) and risk of missing the boat (missing out on a good opportunity). Combining these dimensions of risk perception with different types of opportunities, it is likely that the type of perceived risk and the type of entrepreneurial opportunity may be related. For example, it may well be that the risk of sinking the boat (failure) is reduced by pursuing a relatively more codified opportunity. Though we did not explore the relationship between opportunity type and risk, our typology suggests that a codified opportunity should theoretically represent a lower degree of risk given its clearly articulated nature.

Knight (1921) distinguished between risk (where the probability distribution of outcomes could be calculated) and uncertainty (where the distribution of outcomes was unknowable). Employing this Knightian distinction between risk and uncertainty, it is likely that a codified opportunity lends itself more to a calculation of probable outcomes due to the clear articulation of the opportunity. By comparison, a tacit opportunity involves a greater degree of risk because time, effort, and money must be invested before the distribution of returns is known (Venkataraman 1997; Knight 1921). However, though the risk of sinking the boat may be reduced with codified opportunities, the risk of missing the boat may increase. If an opportunity is more codified, it is also available for a greater number of prospective entrepreneurs to exploit. Therefore, the window of opportunity for a codified opportunity may be shorter than for a tacit opportunity, because there is less information asymmetry. Rather than unique knowledge being possessed by only certain individuals, the information about a codified opportunity may be known by and widely available to a larger number of individuals. As a result,

the length of time an opportunity will be available to any individual is relatively shorter for codified opportunities than for tacit opportunities. Therefore, more research is needed to understand how the nature of and the mechanisms for opportunity transitions from tacit to codified occur over time, and how trade-offs are made between expected value and risk based on opportunity type in order to extend the current state of entrepreneurship theory.

Beyond the mere attributes of individuals, the current research may also contribute to a greater understanding of opportunity identification processes themselves by allowing the mapping of identification processes onto different opportunity types. Chandler, Lyon, and DeTienne (2005) suggested four processes by which opportunities are identified: (1) learn/replicate, (2) learn/innovate, (3) learn/acquire, and (4) innovate/educate. According to these authors, the learn/replicate process occurs when an individual, with experience and knowledge of an industry, identifies unmet market demand and replicates an existing product or service to serve the unmet demand. The learn/acquire process occurs when an individual identifies a profitable business concept and exploits it by acquiring the business. Applying the distinction between tacit and codified opportunities, both the learn/replicate and the learn/acquire opportunity identification processes can be understood as being focused on relatively more codified opportunities, whereas the learn/innovate and innovate/educate processes can be understood as being focused on relatively more tacit opportunities. Recently, DeTienne and Chandler (2007) found evidence of gender differences in opportunity identification processes whereby men were significantly more likely than women to use learn/replicate and learn/acquire opportunity identification processes. One possible explanation

for why these processes covaried is that both processes are focused on the identification of relatively codified opportunities. As a result, an important direction for future research is to explore how the opportunity identification processes relate to the types of opportunities identified.

This research provides important implications for the growing stream of research on opportunity identification and entrepreneurial learning. Recent work in this domain has highlighted how differences in acquiring and transforming information and experiences may lead to the identification of differing numbers of opportunities (Corbett 2007). Combining the notion of different acquisition and transformation processes with our research on different forms of entrepreneurial opportunities suggests that a more nuanced understanding of opportunity identification beyond the number of opportunities identified may be possible. For example, though the intention mode of transforming information has been found to be related to the identification of fewer opportunities, it is possible that the identification of opportunities may have been influenced by the nature of opportunity being explored. That is, the relatively tacit nature of the technology being explored may confound the number of opportunities with the nature of the opportunities. To more fully understand how information acquisition and transformation processes relate, it may be useful to include both relatively more tacit and more codified opportunities within the quasi-experiment, as individuals who tend toward intention may recognize fewer tacit opportunities but perhaps more codified opportunities. In this way, research could begin to disentangle the contingencies of opportunity identification-related differences in the type (or tacitness) of the opportunity. Though additional work is clearly needed to extend the current findings,

this research does provide an example of how researchers can simultaneously account for variance in both spheres of the I-O nexus in order to further understand the opportunity recognition and learning processes.

Another contribution of this research is related to the development and use of social networks and entrepreneurial teams in the identification of opportunities. Normative prescriptions have often encouraged the development of diverse social networks and entrepreneurial teams because such networks are thought to be more useful for the identification of opportunities (e.g., Singh 2001). However, this research suggests that such prescriptions may need to be modified based on important contingencies (e.g., the tacitness of the opportunity) that affect the search and transfer of such information. Diverse social networks may be more useful in the search for and identification of relatively more codified opportunities because the information associated with such opportunities is easily communicated even across relatively weak network ties. Therefore, the search benefits of the diverse network are maximized (Granovetter 1973). However, in the case of tacit opportunities, the search for and identification of novel information may be more than offset by the difficulties in the transfer of information from one member of the network to the entrepreneur. This has been referred to as the search-transfer problem (Hansen 1999). Thus, the present research suggests that entrepreneurial networks may need to be developed based upon the fit between the social network structure and the type of entrepreneurial opportunity. The application of a fit perspective (Kristof 1996) between individuals and opportunities represents an important future direction of understanding the I-O nexus.

Our findings raise important issues for further understanding the intentionality

and rationality of entrepreneurial action. McMullen and Shepherd (2006) developed a conceptual model relating knowledge and motivation to entrepreneurial action. In their model, they draw an important distinction between third-person and first-person opportunities. A third-person opportunity exists as a potential opportunity for someone in the marketplace. According to their model, the transition from a third person to a first person occurs as a result of the desirability and feasibility of exploitation. Extending the current research, a codified opportunity may reduce concerns about the feasibility of the exploitation of an entrepreneurial opportunity. As a result, a greater degree of opportunity codification may affect the willingness of someone to engage in entrepreneurial action by lowering the threshold for entrepreneurial action by reducing doubt associated with the feasibility assessment by the entrepreneur. In addition, as prospective entrepreneurs engage in the exploitation of relatively more codified opportunities, they may either experience changes in self-efficacy (Bandura 1982) due to the relative success of the exploitation. This influence on self-efficacy may affect the future desirability of entrepreneurial endeavors. Therefore, future research should examine the relative success of entrepreneurial efforts based upon the degree of tacitness of the opportunity in terms of overall value, persistence, and future engagement in entrepreneurial activities. In sum, the codification of an opportunity appears to represent an important contribution requiring future research given the relationship to several aspects of the entrepreneurial process.

This study also has important implications for entrepreneurship education. For example, the inclusion of the relatively more codified or underexploited opportunities may be an important process whereby novice entrepreneurs could refine their cognitive processes of

pattern recognition (Baron and Ensley 2006). Given the seminal contributions of scholars such as Schumpeter, entrepreneurially oriented education programs often have a tendency to focus disproportionately on the identification and exploitation of tacit opportunities or new innovations. When comparing novice and experienced entrepreneurs, Baron and Ensley (2006) found novice entrepreneurs were more likely than experienced entrepreneurs to have mental prototypes of business opportunities that focused on the novelty of the idea, the use of new technology, and the potential to change an industry. By comparison, experienced entrepreneurs had a more pragmatic focus on solving a customer's problem and generating positive cash flow while managing their risk. Integrating these ideas, entrepreneurship educators may better serve their students by focusing on these underexploited opportunities as a means to reshape the cognitive frameworks of novice or student entrepreneurs to encourage more focus on pragmatic considerations and reduce the likelihood of novice entrepreneurs being "cognitively dazzled" by the novelty of the opportunity. As such, codified opportunities may provide an important real-life laboratory for students, particularly undergraduate students, who seek to move directly into an entrepreneurial career. Similarly, the matching of the aforementioned learning styles and different types of entrepreneurial opportunities suggests that pedagogical refinements in entrepreneurship education that accommodate a wider range of opportunities varying in their degree of tacitness may be necessary.

Limitations and Future Research

Though our research offers several important contributions, these contributions must be considered in the context of the potential limitations. One potential limitation is the measure used to opera-

tionalize the degree of tacitness of an entrepreneurial opportunity. Since we did not have a direct measure of the degree of tacitness of an opportunity, we developed a formative index of three items (business structure, availability of information, and future availability of the opportunity) as a proxy to measure this variable. We realize the operationalization of opportunity type is potentially coarse and open to discussion. For example, though opportunities measured at the endpoints of the continuum (tacit = 3; codified = 0) were less problematic, the summation of the formative index presents the potential for disparate interpretation at midpoints along the continuum. Should a franchise with limited availability of information and extensive future availability of the opportunity be considered relatively more tacit than an independent business developed on widely available information? Therefore, the results warrant caution in their interpretation.

To minimize the issues of interpretation and to more accurately represent the potential distribution of opportunities, we used a continuous scale rather than a dichotomous scale for the degree of tacitness of the opportunity. In addition, we conducted post-hoc analysis using a dichotomous variable operationalizing this variable in two different ways (3 and all other [0, 1, and 2]; all other [1, 2, and 3] and 0). In both cases, the direction and pattern of the results remained unchanged, which provides substantive evidence that the results were related to the underlying variable rather than the manner in which it was operationalized. Given the prominence of the role of the opportunity in the I-O nexus, a major priority for future research in the area of entrepreneurship is the measurement and operationalization of entrepreneurial opportunities. Though some work has begun in this regard (e.g., DeTienne and Chandler 2007), additional work is needed in the area of measurement of

entrepreneurial opportunities. As one example related to the current study, future research could draw upon work in knowledge management, which has begun to address issues associated with how to operationalize tacit knowledge (Ambrosini and Bowman 2001). The work on the measurement of tacit knowledge could then be applied in the measurement of tacit opportunities. As noted, this is an exploratory study to both operationalize the opportunity and to separate it from the individual.

Second, in the current study, we viewed the opportunity as an objective phenomenon (Shane and Venkataraman 2000). Though the objective view of the opportunity represents an interesting direction, other researchers have argued for different views on the opportunity (Saravathy et al. 2003). Further research should examine if degree of codification has both objective and subjective components. Using perspectives of both the prospective entrepreneur and a panel of experts to assess the same opportunity may be one way to examine these differing views of entrepreneurial opportunities.

Third, the current study used data collected from the PSED. Though the use of PSED offers many benefits, it also has some drawbacks. For example, the use of secondary data limits input from the researcher about the measurement of constructs. In the current study, such limitations included a dichotomous variable for the work experience. The PSED has also been criticized for shortcomings, including difficult and confusing questions and data collection from a single source. Despite these limitations, the PSED offered a nationally representative sample of nascent entrepreneurial opportunities. As such, it avoided many of the challenges of survivorship bias. Future research should begin to collect primary data that allows for more control and external validity of the measurement of entrepreneurial opportunities.

Fourth, our study focuses only on the opportunity type and recognition process implications. Future research is needed to explore the influence of opportunity type on important entrepreneurial outcomes, such as performance. For example, the extant literature argues that opportunities differ in expected value (Eckhardt and Shane 2003). Though the distinctive advantage offered by a tacit opportunity may lead to a higher expected value, the potential lower risk of a codified opportunity may also impact the expected value of the opportunity. Future research may help guide both researchers and practitioners in this regard.

Conclusion

This study adds to the emerging research on the role of entrepreneurial opportunities and their effect on the entrepreneurial process at the I-O nexus. Specifically, this research contributes to the relatively limited empirical work that focuses on how variance in the entrepreneurial opportunity may affect the process of opportunity identification. By offering an expanded definition of an entrepreneurial opportunity and attempting to measure the degree of tacitness of the opportunity, this research begins to open the black box of opportunity identification. Based upon the findings in this study, the type of entrepreneurial opportunity revealed a contingent relationship to both the entrepreneurial discovery process and the role of prior knowledge. Relatively codified opportunities were more likely to be discovered through systematic search, whereas prior experience was more useful for the discovery of tacit opportunities. Continued research that accounts for variance in both the individual and the opportunity is needed within and beyond the scope of opportunity identification to continue to move the field of entrepreneurship forward.

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