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**HEDGING YOUR BETS:  
EXPLAINING EXECUTIVES' MARKET LABELING  
STRATEGIES IN NANOTECHNOLOGY**

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## **ABSTRACT**

Executives use market labels to position their firms within market categories. Yet, this activity has been given scarce attention in the extant literature that widely assumes that market labels are simple, prescribed classification brackets that accurately represent firms' characteristics. By examining how and why executives use the nanotechnology label, we uncover three strategies: claiming, disassociating, and hedging. Comparing these strategies to firms' technological capabilities we find that capabilities alone do not explain executives' label use. Instead, the data show that these strategies are driven by executives' aspiration to symbolically influence their firms' market categorization. In particular, executives' perception of the label's ambiguity, their avoidance of perceived credibility gaps, and their assessment of the label's signaling value shape their labeling strategies. In contrast to extant research, which suggests that executives should aim for coherence, we find that many executives hedge their affiliation with a nascent market label. Thus, our study shows that in ambiguous contexts, non-commitment to a market category may be a particularly prevalent strategy.

## **Introduction**

All executives face decisions about how to represent their firms (Pfeffer and Salancik 1978, Ashforth and Gibbs 1990). Given the ubiquity of this challenge, symbolic management scholars have shown that executives adopt and manipulate symbols in attempts to shape stakeholders' perceptions of their firms (Dutton and Dukerich 1991, Elsbach 1994). Executives engage in symbolic management to acquire material resources (Ashforth and Gibbs 1990), build legitimacy (Glynn and Abzug 2002), implement strategies (Fiss and Zajac 2006), and generate affiliations among organizations (Zajac and Westphal 1995). Symbolic management is particularly relevant in nascent markets where firms' actions such as signaling efficiency, organizational skills, and good stakeholder relationships, facilitate resource acquisition (Zott and Huy 2007). Studies show that firms may gain beneficial market positions by conveying leadership or a unique identity through disseminating stories about the nascent market (Lounsbury and Glynn 2001, Santos and Eisenhardt 2009; also Kennedy 2008) or selecting suitable company names (Lee 2001, Glynn and Abzug 2002, Glynn and Marquis 2004). Yet, despite research on the outcomes and practices of symbolic management, studies pay scarce attention to how executives manage one of the most fundamental issues a firm faces: its membership in a market category.

Categories play a key role in organizing markets (Rosa et al. 1999). The market categorization literature suggests that the way in which stakeholders perceive firms' categorical membership is crucial to their performance and governance (Zuckerman 1999, 2000, Hsu 2006), the construction of rivalry among firms (Porac et al. 1995), and the emergence of nascent markets (Rosa et al. 1999, Pólos et al. 2002, Garud et al. 2010). Membership in a market category is often established through a market label that stakeholders assign to a firm (e.g. Porac et al. 1995, Hannan et al. 2007). A market label is a type of symbol used to signify membership in a particular market category. Common examples of market labels include "biotechnology", "healthcare" and "construction", each of which convey different expectations for a firm affiliated with those labels. Market labels, hence, create shared reference points that influence how stakeholders conceive of and act toward an organization (Zuckerman 1999, Hannan et al. 2007).

Overall, our knowledge of market labels remains underdeveloped and existing literature provides contradictory arguments. The symbolic management literature suggests that executives actively manage their firms' categorical affiliations (e.g. Ashforth and Gibbs 1990, Glynn and Abzug 2002); whereas studies on market categorization assume that firms operate in stable market contexts where stakeholders assign labels based on a firm's actual capabilities (e.g. Porac et al. 1995, Hannan et al. 2007). The market categorization literature also emphasizes the detrimental effect of membership in multiple categories as this conveys confusing signals to stakeholders about a firm's characteristics (Zuckerman 1999, Pólos et al. 2002, Hsu 2006, Hannan et al. 2007). In contrast, research in symbolic management suggests that balancing the demands of multiple stakeholders simultaneously may provide firms with strategic flexibility (Oliver 1991, Fiss and Zajac 2006). These incongruities suggest that executives face a conundrum about how to use market labels – a challenge that is heightened in nascent markets where categories are under construction. In such contexts, ambiguity impedes assessment by market participants of a label's categorical reference and firms' technological capabilities (also Alvesson 1990, Santos and Eisenhardt 2009). As such, both consistency and strategic flexibility may be advantageous in ambiguous contexts. We therefore set out to investigate *1) how do executives use market labels to signal membership in nascent market categories?; and 2) why do they use particular market labeling strategies?*

We focus on nanotechnology, a context in which use of market labels is highly salient to executives. Nanotechnology is a nascent market as the technology is emerging and few dedicated products exist. Simultaneously, the meaning of the market label “nanotechnology” is under construction and executives rely on weak cues when deciding upon its use (Berube 2006). However, many executives are explicitly staking their firms' future on the assumption that the market will grow dramatically in coming years.

Our research contributes in multiple ways to understanding how and why executives use nascent market labels. This study bridges symbolic management literature that overlooks the importance of strategically managing market categories, and market categorization research that assumes that labels are prescribed, accurate classification brackets by showing that executives actively manage their firms' perceived categorical membership. Specifically, we identify three labeling strategies –

claiming, disassociating, and hedging – and show how executives employ them to signal their firms' market category membership. When comparing these strategies with firm capabilities, we find that capabilities alone do not explain executives' actions. Not only do executives in firms without the necessary capabilities affiliate their firms with the label, but we also find that many executives choose to actively distance their firms from the label even if they possess such capabilities. Departing from existing studies, we find that many executives hedge their bets; that is, span categories by sometimes using and at other times disassociating the label, regardless of their firm's capabilities. In particular, executives hedge when a market label is perceived as ambiguous or creating credibility gaps. By identifying executives' labeling strategies and perceptions influencing their use, we show that market labels are not binary constructs simply indicating a firm's actual characteristics. Our study thus establishes that organizational scholars need to pay close attention to both what labels denote and connote to better understand market categorization.

## **Labels as a Symbolic Resource in Nascent Markets**

In the symbolic management literature, the term 'symbol' refers to a word or object that suggests or represents meaning (Ashforth and Gibbs 1990, Zott and Huy 2007). As such, symbols mediate socially constructed meanings that extend beyond the intrinsic content or function of the word or object in question (Morgan et al. 1983). Labels are particularly important symbols because they can cross organizational and cultural boundaries due to their capacity to shape understandings through discourse (Ashforth and Humphrey 1997, Phillips et al. 2004). A further strength of labels as a tool for symbolic management is that they function as boundary objects (Star and Griesemer 1989, Carlile 2002, Bechky 2003) by facilitating communication among disparate stakeholders (Lamont and Molnár 2002). Labels and categories differ in that a label is a sign or symbol that transmits certain meanings across time and place, while a category is a collection of objects from which those meanings derive (Vygotsky 1987, Navis and Glynn 2010). Whereas labels can cross boundaries, the categories to which they refer are constructed and made meaningful through the labels' use in local contexts (Barley 1983).

A label associates an object with a system of meaning consisting of the label's denotation (or explicit meaning) and connotation (or implicit meaning) (Pierce 1931). The *denotations* of a label are its literal categorical reference, that is, the set of objects to which it refers (Vygotsky 1987). For example, the label "non-profit" denotes a diverse set of organizations such as the Bill and Melinda Gates Foundation, the United Way, and the Red Cross. These organizations form the label's categorical referents, or in other words, the organizations to which potential members of the category are compared for similarity. The *connotations* of a label are the underlying meanings that a label references (Becker 1963, Barley 1983, Petrilli and Ponzio 2005, Weber et al. 2008). For instance, the market label "biotechnology" may implicitly connote meanings such as "exciting", "risky", and "capital-intensive", which are then associated with organizations that employ the label. Not only do market labels play an important role as signifiers of similar firm characteristics, but also as differentiators (Hsu and Hannan 2005). For instance, the "biotechnology" label signals that a firm is involved with high technology and biological sciences, while the "materials" label references lower technology and basic raw supplies. Dissimilar labels tend to exaggerate distinctions between similar entities and similar labels tend to diminish differences between dissimilar entities (Zerubaval 1997). Two firms that have similar activities, but are categorized under different market labels (e.g. firms making biodegradable plastics labeled as "biotechnology" or "materials") will be, therefore, viewed as more different than their activities suggest.

Nascent markets are an especially rich context for studying market labeling activities from the perspective of both executives and stakeholders. Nascent markets are characterized by an unclear meaning system (Alvesson 1990, Aldrich and Fiol 1994, Anteby 2010) resulting in ambiguous market boundaries (Santos and Eisenhardt 2009), a lack of schemas and scripts about products (Hargadon and Douglas 2001, Jones et al. forthcoming), and inadequate institutional logics to coordinate action (Kaplan and Tripsas 2008). Communication is challenging because such contexts consist of several communities (Rao 1994, Lounsbury et al. 2003, O'Mahony and Bechky 2008) and draw from established beliefs in related fields (Lamont and Molnár 2002). Therefore, multiple meanings of a nascent market label can co-exist in separate, yet overlapping social worlds (Kraatz and Block 2008) leading firms and other actors to offer competing definitions (Fligstein 1996).

Amid this ambiguity, the executives of firms within nascent markets face the challenge of establishing meaning and legitimacy for their firms' activities as well as for the emerging category (Smircich and Stubbart 1985; Aldrich and Fiol 1994, Kennedy 2008). Executives achieve this task by using language and labels strategically and, at times, ambiguously to forward their goals (Eisenberg 1984, Jackall 1988). For example, by using a market label, executives explicitly denote their firms as belonging to a particular market category. Such use of labels can be either substantive or symbolic. Executives' substantive use of a market label aligns actual activities, structures, and processes of firms with their perceptions of a label's denotations and connotations. In contrast, executives' symbolic use of a market label is aspirational or opportunistic (see Ashforth and Gibbs 1990) and therefore may not be aligned with firms' actual capabilities.

## **Market Labels as a Tool for Symbolic Management**

The use of various symbolic resources to manage stakeholders' perceptions is the central topic in the symbolic management literature. Santos and Eisenhardt (2009) demonstrated that firms in nascent markets can obtain advantageous positions by symbolically managing how stakeholders perceive their firms. In particular, they showed that firms that engage in claiming, demarcating and controlling practices are more successful than firms that do not. Other studies have found that executives attempt to satisfy external demands for accountability by aligning explanations of firm actions with socially legitimate language while leaving internal practices untouched (Zajac and Westphal 1995, Fiss and Zajac 2006, Etzion and Ferraro 2010). Similarly, Hudson and Okhuysen (2009) suggested that organizations manage expectations by adopting certain business practices and avoiding those that may be stigmatized. Together, this body of research shows that executives may successfully use symbols that are decoupled from the actual capabilities of their firms. Yet, how and why executives associate their firms with a market category has largely been overlooked by symbolic management scholars.

Studies on organizational names provide insight into how executives manage their firms' market categorization (e.g. Lee 2001, Glynn and Abzug 2002, Glynn and Marquis 2004, Phillips and Kim 2009). Names can create an affiliation with market categories when similar firms adopt a particular

type of name. For example, names containing the “gen” affix like “Genentech”, “Amgen” and “Biogen” tend to be biotechnology firms related to genetics. Names are, therefore, one type of symbolic resource that executives can use to associate their firms with a market label. For example, in the late 1990s, firms that adopted the suffix “.com” to their name were evaluated as the members of the emerging internet commerce category (Lee, 2001). Likewise, after the internet bust, the “.com” label continued to signal membership in this category, but this time the association yielded negative outcomes for the firm (Glynn and Marquis 2004). Phillips and Kim (2009) even uncovered that naming strategies can be used deceptively to gain beneficial outcomes for a firm, such as entering a new business segment, while downplaying any threats to the firm’s identity that such a move may cause.

In contrast to symbolic management, the market categorization literature addresses market labels by examining the impact of perceived category membership on industry dynamics and firm performance (Porac et al. 1995, Zuckerman 1999; 2000, Hsu 2006). This literature posits that market labels are important to the construction and function of market categories (Hannan et al. 2007). Specifically, stakeholders construct novel categories by assigning labels to firms (Rosa et al. 1999, Rosa and Porac 2002, Hannan et al. 2007) and base their market labeling activities on observable features such as the firm’s resource utilization, technology, geographical proximity, and customers (Hannan et al. 2007). In general, this research assumes that the perceptions of external actors regulate how each firm is categorized through the identification of common, substantive features (Porac et al. 1995, McKendrick et al., 2003). Yet, these studies examine stable contexts and overlook situations where stakeholders lack knowledge about firms’ actual products and capabilities (see also Alvensson 1990) and, in turn, assume that market labels reflect firms’ product portfolio. This is particularly prevalent in nascent markets where a market forms around a set of novel technologies about which limited understanding exists outside specialized professions (Santos and Eisenhardt 2009).

Together, research in symbolic management and market categorization has yielded an array of insights into how executives use symbols and the importance of market labels and categories, respectively. Yet, these two literatures have rarely informed each other. Thus, symbolic management scholars have overlooked market categorization as a problem that needs to be symbolically managed,



and researchers in market categorization assume that categorical memberships are distinct and based on actual capabilities. Further, while literature shows that firms benefit from engaging in symbolic management, it is unclear how executives determine the extent to which their signaling should represent the actual capabilities of their firms. These literatures also present contradicting strategies for managing multiple affiliations. Market categorization literature suggests that firms benefit from belonging to a single market category (Zuckerman 1999; 2000) because stakeholders monitor and sanction firms for violations in label use (Pólos et al. 2002; Hannan et al. 2007). In contrast, symbolic management studies suggest that these negative repercussions may be outweighed by the benefits of judicious label use that signals several meanings simultaneously (Oliver 1991, Padgett and Ansell 1993). It, therefore, remains unclear how and why executives use market labels in contexts where both the market boundaries and the market label's meaning are uncertain and unsettled.

To address these questions, we examine executives' labeling strategies through a grounded study of a nascent market. Through our analysis, we identify three labeling strategies. When we compare these with the firms' capabilities, the data indicate little relationship. Instead, we uncover that executives' choice of a labeling strategy is driven by their perception of the label's ambiguity, their avoidance of perceived credibility gaps, and their assessment of the label's signaling value. In contrast to existing research which stresses that executives aim for coherence rather than ambiguity (e.g. Pólos et al. 2002; Hannan et al. 2007), we show that many executives strive to span categories by hedging their bets with multiple market labels and ambiguous labeling. Our findings show executives do not accept market labels as prescribed classification brackets, but that they actively manage their firms' category membership. Most importantly, our findings explain how and why executives use nascent market labels.

## **Methods**

### **Setting: The Emerging Market for Nanotechnology**

We adopted a grounded, inductive approach to examine executives' labeling activities. The best research settings for building theoretical frameworks are contexts in which the phenomenon of

theoretical interest occurs in abundance (Garfinkel 1967, Eisenhardt 1989a, Yin 2003). In such rich settings, researchers are able to observe multiple instances of the phenomenon and extricate underlying mechanisms. Thus, we chose to study the emerging market for nanotechnology because it is a domain in which the use of the market label is fraught with ambiguity (Berube 2006). For instance, Woolley (2007) found that of 1682 firms listed in five nanotechnology directories, only 298 had nanotechnology capabilities. We collected real-time data while executives made strategic decisions about their use of the nanotechnology label (henceforth referred to as nano-label). This approach minimized retrospective bias, which is particularly important when a study addresses thought processes and opinion formation since these can be influenced and reconstructed to fit subsequent understanding (Lofland and Lofland 1995).

Nanotechnology has garnered considerable attention from governments, researchers and businesses when the United States and European Union established it as a strategic focus area in public policy at the millennium and increased the funding for nanotechnology activities tenfold over the next five years (Woolley and Rottner 2008). This incentivized actors ranging from commercial firms to universities and research centers to associate with 'the science of the small' for access to these new funding sources (Zucker et al. 2006, Grodal and Thoma forthcoming). The most widely adopted definition of nanotechnology refers to the control of matter between approximately one and 100 nanometers<sup>1</sup> (National Science and Technology Council 2000). This definition is, however, contested and unclear, which has resulted in a wide spectrum of existing research and development activities being bundled together under the same label (Granqvist and Laurila 2011). For example, incumbents from industries ranging from sporting equipment and textiles to drug delivery, semiconductors and photovoltaic devices, have become labeled as nanotechnology even though many have only a marginal or even tenuous link. Furthermore, the specialized and complex nature of the technology makes it challenging for an observer to determine whether a firm actually uses nanotechnology (Berube 2006).

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<sup>1</sup> A nanometer is one-billionth of a meter or the width of three to six adjacent atoms, depending on the atom. To provide an idea of this size scale, the radius of the period in the end of this sentence is about 500 000 nanometers in diameter.

Nanotechnology provides an interesting setting in which norms for what constitute the emerging technology have not yet materialized, and where concealment of firms' substantive activities is relatively easy. Thus, stakeholders often accept even inaccurate signals from firms conveying their participation in the market because they have little or no criteria for judging the validity of the signals. For example, venture capitalists may accept at face value a chemicals firm that signals "nanotechnology" because they may lack the particular skills to judge the technical viability of the claim. Hence, firms with and without nanotechnology capabilities (henceforth nano-capabilities) can use the nano-label with few repercussions. This arbitrary use of the nano-label has generated confusion about the boundaries of nanotechnology. Additionally, key stakeholders, including the business press, have voiced concern that the expectations about nanotechnology are unrealistic. In particular, they have questioned whether nanotechnology companies will ever create viable products or generate revenue (Berube 2006). Nanotechnology is, thus, a contested market label that is under construction. Due to the ambiguity and interest that surrounds the label, the emerging market for nanotechnology provides a particularly appropriate opportunity to investigate executives' market labeling strategies.

## **Data**

*Interviews.* We conducted semi-structured interviews with 59 executives from 51 firms related to nanotechnology. The interviews took place from 2004 to 2006. Being a nascent market at the time, executives were actively evaluating the label and market while determining their labeling strategies. In the interviews executives elaborated on their perceptions of the label as well as their use of the label in various situations when representing the firm. Interviews allowed us to trace the executives' perceptions of nanotechnology, the extent to which they thought their firms had nano-capabilities, and the implications of using the nano-label. We focused on executives because they have the most extensive understandings of the activities and strategies of their firms. They also have the greatest leverage to make strategic decisions, including how their firms are represented to external stakeholders (Elsbach 2006).

We used multiple sources to identify suitable firms to avoid the potential sample bias caused by any single sampling strategy. Mirroring standard practices within qualitative research (e.g. Evans et al. 2004, O'Mahony and Bechky 2006, Santos and Eisenhardt 2009), we identified the firms from web-based nanotechnology directories and referrals from experts in the field and interviewees. Of the firms, about a third were randomly selected from nanotechnology directories and two-thirds were identified through referrals. We acknowledge that ours, like all sampling methods, has limitations. For example, we may have excluded firms that had nano-capabilities, but did not have a reputation for being a nanotechnology company nor themselves claimed to be one. These firms are, however, outside of the scope of this study. Additionally, such bias adds to the credibility of our findings: even sampling among the directory-listed companies and including firms based on referrals, we find a variety of labeling strategies.

We selected firms from multiple institutional contexts and across eleven industries participating in nanotechnology, including biotechnology, chemicals and instrumentation, as a means to increase the robustness of our findings (Yin 2003). Over three-quarters of the firms were start-ups and the remainder large diversified firms. Further, our sample composed of 71% North American and 29% Northern European firms. All the firms sampled either had a reputation as a nanotechnology firm, as they were either identified by field experts or business directory compilers, or the firms themselves had created an association with nanotechnology. Further, all our firms had some resemblance to a nanotechnology firm in that they were high-technology and research intensive companies active in industries where nanotechnology is relevant. The sampling strategy, therefore, provided a diverse set of firms for analysis.

Informants within the firms were selected from phone and email solicitations with firm CEOs. If the CEO was not available, the authors petitioned another top executive. Of the informants, 9% were founders, 15% CEOs, 24% Founder-CEOs, 15% other chief executives, and 37% other executives or managers. Interviews with executives lasted between 20 minutes and three hours and covered topics such as the definition of nanotechnology, the emergence of the market for nanotechnology, and aspects of commercialization. We asked each executive to describe her firm, its technology, products and services. Executives also discussed how they position their firms within the market and whether

they use the nano-label in association with their firms. The interviews started with a set of open-ended questions and progressed to free dialogue. Eighty percent of the informants consented to recording of the interviews that were transcribed verbatim, totaling over 600 pages. For the remaining 20%, the authors wrote extensive and detailed notes.

*Archival materials.* In addition to the interviews, we gathered archival material about each firm from public sources including websites, press releases, intellectual property reports, and annual reports. These data were gathered for their details of technologies, product features, and signaling activities. The data allowed us to triangulate the executives' accounts of their signaling activities and firm capabilities with public sources describing such. Specifically, we evaluated the products and capabilities of each firm to determine whether nanotechnology was used; that is, whether they reached the size scale of 1-100 nanometers<sup>2</sup>. The few cases of disagreement among data sources were solved through further investigation of firm products and capabilities.

## **Analysis**

Qualitative, inductive methods are especially suitable when a study explores the emergence of new social domains (see Lee 1991). Thus, we used grounded theory analysis (Charmaz 1983, Glaser and Strauss 1967) to identify executives' market labeling strategies and to investigate their antecedents. To remain flexible and make adjustments accordingly, we overlapped data collection and data analysis in an iterative process (Eisenhardt 1989a). Learning during the data collection period generated an increasingly specific repertoire of supplementary questions for successive interviews. Preliminary data analysis also occurred while the authors transcribed the interviews providing further familiarization with the data. After collection, we analyzed the data using computer assisted software. Two of the three authors coded each interview. We made several forays into the data and our coding proceeded recursively in that we reiterated the codes until a clear framework emerged.

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<sup>2</sup> We acknowledge that the size driven definition is arbitrary and contentious. We employ such a definition, however, for pragmatic reasons and due to the fact that 100 nm is a widely accepted boundary for nanotechnology.

*Identifying labeling strategies.* The first iteration of coding focused on identifying the types of labeling strategies that the executives employed. We focused specifically on instances where executives talked about how they position their firms, which labels they used to describe their firms, and to whom they signaled these affiliations – that is, the different ways in which they denoted their firm. Through the analysis, we identified three types of symbolic practices that the executives used: naming, rhetoric, and non-verbal practices. Naming entailed executives purposefully including or excluding “nano” in the company, product or unit name. Rhetoric practices involved executives signaling an affiliation or disassociation with nanotechnology through language or discourse. For example, they made statements such as “I often position my firm as a nanotechnology firm”, or “I object when people label us as a nano-firm”. Non-verbal practices entailed executives engaging in non-verbal practices including representing the firm in events such as conferences and networking events that carried the nano-label. Some executives listed their firms in nano-related directories or showcased them in magazines. Other executives rejected invitations to participate in nanotechnology events and actively monitored whether their firms were represented in nanotechnology directories, at times requesting removal. After identifying this typology of symbolic practices, we reanalyzed the interviews. This analysis led us to the insight that executives used these three practices to signal their firms’ affiliation with the nanotechnology category. Further analysis revealed three distinct labeling strategies: claiming, disassociating and hedging that we detail in the findings section.

*Identifying antecedents for label use.* Once we had identified the labeling strategies, each author coded the interviews again to uncover what influenced each executive’s use of a particular labeling strategy. After discussing and comparing our coding, we identified several antecedents to executives’ labeling strategies. Specifically, we found three types of perceptions about the label that mapped onto the executives’ selection of a labeling strategy. Once we had established the executives’ labeling strategies and the associated perceptions, we re-examined the data to create a deeper understanding of the fine-grained relationship between the two. The concepts that evolved from our coding created the foundation for our framework for executives’ labeling strategies.

## Findings

Executives engage in symbolic management by signaling their affiliation, or lack thereof, with the nascent nanotechnology market through their use of the nano-label. We begin this section by identifying three labeling strategies that executives used to manage their firm's categorical affiliation. We compare these labeling strategies with the firms' capabilities, but find little relationship. Instead, we uncover that the executives' choice of labeling strategies was mostly driven by their perception of the label's ambiguity, their avoidance of perceived credibility gaps, and their assessment of the label's signaling value. Finally, we integrate our findings into a framework for executives' labeling strategies.

### Executives' Labeling Strategies

We find that labeling is not a simple dichotomous decision - to use or not use. Instead, we identify three strategies executives employ to denote their firms' market membership: *claiming*, *disassociating* and *hedging*. Although the current literature focuses on claiming and gives some attention to disassociating, we uncover that these three strategies are equally prevalent in a nascent market. Table 1 provides a description and examples of the symbolic practices used with each labeling strategy. We detail the three strategies below.

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Insert Table 1 about here  
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**Claiming.** Claiming involves creating an explicit, confirmative relationship between the label and the firm. Executives used a claiming strategy by employing the label in the firm name or rhetoric; or creating an association through non-verbal practices. Signaling that the label denoted the firm was, thus, not only confined to a single practice, but also spanned a wide range of organizational actions. For example, Christofer, Chief Scientist of the start-up NanoCentauri,<sup>3</sup> claimed the nano-label by

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<sup>3</sup> The names of the executives and their firms have been changed for anonymity. Executives' with pseudonyms starting with "C" mainly claim the label, those starting the "H" hedge the label, and those starting with "D" mainly disassociate the label. We designed the pseudonyms to reflect the informants' ethnicity and gender.

using it in the name of the company and the rhetoric he disseminated about the firm: “I would say that we are a *real* nanotechnology company.” Executives at older companies also claimed the nano-label. Clark, the CEO of Nebula, explained that even though his firm was founded before the label existed, he now positions his company as a nanotechnology firm:

We are very different from some of the other nanotechnology companies in that we have been making these kinds of products for 50 years. Because you don't always need to have a name for it - you just do what you do. But then recently, within the last 10 years nanotechnology has come up as a separate field of research and business and then we could say that nanotechnology is exactly what we do.

According to Clark, after the nano-label surfaced, he started positioning Nebula as a nanotechnology firm, whereas before it was positioned as a materials company. In total, only just over a third of the interviewed executives claimed the nano-label. Hence, while the symbolic management literature has focused on investigating claiming activities, our data suggest that other labeling strategies are equally abundant.

***Disassociating.*** Disassociating entails actively distancing the firm from the nano-label. Executives disassociated their firms from the label by denouncing any connection in their firms' names, rhetoric, or non-verbal practices. That is, disassociating executives actively signaled that the label did not denote the firm. Yet, their firms became part of our sample because some stakeholders believed that they were nanotechnology firms. A quarter of all interviewees disassociated their firms from the nano-label, including Dylan, the CEO of Supernova:

I have never positioned [my firm] as a nanotechnology company... nor do I even believe that. We are using nano-engineering principles to get unique properties and performance and features that will allow us to do commercially valuable things with products in the energy sector. So, nano is not in our name. Four years ago I did not put nano in the company's name for good reason, and it's not like we went through a name change. My philosophy has been consistent, which is I don't see [my firm] as a nanotechnology company.

Dylan acknowledged that Supernova could have included the nano-label in its name, but he disassociated because he believed that it would signal a lack of commercially valuable products. Similarly, David, a board member of FemtoScope, succinctly summarized that, “FemtoScope is not associated with [nano] activities.... We don't want to position ourselves as a nanotech company because we are not.” Thus, our data show that executives attempt to manage their membership in a market category not only through association, but also through disassociation.



**Hedging.** The hedging strategy involves the active creation of ambivalence around the connection between the nano-label and the firm. Executives hedged by implying a connection with the nano-label, such that the message could be interpreted differently by various stakeholders, or by adopting conflicting verbal and non-verbal practices such as both claiming and disassociating simultaneously. For example, some executives explicitly rejected the nano-label in their rhetoric, but still represented their firms in nanotechnology conferences and networking events. Overall, almost forty percent of the executives hedged. For instance, Halle, CEO and founder of Advanced NanoSupply, was eager to use the nano-label for public relations purposes for some audiences while simultaneously managing the negative connotations of an emerging market among other audiences, such as investors:

*Nano is sort of a two-edged sword.* What we're trying to do is play the nano angle for what it's worth, put a little bit of buzz, PR and excitement while making it quite clear that this is a business area, these are our products, these are our markets, and we're expecting something out the door real soon. *We can play the nano card as we see fit.* Nobody gets excited about chemical technology. If we say: "Yeah, we're doing chemical technology" then stakeholders think of that really smelly area on the New Jersey turnpike. But with nanotechnology they say: "Ooh, nanotechnology. Oh, yeah, cool! Okay!" But even then we have to be *careful to balance our message for different audiences.* [our emphasis]

Halle also hedged by strategically manipulating the firm's name. At times she presented the company using the full name, Advanced NanoSupply, which included the nano-label. In other situations she represented the firm using only the acronym ANS, concealing an association with nanotechnology. Similarly, Homer, CEO of NanoVortex, hedged the label by using the firm's full name that included the nano-label, but he often explicitly disassociated from the label because he believed that too many firms already signaled nanotechnology: "I do not position the company as a nano company because there are so many companies out there where their focus is to be a nano company." Our data show that the use of the hedging strategy was, thus, a way for executives to obfuscate whether the nano-label denoted the firm.

### **The Relationship between the Label's Denotations and Firms' Capabilities**

After uncovering the executives' labeling strategies, we examined the relationship between the strategies used and their firms' capabilities. Much of the current market categorization literature

assumes that label use is related to a firm's actual capabilities – that is, an executive chooses to use a label when its denotations and the firm's technological capabilities are aligned. Of the 51 firms in our sample, however, only 31 (61%) had nano-capabilities. The remaining 20 firms did not have capabilities in this scale and hence, were not nanotechnology firms according to the definition by the National Science Foundation (NSF). Furthermore, incongruence between the executives' labeling practices and the firms' capabilities was abundant in our data. We found executives in firms with no nano-capabilities who claimed the label, executives in firms with nano-capabilities who disassociated from the label, and executives in both types of firms who hedged the label.

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Insert Figure 1 about here  
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Figure 1 depicts the relationship between an executive's labeling strategy and the capabilities of the firm. Only 46% of the executives of firms with nano-capabilities claimed the label. Thus, 54% of such executives chose to distance their firms from the nano-label by using disassociating or hedging strategies. These executives therefore understated their firms' relationship to the label. Further, of executives in firms without nano-capabilities, 25% claimed and 46% hedged. In other words, 71% of executives in firms without capabilities overstated their firms' relationship to the label. Overall, our data show that most executives refrained from using the labeling strategy that most closely represented their firm's actual capabilities – of all executives, 61% chose a labeling strategy that did not consistently align the label's denotations and the firm's technological capabilities. The hedging strategy proved to be a popular choice among our executives; its use was particularly abundant among executives of firms without nano-capabilities (46%). This suggests that hedging was a prevalent strategy for executives wishing to overstate their association with nanotechnology. In contrast, over a third of the executives from firms with nano-capabilities hedged.

A chi-square test examining the relationship between nano-capabilities and labeling strategy indicated no significant relationship.<sup>4</sup> Thus, our results show that although capabilities likely

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<sup>4</sup> The analysis showed no relationship between having label related capabilities and the type of labeling strategy ( $X^2=2.56$ ,  $df=2$ ). Further analysis showed no relationship between the labeling strategy and firm size ( $X^2=1.503$ ,  $df=2$ ), industry ( $X^2=18.679$ ,  $df=14$ ), nor country ( $X^2=11.891$ ,  $df=8$ ).

contribute to an executive's choice of a labeling strategy, they do not explain it. The diverse labeling strategies beg the questions: Why did the executives at firms with capabilities disassociate from the label while those at firms without capabilities claim it? And, what triggered hedging?

### **Executives' Perceptions of the Nano-Label**

After establishing the incongruence between the executives' labeling strategies and the firms' capabilities, we examined what led executives to choose a labeling strategy. We found that the executives' perception of both the label's denotations, that is its categorical reference, and the label's connotations, that is its underlying meaning, shaped their labeling strategies. Three aspects were particularly important: 1) the extent to which executives perceived the label's denotations and connotations as ambiguous, 2) their perception of the credibility of using the label to denote the firm, and 3) their perception of the value that the label connoted to stakeholders. In this section, we examine these perceptions in detail and show how they shaped the executives' market labeling strategies. We include illustrative quotes throughout and provide further examples in Table 2.

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***Denotation and connotation ambiguity.*** A key element in the executives' perception of the nano-label was the degree to which they perceived ambiguity around both the label's denotations and connotations. Executives considered how stakeholders define the label and whether this definition would change over time. These elements led executives to form an opinion about the ambiguity of the label.

How is the label defined? The definition of nanotechnology was not universally agreed upon, as mentioned above. Instead, multiple definitions of the nano-label co-existed. Many executives perceived that the nano-label denoted multiple categories and connoted a great variety of meanings to different stakeholders. As expressed humorously by Hakan, "Such a definition [of nanotechnology] has been adopted that it covers all the topics on earth from love-making of elephants to ship building; everything fits in. That is beneficial to no one." Hakan perceived that assessing the label's categorical reference is difficult, if not impossible, because its widely accepted definitions were vague

and lenient. Other executives had a narrow, specific definition in mind. For example, Darwin, a technical executive at Shuttle, clarified the variation in the definition of the nano-label:

My definition of [nanotechnology] is anything where the important science is at the nanoscale. For some people it just means everything – where anything involved is *smaller than a micron* [1000 nanometers]. For most people and most definitions it's anything where the features are *under a hundred nanometers*. You can be a little stricter and that's where *the important part* of what's going on is under a hundred nanometers. It is not just that it happens to be smaller, but because it's smaller it does something different. [*our emphases*].

Also, Darwin expressed that many people had adopted an overly broad view of nanotechnology. In his view, nanotechnology indicates that the important element of a feature should be smaller than 100 nanometers and that this feature should change the functionality of the product.

Irrespective of the technological capabilities of the firm, the executives' perception that the nano-label's definition was ambiguous led them to hedge the label, but for different reasons. For the executives in firms without nano-capabilities, confusion around the label's denotations provided the leeway to signal membership in the nano-category through hedging. For the executives in firms with nano-capabilities, perceptions that the label's connotations were ambiguous generated worries that they could not control meanings that the label would convey to stakeholders. Thus, these executives also hedged. When executives perceived that both denotations and connotations were highly ambiguous, however, executives in both types of firms tended to disassociate.

Are the label's denotations and connotations in flux? The majority of our informants perceived that the meaning of the label was changing. In particular, many executives worried that in the future the nano-label might denote membership in a stigmatized category and its use would generate negative connotations about their firms. This risk made executives ambivalent about how they should use the label. Devan, CEO and founder of Atlantic, stated, "I think the category is a serious risk. It is running out of time to legitimize itself." He highlighted that for the nano-label to denote a stable category, the companies employing the label needed to demonstrate both products and a market for the products – until then the business domain is founded on tenuous beliefs and excitement:

It comes down to products ... nanotechnology companies have been struggling to produce real products. And some of the more well-known ones have had no products. And products have got to happen quickly, or else this whole category is going to fall.

Approximately half of the executives expressed concerns that the nano-label connotes unrealistic

expectations about the long-term development of the technology among the key audiences. In fact, a quarter of the executives used the word “hype” to describe such excitement around nanotechnology. Casper, a vice president at NanoSense stated, “There’s no question that it’s over-hyped.” Hans, the CTO at Picolever, along with several other executives, perceived that such excitement connoted an impending backlash and the collapse of the nascent category among stakeholders: “Nanotechnology is a hype word and it could implode. Nanotechnology is still a frontier research area.”

Executives at firms without nano-capabilities who perceived that the categorical affiliations and underlying meanings of the nano-label would deteriorate over time tended to disassociate. When executives in the firms with nano-capabilities perceived the label to be in flux, it gave them the impetus to hedge. By hedging, executives were able to take advantage of the short-term benefits of being associated with the nano-label, while leaving open the possibility of disassociating in the future, depending on the label’s changing denotations and connotations.

***Denotation credibility.*** In the nascent nanotechnology market, membership in the nano category was unclear. Similarly, confusion arose as to which executives could be accused of deceitfully using the label to represent their firms. We found that in order to assess the credibility of using the label, executives considered if the label fit the firm and how stakeholders labeled the firm.

Does the label fit the firm? An important aspect of the label’s credibility was whether executives thought that the nano-label suitably described their firms’ technology, products or market; in other words, whether they perceived a fit between the label’s denotations and the firm. The availability of multiple definitions and the lack of consensus regarding their application allowed executives to appropriate their preferred definitions. For example, among the executives who defined nanotechnology as something smaller than 100 nanometers, opinions varied as to which part of the product or technology was required to reach these dimensions. Cyd, the CTO and vice president of Zepto, explained:

[My Company] is vertically integrated, so basically we not only make the materials, but we also make the devices and we will build the product too. So in the area of materials applications, we are 100% a nanotechnology company, but the product is going to be a photovoltaic [solar] cell. So if you see the company from the end product point of view, you are not going to be able to tell if it is nano or not.

Cyd suggested that if one assesses Zepto as a materials company, the use of the nano-label is valid. However, if one considers only the firm's end product – a solar cell – the nanotechnology affiliation is less clear. Further, some executives in firms without nano-capabilities, who perceived their firms to have sufficient resemblance to nanotechnology, hedged the nano-label. For example, Claus, a board member at StellarWind, considered it plausible to claim the nano-label even though, “[Our products] tend to be in ‘micromachining’ which strictly speaking is not nano according to my definition.”

The executives' perception of whether using the label was credible was also influenced by the degree to which they thought that their firms' market affiliations were ambiguous. For example, Hans, CTO, whose firm, Picolever, developed biological sensors, considered the strategic positioning of his company in microtechnology, biotechnology, medical instrumentation, and nanotechnology, each with its advantages and challenges:

In the beginning we saw ourselves as a microtechnology company, but we should not go out and sell ourselves as a microtechnology company... Saying that we are a biotechnology company is also problematic because most people associate biotechnology with drug development or something like that. So it's probably more a medical instrument technology. *In the end it really depends who is asking* because many people also want us to be nanotechnology. [our emphasis]

Because Picolever was embedded in multiple technological communities, Hans managed industry affiliations through assessing and adopting several suitable market labels simultaneously.

The fit between the label's denotation and the firm's capabilities shaped executives' perception of credibility and thus influenced their choice of a labeling strategy. When firms had nano-capabilities and their executive believed the label to suitably describe the firm and its markets, she was inclined to claim the label. Executives in firms without nano-capabilities who perceived ambiguity in the fit between the firm, its markets, and the label, viewed that they could credibly denote the firm through hedging.

How do stakeholders label the firm? Denotation credibility was further shaped by executives' perception of whether stakeholders denoted the nano-label to their firms or considered such categorization plausible. Almost two-thirds of the informants (64%) reported that stakeholders, such as venture capitalists, consulting firms, and the business press, labeled their firms as nanotechnology. These perceptions did not vary according to the nano-capabilities of the firm. Only a slightly smaller

proportion of the executives at firms without nano-capabilities perceived that stakeholders denoted their companies with the nano-label, compared to those at firms with nano-capabilities (62% versus 65%, respectively). Stakeholders were eager to label the firms even if they did not have the relevant capabilities. Executives considered that stakeholders engaged in such activity due to their self-interest in creating a novel category that would generate a market for their services. According to executives, stakeholders particularly used the nano-label to denote successful firms.

For example Hector, CEO of ZettaMaterials, explained that his firm was often asked to present at conferences titled “nanotechnology” even though his firm did not fit the official nanotechnology definition: “This idea of things that are smaller than a hundred nanometers and that by virtue of those dimensions produce novel physical properties – that's not what we're doing at all, but here we are, lumped into that [nano] category.” Devan, CEO and founder of Atlantic, also perceived a wide disagreement among stakeholders about his firm’s categorical membership:

[My company] gets categorized variously as a microfluidics company, a nanotechnology company, a nanobiotechnology company, a biotechnology company, which in one sense is good for us because it's indicative of the fact that we don't really fall neatly into any specific category which means that we're doing something new, which is great, of course, but also a challenge.

Executives’ perceptions of stakeholders’ labeling activities generated differing responses. When stakeholders labeled the firm as “nanotechnology,” executives in firms with nano-capabilities appeared more likely to claim the label, whereas those in firms without nano-capabilities perceived that they could credibly use the label, which seemed to lead them to hedge. If executives perceived that stakeholders did not label their firm, it led executives in firms with nano-capabilities to hedge, while such lack of attention from stakeholders led executives in firms without nano-capabilities to disassociate.

**Connotation value.** Finally, the executives’ labeling strategy was shaped by their perception of the value of the connotations that the label invoked. Executives considered this by assessing the label’s affiliation with resources and its ability to differentiate the firm.

Is the label affiliated with resources? An important task for executives is to secure access to

material resources such as public and private funding, and intangible resources such as legitimacy and collaboration. Executives considered the connotations that the label invoked for stakeholders and how these influenced their firms' access to resources. For example, some executives perceived that the nano-label compelled stakeholders to fund companies, whereas others stated that the use of the nano-label undermined their ability to obtain financing. Halle said, "A lot of people see 'nano' and they just assume you don't have a product yet or that you're not going to make products." She continued to say that the nano-label invoked a perception that the firm is at the pre-commercial stage and it would take considerable time before the launch of actual products and cash flow. Hakan had a similar view, "The nano-word has been used as an excuse for [not investing]. They [firms] say that it is interesting and important, but not yet our concern."

However, the majority of executives believed that using the nano-label helped them obtain resources. For example Charles, director at Pluto, said that he used the nano-label since "the National Nanotechnology Initiative has funded a lot of nanotechnology research and so we're trying to engage with them on a number of projects." Governments around the world launched a variety of nanotechnology programs and many venture capitalists dedicated funds to invest in nanotechnology. In response, executives often included the nano-label in grant proposals, websites, advertising material, and press releases. Even executives who chose not to use the nano-label recognized that it could be used to gain access to resources. For instance, Dean, vice president of AttoSemi, did not want to use the nano-label, but argued, "investors will invest in everything that has the word 'nano' in it." He further clarified:

When you are fundraising, having the word "nano" in front of [the firm's name] most probably helps because it at least opens up the door. As much as people say, "Oh, there are so many nano-firms," I can guarantee that everyone will look at [the business plan] because they don't want to be the one that rejects it. What if a proposal comes for a "Nano-Intel" and twenty years from now they'll be writing on their web sites that they missed [the opportunity]? So the word "nano" does buy you the entry cost... I think it opens the door. If I send [venture capitalists] a business plan saying "nano", they will most probably look at it.

According to Dean, the nano-label connoted that the firm had the potential to become a large and influential company (i.e. the Intel of the nanotechnology world), which attracted the attention of venture capitalists.



The perception of whether the nano-label facilitated or deterred access to resources shaped the connotation value that executives attributed to the label. Executives in firms both with and without nano-capabilities were more likely to claim the label if they perceived that it facilitated access to resources. Similarly, executives were more likely to disassociate from the nano-label if they perceived that it would deter potential investors.

Does the label differentiate the firm? Most of our informants' choices of labeling strategies were shaped less by striving to be similar to high-status or successful firms than by trying to signal uniqueness. Executives varied in the extent to which they perceived the nano-label as a differentiator; that is, whether the nano-label connoted novelty. For example, Homer, CEO of NanoVortex, viewed the nano-label as an important vehicle to distinguish his firm from other companies:

I think it [having nano in our name] has been an advantage in terms of profile and separating us from a lot of other companies that are out there. Any time people were potentially interested in nano, we were positioned very well.

Executives were, however, also concerned about the extent to which the label would generate negative connotations by grouping their firms with 'wannabe' companies. For example, Dean disassociated from the nano-label to differentiate his company from the many companies using it: "So it [not using nano in our name] is just a sign that we wanted to distance ourselves from being lumped in with all the thirty, forty companies that use the prefix 'nano'."

The perception of how other firms used the nano-label and the extent to which the label would attract stakeholders' attention shaped the executives' perceptions of the label's connotation value. Executives who perceived that the label signaled uniqueness for their firms, both with and without nano-capabilities, were more likely to claim the label. In contrast those who perceived that the label was used symbolically by firms without label-related capabilities tended to disassociate.

### **Framework for Executives' Labeling Strategies**

Our analysis of the data shows that executives' use of nascent market labels is not mainly driven by firms' capabilities, as suggested by the market categorization literature. Rather, our study revealed that the executives' perception of the label's ambiguity, their avoidance of perceived credibility gaps, and their assessment of the label's signaling value shape their labeling strategies. A framework

emerged from these findings that specifies the relationship between the executives' perceptions and their labeling strategies, as depicted in Figure 2.

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First, the framework unpacks the impact of ambiguity on executives' labeling strategies. We find that the extent to which executives perceive ambiguity around the label's denotations permits executives in firms without capabilities to overstate the label, that is, to signal traits that extend beyond a firm's actual product features. Hedging is a particularly useful strategy for overstating as it allows these executives to signal capabilities while simultaneously managing the risk of delegitimation that can arise from using the label misleadingly. In contrast, the extent to which executives perceive ambiguity about a label's connotations entails risks for executives in firms with capabilities, who respond by understating their firm's affiliation through hedging. This allows such executives to gain short-term benefits while managing the potential longer-term deterioration of the label. In contrast, executives in firms without capabilities respond to the risk of deterioration through disassociating. When executives perceive that both the denotations and the connotations of the label are ambiguous and in flux they disassociate from the label regardless of their firms' capabilities.

Second, the framework shows that executives consider whether using a label creates credibility gaps. Executives base this perception on whether the firm's products and capabilities resemble the label's denotations, and on their perception of stakeholders' denoting activities. Executives in firms without capabilities who perceive the label use to be credible overstate their firms' affiliation by employing a hedging strategy. In contrast, executives in firms with label-related capabilities with the same perception tend to claim the label. If executives in firms without capabilities consider that the label signals an implausible and illegitimate affiliation, then they tend to disassociate from the label. Further, executives in firms with capabilities who perceive that stakeholders do not consider them part of the emerging category tend to hedge, whereas executives in firms without capabilities disassociate.

Lastly, according to our framework executives who perceive that the label has connotation value in terms of obtaining resources or signaling uniqueness, tend to claim the label regardless of their

firms' capabilities. Similarly, executives in both types of firms who consider that the label may impair access to resources by inducing negative associations of the firm are likely to disassociate.

## **Discussion**

How executives adopt and manipulate symbols plays an important role in the success and survival of their firms (Dutton and Dukerich 1991, Elsbach 1994). Yet, the extant literature on symbolic management has paid scarce attention to how executives manage their firms' membership in a market category. We identify market labels as an important resource that needs to be symbolically managed by showing that executives use market labels strategically to guide stakeholders' perception of their firm. Our findings show that executives do not accept market categories as prescribed classification brackets, but that they actively manage their firm's category membership depending on their perceptions of the label's connotations and denotations.

### **Antecedents of Executives' Labeling Strategies**

The study contributes to the emerging research on market labels by identifying antecedents to a wider range of executives' labeling strategies than has previously been appreciated in the literature. We find that, while firm capabilities may influence label use, they do not fully explain executives' labeling strategies. Rather, executives' perceptions of the label's ambiguity, denotation credibility and connotation value shape these strategies. These findings extend current theory in symbolic management and market categorization by looking beyond the explicit denotations of a label to consider the importance of a label's wider meaning.

First, in much of the symbolic management literature, ambiguity implicitly underlies and enables symbolic actions (e.g. Lounsbury and Glynn 2001, Zott and Huy 2007, Westphal and Zajac 1998). How ambiguity shapes symbolic management strategies has, however, been granted limited explicit attention, with few exceptions. Studies suggest that executives respond to ambiguity by actively attempting to influence participants' understanding of market concepts and by scanning the environment for more information (Weick 1995, Santos and Eisenhardt 2009). We extend this work

by showing that ambiguity evokes concern among executives of losing control over the meanings that a market label conveys about their firms to stakeholders. Executives monitor the possible corruption of the label's denotations to avoid an affiliation with a stigmatized category, while considering the label's changing connotations to safeguard against unwanted perceptions of the firm's activities. Executives, thus, attempt to manage the effects of ambiguity by assessing the meaning and stability of the market label while at the same time keeping an eye on the firms' desired market position.

Second, we find that executives consider whether using the label creates credibility gaps. Previous studies in symbolic management examine how specific symbolic actions add to firms' credibility in general (e.g. Zott and Huy 2007) rather than evaluate whether a specific action *per se* is credible for a particular firm in a given situation. We find that executives' perception of credibility influences their labeling strategies especially in ambiguous contexts that afford leeway to use labels decoupled from their firms' actual capabilities (also Alvesson 1990). Rather than capabilities, a mere resemblance may be sufficient for executives to credibly and legitimately claim membership in a category. Opinions differ about which firms rightfully belong to a nascent category, thereby confounding the determination of who engages in deception or the "willful delivery of false information" (Shulman 2007: 6). In contrast to other studies where conformers and offenders are clearly defined (Hudson and Okhuysen 2009, Phillips and Kim 2009), our findings indicate that such division is difficult to determine because who rightfully or deceitfully uses a label is negotiated among market participants. Previous research also suggests that organizations face a trade-off between gaining access to the affiliated resources and the risk of delegitimation due to the misleading use of symbols (Ashforth and Gibbs 1990). Our study stresses that by considering the credibility of their labeling strategies executives manage the delicate boundary between legitimate and illegitimate action.

### **Symbolic Management through Disassociation**

Studies have focused on how firms gain beneficial outcomes by claiming affiliations (Fiss and Zajac 2004, Westphal and Zajac 1998). We find that while claiming a label is a frequent strategy, two other labeling strategies involving aspects of negation are equally common, hedging and disassociating.

We find that ambiguity about a label undermines the usefulness of claiming and prompts executives to consider alternative strategies for denoting the firm. Yet, while our data show that in nascent markets hedging and disassociating are widely used in symbolically managing a firm's affiliation with a market category, such negation strategies have to date largely been overlooked in the literature.

Similar to Elsbach and Bhattacharya (2001) and Weber et al. (2008), we demonstrate that executives strive to manage perceptions of their firms by explicitly distancing the firms from certain labels. Both legitimation and delegitimation of labels can be swift in nascent markets (Glynn and Marquis 2004), making executives' ability to disassociate their firm from a market label essential to its survival. Overall, it is not surprising that executives in firms without label-related capabilities reject the label. We found, however, that such executives are forced to engage in active disassociating, because they perceive that stakeholders categorize their firms based on self-interest rather than firm capabilities. Our study shows that executives have to actively engage in disassociation in order to avoid inclusion in unwanted categories. Other executives disassociate from the label even though their firms have the necessary capabilities. Thus, rather than merely assessing firm capabilities and their fit with the label, executives evaluate the stability and sustenance of the label itself as a symbolic resource with value to the firm. Disassociation is a preferred strategy particularly for those executives who perceive that the label's denotations have been obfuscated by firms that lack the necessary technological capabilities. Disassociating allows executives to avoid affiliation with a potentially stigmatized category that in the future might generate unfavorable connotations and impair access to resources. As such, our study extends the work of Phillips and Kim (2009) and Hudson and Okhuysen (2009) by uncovering how executives assess and select legitimate labels over stigmatized ones to manage categorical memberships.

### **Hedging Membership in a Nascent Market Category**

Our findings on the hedging strategy have implications for the debate on the value for firms of being associated with multiple categories (Hsu 2006, Hannan et al. 2007). The market categorization literature has shown that firms face adverse consequences if they are perceived to belong to several categories simultaneously (Zuckerman 1999; 2000). Other empirical studies find that bridging

multiple categories can be advantageous (Padgett and Ansell 1993), particularly after actors have gained legitimacy (Zuckerman et al. 2003), and that “balancing” stakeholders’ interests is an important strategic response for firms when managing ambiguous environments (Oliver 1991, Fiss and Zajac 2006, Ruef and Patterson 2009).

Our study adds to these literatures by unpacking how executives can use ambiguity as a tool for symbolic management. First, adopting a hedging strategy affords distance, but not exclusion, from the categorical affiliation of a market label. As discussed above, signaling ambivalent category membership provides a means to manage the risk of deceitful use of a label and to safeguard against potential future dilution of the category. Second, in nascent markets, executives often manage affiliations with several markets simultaneously. Using multiple labels reflects executives’ struggle to make sense of their firms’ categorical membership. Hedging their bets allows them to postpone binding claims about any single market category. Third, by hedging, executives enable stakeholders to interpret the label depending on their own predispositions. Executives can use a nascent market label so that it is meaningful in a specific context, but not consistent across firms’ various activities or encounters with different stakeholders. As a result, executives attempt to satisfy the demands of stakeholders in multiple markets. We show that bridging multiple categories through hedging affords agility for executives to manage ambiguity and associated risks of nascent markets, making non-commitment to any market category a particularly valid strategy.

Extensive use of the hedging strategy, however, particularly when executives consistently overstate affiliation with the category, may affect the legitimation of the category itself. Studying Total Quality Management, Zbaracki (1998) showed that decoupling a label from reality can accelerate and ultimately challenge the legitimacy of a category (see also Isenberg 2001, Brunnermeier and Nagel 2004). Our findings add to this literature by suggesting that even inconsistent use of a label by firms without capabilities may have negative outcomes for the market formation. In our data, the use of the label by executives from firms without label related capabilities triggered disassociation by others, who perceived a diminished veracity in the label’s categorical reference. Non-substantive labeling practices can reinforce such perception of diminished veracity, creating a vicious cycle where disassociation by executives in firms with capabilities gives rise to

decoupling between substantive features and label use, thus creating further opportunities for executives in firms without capabilities to claim or hedge the label. Therefore, non-substantive label use can generate untenable expectations that may facilitate the collapse of a category.

Our study has implications beyond emerging domains of activity to other ambiguous contexts characterized by fluid categories including high velocity environments (e.g. Eisenhardt 1989b) and firms at the boundaries of stable industries (e.g. Chen and O'Mahony 2009) where executives make strategic decisions about how to position their firms within several possible categories. Similarly, more stable markets that experience a radical discontinuity also suffer from a fundamental shift and heightened ambiguity, where companies need to navigate novel market categories (Tushman and Anderson 1990, Suarez and Lanzolla 2008). Even established industries, such as telecommunications and pharmaceuticals, are under constant transformation as their boundaries flex to fit new technologies and organizations that associate themselves with the industry label. Further, the connotations of established market labels may change making an affiliation disadvantageous. For example, the multiple environmental and health scandals involving the chemical industry has made the "chemicals" label unfavorable (Hoffman 1999) leading many chemicals companies to consider other potential labels for their activities such as nanotechnology. A myriad of market labels cross the boundaries of several industries (e.g. green technology, cloud computing, and cosmeceuticals) and thus have an undefined and ambiguous character. Conclusively, most market contexts allow room for strategic use of market labels. By bridging the symbolic management and market categorization perspectives, our study, therefore, identifies important categorization dynamics and opens up several novel avenues for future research.

### **Future Research**

While our study substantially expands previous scholarly understandings of executives' market labeling strategies, it also uncovers numerous opportunities for further examination. First, future studies should further explicate categorization processes and dynamics of label use by integrating data on executives' and stakeholders' labeling activities. Our findings on the complexity of executives' perception and use of labels challenge the assumption that labels are simple, prescribed classification

brackets that mirror a firm's actual technological features (Hsu and Hannan 2005, Porac et al. 1995). Our findings also contest the view that categorization is guided only by stakeholders, who as a unanimous and knowledgeable entity place firms into category brackets (Hannan et al. 2007, McKendrick et al., 2003). In contrast, we propose that the categorization process is one of reciprocal influence (e.g. Ginzel et al. 1993) where executives' perceptions of labeling activities by stakeholders influence their own choice of labeling strategies, but also where stakeholders' categorization is tentative, driven by their interests, and negotiated with executives and other stakeholders. Future studies that combine data on both executives and stakeholders would clarify such reciprocal influences in market categorization, and would provide a deeper understanding of categorization processes.

Second, our study highlights how executives' perceptions shape their choice of a market labeling strategy. Future research could examine what causes executives to hold these perceptions in the first place. For example, executives who have experience with failed markets may perceive more ambiguity around a label's denotations and be more skeptical about the connotative value of emerging labels. Such executives may, therefore, be more likely to disassociate. Additionally, executives, who have been involved with firms that are affiliated with multiple industries may be more familiar with the larger system of market categorization and, therefore, be less likely to see the firm as belonging to only one category. Future research could investigate whether such executives are more likely to hedge.

Third, hedging is shown to be a viable strategy for managing ambiguity. While our research formulates several implications for its use, further research should attend to the hedging dynamics in different market contexts. A potentially fruitful approach is a longitudinal study examining the use of this strategy during a period where the stability and legitimacy of a nascent market label changes. Such a study could provide insight into how changes in the label's meaning influences executives' use of labeling strategies. Further, the very use of a hedging strategy provokes the question of its long term consequences – might markets where many firms employ a hedging strategy be negatively affected by this practice? Frequent use of hedging indicates that few firms are committed solely to the



novel category, which may make it more likely that the category eventually collapses. Studying these dynamics would shed novel light on market structure and their evolution.

Finally, examining the links between label use and industry emergence would provide an important perspective on category formation. This study shows that label use is not necessarily related to firm capabilities and that established firms reposition their existing activities by adopting new labels. We find that the use of market labels instead is intrinsically linked to executives' complex perceptions of the labels' connotations and denotations. Such labeling processes may play an important role in the emergence of markets. Future research on labels could further challenge the prevailing understanding that new industries form around substantive activities and dedicated novel firms.

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**TABLE 1 Executives' Labeling Strategies**

	<b>Claiming</b>	<b>Disassociating</b>	<b>Hedging</b>
<b><i>Name of firm</i></b>	<p>Using the label as part of the company, product or department name</p> <p><i>Examples:</i> Having “nano” as a pre- or suffix in the company name, like ZeptoNano or NanoVortex</p> <p>Establishing a department for “nanophotonics” and labeling a product as “Nano-Transmitter”</p>	<p>Stating that they chose explicitly not to have the label as part of the company, product or department name</p> <p><i>Examples:</i> “I consciously chose not to include “nano” in our name, or in our product names.”</p> <p>“We would never consider naming our department “nano”</p>	<p>Sometimes using the label as a part of the company, product or department name and at other times downplaying or denouncing this fact</p> <p><i>Examples:</i> Having “nano” as part of the name, but often presenting the firm via its acronym, which hides the nano-association</p> <p>Naming technology “nano-imprint lithography” instead of “imprint lithography”, but never otherwise claiming nanotechnology</p>
<b><i>Rhetoric practices</i></b>	<p>Explicitly associating the firm and the label or active promotion of the label.</p> <p><i>Examples:</i> “I position my firm as a nanotechnology firm.”</p> <p>“We say we are a nanotech company. Even on our company T-shirts.”</p>	<p>Denouncing a connection between the label and the firm</p> <p><i>Examples:</i> “I do not position my firm as a nanotechnology firm”</p> <p>“I do not use the nano-label to describe my firm.”</p>	<p>Explicitly claiming the label to some stakeholders while disassociating to others, or only implying a connection to the label</p> <p><i>Examples:</i> “I use ‘nano’ in association with my firm depending on what people want to hear”.</p> <p>“We have technologies that are at the nanoscale so we might be considered a nanotechnology firm.”</p>
<b><i>Non-verbal practices</i></b>	<p>Representing the firm in activities that carry the nano-label like conferences, networking events, directories, and magazines.</p> <p><i>Example:</i> “I attend many nanotechnology events because it helps put my firm on the radar-screen of possible investors.”</p>	<p>Refusing opportunities to participate in conferences, events and networking that carry the label as a heading, and monitoring that the firm does not participate in lists, directories, and magazines that use the nano-label.</p> <p><i>Example:</i> “I do not want anybody representing the firm to participate in nanotechnology conferences or networking events because I do not want to position my firm as in the nanotechnology space.”</p>	<p>Selecting a specific type of label related activities in which to participate while shunning others, and rhetorically denouncing the association between the firm and the label, but still participating in events that have the label as a heading.</p> <p><i>Example:</i> “I do not view my firm as a nano-firm, and I do not position the firm as such. But we often participate in nanotechnology conferences because it is a good place to gain visibility.”</p>

The proportion of respondents using each labeling strategy was not significantly different across the sample ( $X^2=2.475$ ;  $n=59$ ,  $p<0.52$ )

**TABLE 2 Examples: Executives' Perceptions of the Nano-Label**

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**Denotation and Connotation Ambiguity**

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Unfortunately I think "nano" has become misused. Anything that seems to be smaller than the normal product line they call "nano", like "nano-switches" as big as your watch. It's ridiculous. – Hayes, board member, Starplane

I'm a little bit more cynical on [nano] because when I was young it was called *mesoscale* science and technology. All the same stuff that people are now calling *nanoscale* science and technology and materials was then called mesoscale science and technology. – Halle, founder and CEO, Advanced NanoSupply

People do all these web analyses... and they come to think that a tremendous number of nano-firms have been established due to the explosive increase in the use of the "nano" word. However, web searches do not describe how the activities in this area have developed. Old firms have adopted the nano-prefix, or the entire name of the organization has changed... Before firms used another name for their technology; however, now they call it "nano". – Hakan, Chief Scientist, Celestial

I won't criticize specific individuals but when you have persons putting out research that is just exaggerated about the impact of nanotechnology on the world coming from folks less than 30-years of age plus or minus a few years who have never lived through any prior bubbles, and now attempting to believe that this bubble is any different than prior bubbles [in that it will not collapse]. I don't think they are necessarily doing the space a great service. - Dylan, founder and CEO, Supernova

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**Denotation Credibility**

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The question is whether we are a nanotech company? ... What are the dimensions you need to know? The chips we use now are one micron [1000 nanometers]. So, it is close [but not nanotech]. On the other hand, the layers in our chips are down to angstrom which is below nanometer. They are just a few nanometers thick. To that end, yes, we are a nanotech company. – Henrik, CEO, AtomProbe

A lot of the researchers aren't even defining themselves as doing nanoscale this or nanoscale that because the community and the funding are so heavily aligned with some of the other areas that they're better off just saying that they're doing celluloid science or polymer or something else anyway. – Halle, founder and CEO, Advanced NanoSupply

Merrill-Lynch came out with this nanotechnology index about the same time that they filed this Nanosys IPO and what you may have been seeing there is an attempt to create a new category in terms of a market segment or sector. - Casper, VP, NanoSense

They [an investment firm] would like to position themselves as having something to do with nano. They want some of their portfolios to be within nanotechnology and biotechnology and therefore it is a good for us to go out and say, "Well, this is nanotechnology, a sort of nanotechnology combined with biotechnology." - Hans, CTO, Picolever

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**Connotation Value**

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If you can put "nano" in an application for anything your chance of getting some money is much higher. – Hermione, founder, Quark.

Many people have abused the name of nanotechnology as a way of promoting something new because it is a sexy name in attracting attention. - Cyd, CTO & VP, Zepto

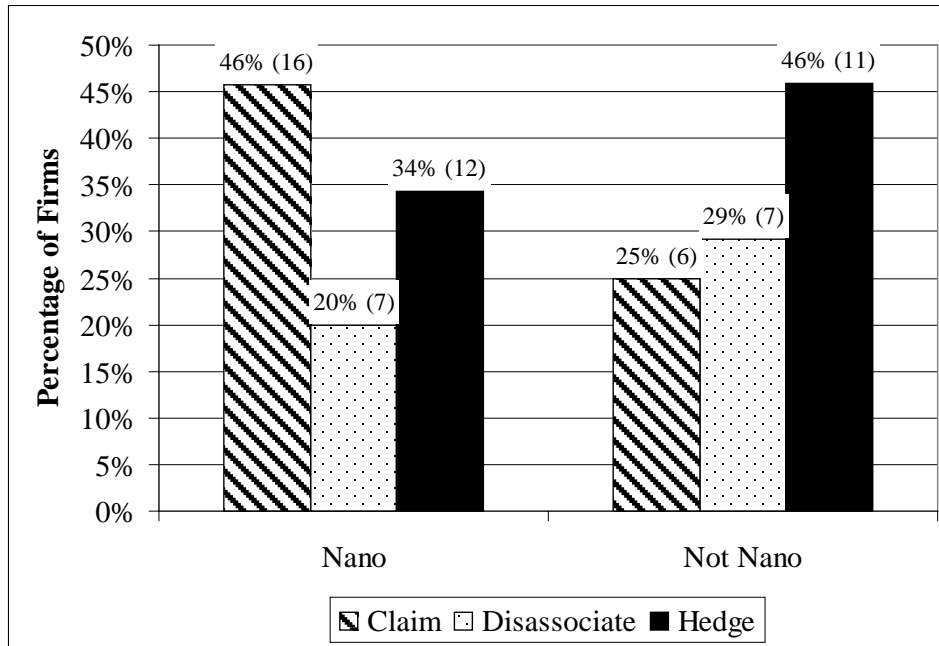
Some firms [that claim the nanolabel] have been established so that they could get funding from the nanotechnology programs. – Hakan, CSO, Celestial.

The main point is that when you do materials or catalysts, design or manufacturing, we have always been thinking nano. It is just now called nano, and because of the popularity of this area now it is much easier for us to collaborate with universities and get equipment for the task we actually wanted to do. - Clark, CEO, Nebula

So [nanotech] is a buzzword that people trigger on and a lot of other companies - like some of our customers want to have a part of this.... They want to get into this area and therefore it's a good buzzword to use 'nanotechnology.' – Hans, CTO, Picolever

I would say that we are a real nanotechnology company [...]. It is a very important part of the company that differentiates us from others that we are using statistics to really predict the nanomaterials properties on a nanoscale. – Cristofer, Chief Scientist, NanoCentauri

**FIGURE 1 Executives' Labeling Strategy by the Firm's Technological Capability**



The proportion of respondents using each labeling strategy was not significantly different across firm capabilities. ( $X^2=2.56$ ,  $n=59$ ,  $p<0.55$ )



**FIGURE 2 Framework for Executives' Labeling Strategies**

EXECUTIVES' PERCEPTIONS		EXECUTIVES' LABELING STRATEGY		
		CLAIM	HEDGE	DISASSOCIATE
<b>DENOTATION &amp; CONNOTATION AMBIGUITY</b>	Label's definition is unclear		● ○	
	Label's denotations and connotations are in flux		●	○
	Label's denotations and connotations are highly ambiguous and in flux			● ○
<b>DENOTATION CREDIBILITY</b>	Firm's activities resemble label; Stakeholders assign label to firm	●	○	
	Label signals an illegitimate affiliation; Stakeholders do not assign label to firm		●	○
<b>CONNOTATION VALUE</b>	Label creates access to resources; Label signals uniqueness	● ○		
	Label use induces negative perceptions of the firm			● ○

● Firms with label-related capabilities      ○ Firms without label-related capabilities