

ABSTRACT

The novelty of new products creates uncertainty for market participants, forcing them to evaluate the usefulness of new products relative to existing offerings. We theorize market participants engage in discourse – the objective information and subjective opinion exchanged in the marketplace – to determine the usefulness of new products. We develop theory to explain how the degree of novelty of new products impacts market discourse, which is used as a sensemaking mechanism to reduce uncertainty caused by the new products, and test the theory with data from the United States wireless telephone industry from 1998 to 2007. Results suggest a greater degree of new product novelty is associated with a longer duration, higher volume, and higher conflict of discourse. We also demonstrate the moderating effects of firm- and product-level characteristics, such as firm reputation, product price, and the introduction of new products by competitors, on the level and duration of market discourse.

INTRODUCTION

A significant body of management research has been developed on market discourse, defined as the publicly available objective information and subjective opinion exchanged in the marketplace. In particular, researchers have studied the impact of public discourse on market entry decisions (Lee & Paruchuri, 2008), competitive interactions (Kennedy, 2005; 2008), the diffusion of innovations (Rogers, 1995), management practices (Abrahamson & Fairchild, 1999), institutions (Phillips, Lawrence, & Hardy, 2004), and categorization (Rosa, Porac, Runser-Spanjol, & Saxon, 1999). While there has been substantial work on the effects of market discourse, scant research exists regarding the antecedents or determinants of discourse. The lack of study of discourse antecedents is an important deficiency and gap in the literature given the prominence of research in linking discourse to organization outcomes. In particular, to the best of our knowledge, the question of how new product novelty influences discourse has not been addressed. We theorize the introduction of a novel new product forces market participants to engage in the process of discourse as a sensemaking mechanism to determine the new product's usefulness.

Rogers (1995) and Weick (1995) have argued that public discourse is a key sensemaking mechanism to help market participants reduce uncertainty surrounding "surprises" in the market. Rogers (1995) outlined four main elements of the diffusion of innovations in the marketplace: the innovation itself, communication regarding that innovation, time for that communication to develop, and a social system where the communication occurs. Through this process, the market makes a decision regarding the usefulness of particular innovations. If judged useful, the innovation will be accepted; otherwise, the innovation may be rejected. In essence, then, the decision making process among market participants of accepting or rejecting a new product

based on its usefulness closely matches the individual sensemaking process. Specifically, the innovation or new product acts as the “surprise” to trigger the diffusion/sensemaking process.

The focus of this paper is to explain two key aspects of discourse – duration and volume – surrounding the introduction of new products. Duration reflects how long the discourse lasts and is operationalized as the difference in time between the first mention of the product in the market and the last mention. Volume is the cumulative amount of communication that focuses on a particular new product and captures the total magnitude of discourse (Kennedy, 2008; Lee & Paruchuri, 2008; Rosa et al., 1999). Combined, we argue these two concepts capture the sensemaking aspects of market discourse, with a high volume of discourse that lasts a longer time demonstrating the market is actively discussing and attempting to make sense of the new product. We specifically study the effects of new product novelty or how “new” the product is on the duration and volume of subsequent market discourse. A novel product contains something that has been created and is original (Cambridge, 2007). We measure novelty in terms of how “new” a product is relative to existing products (e.g. Fang, 2008b; Giachetti & Lampel, 2010; Katila, 2002; Martin & Mitchell, 1998; Sethi, Smith, & Park, 2001b; Wu, Balasubramanian, & Mahajan, 2004). We contend that the discourse process allows consumers and other interested stakeholders to learn of and evaluate a product’s usefulness. Specifically, the following research questions are addressed: How does the novelty of a new product affect market discourse? How does a firm’s reputation and product pricing influence the relationship between new product novelty and market discourse? Finally, do the effects of novelty on market discourse vary with the introduction of new products by competitors?

This paper makes several contributions. First, we develop theory to explain the process of market discourse that surrounds the introduction of a novel product. While the diffusion

literature focuses on how new products are accepted, spread, and are imitated through a market over time, our focus is on how novelty of each particular new product innovation generates discourse among an interested set of stakeholders. As opposed to prior research, which has demonstrated the importance of discourse to many organization outcomes, our intent is to explain the antecedents to variation in discourse that surrounds a “surprise” in the market: a novel new product. Improving our understanding of the predictors of market discourse is critical if one is to understand and manage its consequences. In addition, given the importance of new product introductions to organizations (Brown & Eisenhardt, 1995; Burgelman, 1991; Damanpour, 1991; Smith, Collins, & Clark, 2005) it is also critical to understand how the level of novelty in a new product is evaluated by market participants

Next, we specifically investigate how discourse acts as a central mechanism in the sensemaking process of market participants when confronted with new information encapsulated by new product introductions, which is especially important as those products increase in novelty. Although sensemaking has been theorized at the macro level and examined at the individual level (Weick, 1995), we shed light on how the market in general uses discourse to reduce uncertainty caused by changes in the market, specifically focused on novel new products by firms. Instead of viewing discourse surrounding novel new products as a result of media attention, we examine discourse as a key element in the uncertainty-reducing sensemaking activities of market participants.

Finally, our research also contributes by focusing on a set of factors that moderate the new product novelty-discourse relationship. In particular, we explain how firm reputation, product pricing, and competitor offerings occurring during the discourse act to moderate this process by providing information in addition to the product itself, serving as either signals of

quality or noise in the market process. Thus, in addition to theorizing about the discourse process, we develop new theory to explain how stakeholders use firm- and product-level characteristics as signals to learn and make sense of a new product's usefulness. Given the importance of discourse to a variety of organization outcomes, improved understanding of the moderators of discourse is also imperative if firms are to properly manage the process. Importantly, anecdotal evidence has shown there is more to new product success than the objective characteristics of the product itself (e.g., Sony's Betamax and JVC's VCR); competitors can intervene in the process, and stakeholders may be swayed by other subjective market signals. Examining product novelty as an objective measure and the subjective market process of product opinion formation is critical to understanding successful product introductions.

THEORETICAL BACKGROUND

Market Discourse

In this research, the market process where stakeholders evaluate and learn of a product's usefulness is portrayed as an individual and group sensemaking activity by various market participants with market discourse as a critical element. Although sensemaking can occur at the individual level, the collective nature of market discourse among alternative stakeholders helps form opinions by the market as a whole and is integral to understanding the impact of new product introductions. Weick (1995) explained sensemaking in the following way: it begins with an unexpected event or surprise, it is retrospective in that sensemakers offer plausible explanations and implications of the surprise, and those speculations are presented in a tangible medium. Matching Weick's description, in this paper the "surprise" is the novel new product, the retrospection is the evaluative process of dealing with the uncertainty regarding the

usefulness of the new product, and market discourse is the tangible outcome of the sensemaking activities of market participants. Sensemaking thus becomes, “publicized speculation that makes an unexpected or unfamiliar thing more plausible” (Kennedy, 2008:272; see also Weick, 1995:3), expressed via market discourse. Thomas, Clark, and Gioia (1993) similarly described sensemaking as “the reciprocal interaction of information seeking, meaning ascription, and action” (pg. 240).

According to Social Information Processing Theory (Salancik & Pfeffer, 1978), people use communication to interpret and understand events, which can also lead to socially constructed perceptions (see also Festinger, 1954). Scholars of conflict, particularly socio-cognitive conflict, have assumed that people in a state of conflict have a desire to reduce that conflict, with communication being an important mechanism to do so (De Dreu & Gelfand, 2008). Political scientists have also studied public opinion, and the convergence of this opinion is a condition stable societies reach by adapting to changing circumstances via discussion and debate (Price, 1992). In addition, sociologists have argued for the political aspects of market dynamics (e.g. Fligstein, 1996) and how integral discourse is when dealing with market forces. These varying theoretical perspectives of social information processing, conflict, and political science as well as the diverse approaches to discourse all highlight the need for discussion and debate to form public opinion (e.g. Blumer, 1947; Price, 1992) and, in fact, “fundamental to these theories is the notion that members of a public organize collectively through communication over a point of conflict” (Price, 1988: 659). Thus, through the process of engaging in discourse, market participants are able to use objective and subjective information surrounding new products based on the thoughts, opinions, experiences, and expressions of others to help deal with and interpret the usefulness and value of a novel new product. The

process begins with a “surprise” created by the novelty of a new product and ends with formation of opinions in which some market groups view the product as useful and others may conclude it is less useful. When conclusions emerge and opinions coalesce, the discourse process will end.

In this way, discourse becomes a central element to the sensemaking process. Weick (1995) included the creation of “text-like cues” to aid in the interpretation of external events, where the revision of these interpretations depends in part on the actions and consequences of those actions. Kahlbaugh (1993) argued that, “Our intentions and feelings do not grow within us but between us [A]n individual creates novel thoughts in the context of interactions with others, and then communicates them to the larger community. If viable, the larger community generalizes these ideas such that they become part of the culture” (pg. 80, 99). It is therefore through the discursive process that sensemaking occurs and generalized opinions and consensus may result.

Although various definitions of the concept of discourse have been used in prior research, discourse has consistently been characterized as a form of verbal and written communication that persists and works to construct a reality based on the social interpretations by discursive participants (e.g. Phillips et al., 2004). Accordingly, in this paper, the working definition of discourse is publicly available texts that capture written and verbal communication used to express objective information and subjective opinion, which can then be used as a sensemaking mechanism to reduce uncertainty caused by novel new products. From a general market viewpoint, discourse is manifested in media outlets, such as the popular press, local newspapers, and general business magazines (e.g. Lee & Paruchuri, 2008; Phillips et al., 2004; Rosa et al., 1999). Note that at least initially, variation in opinion can be quite extreme and debate can be rampant, until such time where opinion coalesces into a common viewpoint.

New Product Novelty and Market Discourse

Innovation has generally been defined as the development and implementation of new ideas or behaviors relating to products, services, operational and administrative structures, processes and/or systems (Daft, 1978; Damanpour & Evan, 1984; Subramanian & Nilakanta, 1996). In addition, innovation has been described as, “An iterative process initiated by the perception of a new market and/or new service opportunity for a technology-based invention which leads to development, production, and marketing tasks striving for the commercial success of the invention.” (Garcia & Calantone, 2002:112; OECD, 1991). As this definition indicates, innovation is a matter of perception, as what is “new and innovative” to one party may not be so to another (Hoeffler, 2003; Rogers, 1995). Regardless, “novelty” has most frequently been used as a measure of the degree of newness of an innovation (Amabile, 1996) and when applied to new product introductions, especially examines how the focal product differs with respect to product features and attributes relative to other existing product offerings (e.g. Fang, 2008b; Katila, 2002; Martin & Mitchell, 1998; Sethi et al., 2001b; Wu et al., 2004).

Discourse focused specifically on the acceptance or rejection of new products and innovations has been the topic of some prior research. In particular, the diffusion of innovation research has focused on how new products or innovations are accepted or rejected by market participants (Rogers, 1995). Rogers (1995) conceptualized communication of innovations as an exchange or creation of perspectives between two or more parties for the purpose of reaching a “mutual understanding.” Implicit in this conceptualization is the idea of convergence – or divergence – as two or more individuals exchange information in order to move toward each other – or apart – in the meanings they give to certain innovations. As new products by definition are unproven and are thus surrounded by uncertainty, various market participants will

initially have diverging views regarding that innovation and will seek information in order to reduce their uncertainty. The evaluation of a new innovation by interested stakeholders, then, is an information-seeking and information-processing activity in which market participants create and receive information in order to decrease uncertainty about the innovation (Rogers, 1995).

Rogers (1995) argued the knowledge stage is most appropriate for objective characteristics of the innovation, while the persuasion stage focuses on subjective information. A combination of both objective and subjective information reflecting public opinion may be needed for market participants to make an informed decision regarding the usefulness of an innovation, depending on the individual characteristics of the particular participant. In essence, market discourse captures in a publicly available medium the conversations occurring in the marketplace about newly introduced products (Kennedy, 2008) and is the manifestation of the cognitive processes vital to the acceptance or rejection of a new technology (Kaplan & Tripsas, 2008). In this way, discourse not only disseminates information but also helps to form market opinion and is a central mechanism in the sensemaking and overall market process (e.g. Abrahamson & Fairchild, 1999; Fiss & Hirsch, 2005; Kennedy, 2005; Lounsbury & Glynn, 2001; Rao, 1994; Rosa et al., 1999; Weick, 1995). Although discourse can initially increase uncertainty due to the contrasting opinions of the various market participants, the discursive process can help those participants remove uncertainty, even if consensus is not obtained. In other words, although some may choose to view a product as useful and some may not, the divergence of opinions may not be resolved, but the uncertainty of not knowing whether to accept or reject the new product for individual participants will be attenuated. The collective action of a decision of a product's usefulness by the market can then lead to the abandonment or updating of current – or the creation of entirely new – market beliefs of a product's usefulness.

A point of departure for our study, relative to the diffusion of innovation literature, is that we study the effects of new product novelty as part of the market discourse process. A novel product contains something that has been created and is original (Cambridge, 2007). Product novelty has been commonly studied as the deviation in a new product from the current state of the market, in other words the degree to which the new product differ from other existing products in its category (e.g. Fang, 2008a; Lau, Yam, & Tang, 2011; Sethi, Smith, & Park, 2001a; Talke, Salomo, Wieringa, & Lutz, 2009). Thus, we operationalize novelty in terms of how “new” a product is, both in terms of new features and within feature categories, relative to existing products (Chakrabarti, 2009). Following Chakrabarti (2009), if no other new product has a particular feature or characteristic, the new product would be depicted as more novel. On the other hand, if a particular new product were not different from existing products in terms of product features and characteristics, it would be considered less novel.

THEORY AND HYPOTHESES

Our model first explores how the level of new product novelty directly impacts market discourse. Then, we theorize how firm reputation, product pricing, and competitors’ new product introductions act as moderators to the relationship between new product novelty and its subsequent market discourse.

Novelty

New products and services drive economic development, dynamically shape the business environment, and impact the evolution of industrial markets (Kirzner, 1973; Schumpeter, 1934; Shane & Venkataraman, 2000). New products emerge from a nexus of entrepreneur and opportunity (Shane, 2003), as managers seek to gain a competitive advantage for their firm by

identifying opportunities to disrupt, alter, or stimulate the market. However, a great deal of uncertainty exists surrounding the introduction of a new product, as the reaction by the market towards the new product is unknown at the time of introduction. Indeed, this form of new product activity has been described as “a voyage of exploration into the unknown” (Hayek, 1949) and as an “economic experiment,” the outcomes of which are “fraught with uncertainty” (Rosenberg, 1992: 186-187) and are risky and unpredictable (March, 1991).

Innovative products have varying degrees of “newness” or “destructive” capacity (Schumpeter, 1942) and therefore impact the market in different ways. Newness is a relative concept; the level of “newness” is determined by how the features and characteristics of the new product compare to existing products (e.g. Fang, 2008b; Katila, 2002; Martin & Mitchell, 1998; Sethi et al., 2001b; Wu et al., 2004). The level of “newness” will be positively related to the market uncertainty, in turn raising the level of market discourse. As noted, each new product is surrounded by a certain amount of “new” information that may or may not be consistent with current market beliefs, opinions, and expectations regarding the best or most appropriate use of the product (Hayek, 1949; Kirzner, 1973). As a result, market participants must react to this new information as they evaluate the product’s usefulness, generating market discourse. It follows that a greater degree of novelty of a new product will generate discourse of higher duration and volume as the market attempts to make sense of the new product.

Fiske and Taylor’s (1991) review of the social cognition literature alluded to the importance of new products as a catalyst to the market process, noting that we pay particular attention to: “things that are novel or perceptually figural in context, people or behaviors that are unusual or unexpected, behaviors that are extreme and (sometimes) negative, and stimuli relevant to our current goals (pg. 265).” When confronted with information that is different than

current beliefs, market participants who are uncertain of the usefulness of the new product must react, with “doing nothing” viewed as an action of rejection. As discussed above, when uncertainty is caused by the new information, market participants seek both objective and subjective information to help resolve this uncertainty (Rogers, 1995). The greater the novelty in a new product, the more uncertainty exists (Hoeffler, 2003) and the more possible interpretations exist, which leads to a higher degree of uncertainty for market participants. This higher level of uncertainty will lead to more intense discourse as participants are less likely to quickly and easily categorize it with existing schemas and belief systems (Hargadon & Douglas, 2001; Smith & Cao, 2007). As such, the discourse of the market is more likely to reflect the debate surrounding the meaning, application, and/or usefulness of the new product.

Similarly, the more innovative the new product and thus the more uncertainty that exists, the longer it will take for the market to reach a consensus regarding the acceptance or rejection of the new product. One manifestation of this lack of consensus and an indication of the conflict that exists among and between market participants is the tenor of market discourse, which is based on the opinions of the participants. The tenor of the market discourse can be predominantly positive or negative, depending on whether the market as a whole accepts or rejects the new product. The more innovative the entrepreneurial action, the more uncertainty is introduced into the market (Hoeffler, 2003), which will lead to a greater degree of conflict and varying of market opinion (De Dreu & Gelfand, 2008), as some market participants are better able to understand and to accept the new product than others (Rogers, 1995). As such, I would expect the tenor of the market discourse to have a higher degree to variance when the entrepreneurial action is of a more innovative or destructive nature. Accordingly, we expect the following:

Hypothesis 1. The greater the degree of novelty of a new product, the greater the duration, volume, and conflict of market discourse.

Reputation

The next hypothesis predicts that firm reputation will moderate the relationship between the novelty of a new product and discourse duration and volume. Reputation is defined as, “stakeholders’ perceptions about an organization’s ability to create value relative to competitors” (Rindova, Williamson, Petkova, & Sever, 2005: 1033). As a general rule, market participants will have some pre-formed opinion of a firm’s prior products, from which they can evaluate the usefulness of a new product. Categorization theory suggests that market participants have formed representative categories or “world views” based on prior experience with a product or service (Fiske & Taylor, 1991; Gregan-Paxton, Hoeffler, & Zhao, 2005; Porac & Thomas, 1994). A category representation is information that has been stored in a cognitive system, from which market participants make sense of different new products and services. This categorical representation is used to process and make sense of new information (Loken, Barsalou, & Joiner, 2008) typically introduced by new product features and functionalities. For example, market participants initially categorized cell phones as devices for communicating based on their prior understanding of land-line telephones. More recent cell phones were categorized as cameras and then smart phones that process data and are connected to email and the internet. Therefore, the evolution of the cell phone industry required market participants to constantly update their representative product categories. But, as suggested, this is an uncertain process that is constantly evolving and, as such, market participants will search for signals to help them categorize the new information.

A firm's reputation can serve as an indicator of quality and therefore aid in categorization. For example, the prior reputation of Apple Computer as an innovator in new products helped market participants classify and evaluate the initial iPhones. Therefore, we expect the relationship between new product novelty and discourse to be moderated by the introducing firm's reputation. Reputation can serve to increase the amount of information the market has about a firm and its actions (Weigelt & Camerer, 1988). For example, when a firm introduces a new product, the history of its prior products will impact how customers view the new product, especially in the absence of perfect information. Reputation helps establish a pattern of expectations and can thus become a substitute for further information. In other words, in the absence of complete information, a customer can use the reputation of the firm to help judge and make sense of a subsequent new product introduction (Clark & Montgomery, 1998; Fombrun & Shanley, 1990; Weigelt & Camerer, 1988). All else equal, the new product of a firm with a positive reputation for product quality, innovativeness, and value will be better received than an offering from a firm lacking such a reputation. As a result, when a firm introduces a novel new product with no prior reputation or with a reputation that is negative, market participants will tend to increase the level of discourse to resolve the uncertainty.

As noted, when a new product is introduced, market participants will face uncertainty about the new product's usefulness, and we argue that this uncertainty will increase with the level of novelty. We contend that when faced with very novel products generating high levels of uncertainty, market participants will search for other signals and information to evaluate the new product as informational cues to reduce this uncertainty. In the context of very novel products and resultant uncertainty, a firm's prior reputation may help reduce uncertainty surrounding its novel new products, as participants already have a base level of information from which to work.

In this sense, the level of a firm's reputation may help to attenuate the amount of sensemaking and thus discourse required for its novel new products. Otherwise stated, reputation may become a substitute for discourse as it lessens uncertainty and the need for sensemaking¹. As such, the following is hypothesized:

Hypothesis 2. Reputation will negatively moderate the relationship between the novelty of a new product and the duration, volume, and conflict of market discourse; in other words, the positive impact of novelty on market discourse will be lessened when reputation of the firm increases.

Price

We also theorize a new product's price will moderate the relationship between new product novelty and market discourse. When evaluating a new product and ascertaining its usefulness, market participants attempt to determine the quality of the product and therefore seek information about its underlying characteristics. Especially in the case of highly complex or technologically sophisticated products – such as cellular telephones – determining quality is even more challenging. The price of the product has long been perceived as a signal of quality (Kirchler, Fischer, & Holzl, 2010; Leavitt, 1954) and price has been argued to be a time-saving heuristic, especially with more complex products (Kirchler, 2003). Research has shown that despite a link between price and “objective” or actual quality of a product, the price-*perceived* quality relationship is real in the minds of market participants (see Rao & Monroe, 1989 for a review).

This price-*perceived* product quality heuristic is expected to especially come into play when market participants are confronted with a very novel new product. Because novel products

¹ This logic may be somewhat counterintuitive, as one could argue that higher reputation would lead to more media attention, which would be manifest by more intense market discourse (Hayward, Rindova, & Pollock, 2004). However, this is not an examination of media attention but rather one focused on sensemaking, and from a sensemaking perspective one would expect the increased information gained from firm reputation to act as a substitute for discourse as a sensemaking mechanism, thereby reducing the necessity to utilize discourse as a sensemaking activity.

are innovative, relatively little information about their quality is known a priori. This will be especially true in the case with novel products that are sharply different from prior product offerings. In these instances, we contend that price may become a substitute for the need for market discourse because the market participants are relying on price as a primary source of information. In contrast, a very novel new product with a relatively low price may accelerate the need for market discourse because very novel new products with low prices could indicate low quality and low usefulness. Therefore, it is expected that the higher the price of a product, the lower the need for subsequent market discourse, especially for more novel products. More formally,

Hypothesis 3. Price will negatively moderate the relationship between the novelty of a new product and the duration, volume, and conflict of market discourse; in other words, the positive impact of novelty on market discourse will be lessened when product price increases.

Competitors' New Products

In isolation, each new product introduced by a focal firm would receive the full attention by stakeholders to evaluate its usefulness. However, competitors may introduce their own new products around the same time as the focal firm, which creates “noise” in the market. Smith, Grimm, and Gannon (1992) used communication theory, which emphasizes information processing of communicators (Shannon & Weaver, 1949), to explain how the effectiveness of a firm’s own actions can be disrupted by rival actions. They argued that in a competitive system there will be limited attention capability of stakeholders and when more actions exist, a division of stakeholder attention will occur. As such, discourse may be divided among competitors when there are numerous new product introductions at the same time. In such a system, extremely novel products will have an advantage in attracting stakeholder attention relative to less novel products. In studies of performance, Lee and colleagues (2000) found that the effect of rivals’

new product imitation of the product introducer diminished stock prices, and Derfus and colleagues (2008) observed that actions of a focal firm that increased the firm's performance were followed by actions by rivals.

The above arguments suggest that competitors' new products could aid in categorization to help the stakeholders make sense of new products, thus lowering the level of discourse. For example, market participants would now have something to compare the new phone to, and thus market discourse would decrease (Fiske & Taylor, 1991; Porac & Thomas, 1994). However, for new products that are novel and therefore unlike other phones previously released in the market, a high degree of uncertainty will result because of the relatively fewer points of comparison based on the new phone's characteristics and attributes. This increase in uncertainty will require more discourse to help make sense of the new product, which will result in a longer duration and higher volume of market discourse. As such, we predict the following:

Hypothesis 4. Competitors' new products will positively moderate the relationship between the novelty of a new product and the duration, volume, and conflict of market discourse; in other words, the positive impact of novelty on market discourse will be strengthened when more new products are introduced by competitors.

Figure 1 portrays a graphical representation of the hypothesized relationships.

 Insert Figure 1 about here

RESEARCH METHODS

Empirical setting: The wireless telephone industry

The setting for this study is the wireless telephone industry between 1998 and 2007. In 1996, the United States introduced the Telecom Industry Act, which largely deregulated the wireless industry. Prior to that point, the Federal Communications Commission (FCC) had

mandated only two wireless telephone companies per geographical region, which it believed was sufficient to stimulate competition and therefore benefit customers. Subsequent to deregulation, the wireless telephone industry grew rapidly, with many innovations, market entrants, and services introduced to the market, which makes this high-velocity, dynamic environment especially appropriate for the study of new product novelty and market uncertainty.

Specifically, new cell phones introduced by the following top six firms (including those firms that were merged or acquired during the study period) that made up approximately 90% or greater of the US wireless industry during the time of study were the focus of our analysis:

AT&T (Cingular, Dobson Communications, SBC, Bellsouth, and Centennial Wireless), Verizon (Airtouch, US West, Palmer Wireless, Price Communications, Bell Atlantic Mobile, GTE Mobilnet, and Rural Wireless), Sprint (Nextel, Qwest, Alamosa PCS, US Unwired, AirGate PCS, Ubiquitel, and iPCS), T-mobile USA (Voicestream, PowerTel, and SunCom Wireless), Alltel (360 Communications, Western Wireless, Aliant Communications, and Midwest Wireless), and US Cellular (PrimeCo).

Data collection procedures

An FCC database was used to identify new product introductions. The FCC is an independent United States government agency, regulating interstate and international communications by radio, television, wire, satellite, and cable and its jurisdiction covers the 50 states, the District of Columbia, and U.S. possessions. The FCC's Office of Engineering and Technology (OET) certifies all mobile phones intended for use in the U.S., insuring compliance with spectrum allocations, technical standards, and safe SAR (radiation) levels. As such, the FCC maintains a database of all new phones approved for use in the United States, which are

given a specific grant number. Using this database as a starting point, all new handsets approved for release in the United States by the FCC were identified².

Once these initial new products were identified, specific information regarding the features and characteristics of each new handset was gathered, primarily from four sources. Phonescoop, an independent researcher of the wireless telephone industry, has developed a set of key wireless phone characteristics and maintains a database of these characteristics, beginning in 2002. We used the Phonescoop data as a basis of ascertaining the novelty of each new product introduced in 2002 or later (see the Appendix for a list of all relevant phone characteristics used to calculate novelty and a description below for how this variable was calculated). For earlier new product introductions, we utilized the Phonescoop template regarding key characteristics, and filled in data on these characteristics primarily from user manuals submitted to the FCC as part of the approval process. In addition, we utilized two alternative sources, Wireless Week and RCR Wireless, to triangulate new phone characteristics. Wireless Week is a weekly magazine that began in 1995 and highlights all relevant activity in the wireless industry in the United States via daily online news briefs, beginning on May 5, 2000. RCR Wireless is an online source that also tracks events relating to the wireless telephone industry, and has a database of articles dating back to 1994. All of these sources are approved and recommended by the Cellular Telephone Industry Association (CTIA), established in 1983 in Washington, DC and widely known as the leading trade organization for the wireless telephone industry. Using these three online archives, as well as information from the FCC database and product-specific user manuals, all relevant

² Pursuant to FCC regulation 47 CFR 2.1043, all changes to equipment, other than “minor cosmetic changes,” are subject to FCC approval for sale and use in the United States, and are given a unique FCC identification number. Therefore, using this database as the starting point for our data collection helps to ensure the phones in our study are “new” models, which aids in our calculation of novelty, as explained below.

phone features were identified and cross-validated to the grant information on each phone contained in the FCC database.

The model numbers of the phones identified in the FCC database and cross-referenced with the three sources mentioned above were then used as “keywords” in Factiva, which is part of the *Dow Jones Interactive* database and was the primary source to capture the discourse related to that specific product (e.g. Desai, 2011; Fiss & Hirsch, 2005; Lavie, Lechner, & Singh, 2007). Factiva offers access to approximately 28,000 information sources, including newspapers, journals, magazines, and trade-specific press, and provides a comprehensive repository of market discourse. The researchers scanned the articles identified by the keywords to confirm they were related to the new cell phone of interest and then captured the duration and volume of the discourse as well as the carrier of the phone and the initial price offered.

Data on all new products in the FCC database and their corresponding phone-level characteristics were collected from 1998 through 2009, but only new products introduced up to the end of 2007 are included to allow the discourse related to those products to be properly analyzed. Some right truncation of the discourse will occur because there could be a small amount of discourse which extends beyond two years. For consistency across the sample, we allow a maximum of two years for discourse for all phones in the database. See further description of the variables of interest below.

Variables

Dependent variables.

Duration is a measure of how long the discourse related to a particular new phone lasted. To calculate this, the date of the first article to mention the focal phone was subtracted from the date of the last article to mention the focal phone, which resulted in a count variable of the

number of days the phone was discussed by market participants. As discussed above, we capped duration at 730 days for all phones in our sample. *Volume* represents a count variable of the total number of articles that referenced a particular phone in the first two years after introduction and is consistent with prior research (e.g. Kennedy, 2008; Lee & Paruchuri, 2008; Rosa et al., 1999). Models with each dependent variable were run independently and are included in the results section below.

Conflict: We analyzed the relative positive and negative affective language used in each article to capture the subjective opinion component of discourse using the Linguistic Inquiry Word Count (LIWC) program and its dictionary of more than 900 affective words with positive and negative tenor to code all articles related to each entrepreneurial action (Duriau, Reger, & Pfarrer, 2007; Pfarrer, Pollock, & Rindova, 2010). LIWC is able to calculate the degree to which people use different categories of words across a wide array of texts. Within emails, speeches, poems, or transcribed daily speech, LIWC determines the rate at which the authors/speakers use positive or negative emotion words, self-references, big words, or words that refer to sex, eating, or religion. LIWC maintains a dictionary with 2,300 words across 74 categories and four dimensions (Standard Linguistics, Psychological—emotion, cognition, sensory, social; Relativity—time/space; and Personal—job/leisure/religion/money/health). Using the positive and negative tenor results from the LIWC analysis, we then calculated the range in the tenor to demonstrate uncertainty for market participants; an increase in the range between positive and negative tenor demonstrates the lack of consensus in the market and therefore conflict. If the tenor were predominantly positive or negative, this would indicate the market has already reached a consensus and the range of tenor would be low.

Independent variables.

To test Hypotheses 1-4, we used the following independent variables:

Novelty: The main predictor variable is the degree of novelty for each new phone. Extant research on the novelty or innovativeness of new product introductions have primarily employed surveys (e.g. Fang, 2008b; Hoeffler, 2003; Moorman, 1998; Sethi et al., 2001b; Wu et al., 2004) or a panel of “experts” (e.g. Giachetti & Lampel, 2010) to ascertain relative differences between the focal new product and existing products based on a narrow sample and on pre-selected characteristics. However, in our study, we conducted an objective and comprehensive analysis of all phones in the U.S. wireless telephone industry. Therefore, our measure of novelty does not rely on subjective evaluations.

Another method prior research has used to examine the relative difference between multi-dimensional assets is the Jaffe measure, which uses vectors to measure the distance between observations (Jaffe, 1986), for example, a set of vectors for existing phones relative to each new product introduction. Sampson (2007) used the Jaffe measure to compute the relative technological diversity of patent portfolios between dyadic alliance partners, and our measure is similar to Sampson. Yet because we were not comparing dyadic innovation items, but were instead interested in determining the relative novelty that is objective and comparable across several hundred observations, this form of the Jaffe measure would not be suitable for our study. Therefore, we adapted the Jaffe measure to encompass multiple phone characteristics, in order to capture the relative difference of each new phone’s collective characteristics compared to all other previously released phones. More specifically, 79 product category characteristics (i.e. antenna type, camera resolution, weight, screen size, and so forth – see full list in the Appendix) were identified from Phonescoop.com, Wireless Week, RCR Wireless, and user manuals (Giachetti & Lampel, 2010). To the extent possible, the data were kept intact as continuous

variables but where the data were not continuous, categorical variables were created based on natural groupings in the data (Katila, 2002; Martin & Mitchell, 1998). For those characteristics where no natural or logical groupings could be identified, dummy variables were created for having that particular feature or not and novelty was calculated in the same manner as the categorical variables, but with only two categories.

Once the data were organized chronologically, a novelty score was calculated for each phone that captured the relative difference for each category in the database (excluding the first phone in the database as there was no other phone for comparison) for all phones previously released in the market. To do this for continuous variables, the focal phone was compared to a running average of all other previously released phones' values for that particular characteristic. For categorical variables, the ratio of how many other phones already released in the database that had that particular type of feature was calculated, which in effect gave us a relative frequency score for that characteristic; one minus that score was used to arrive at the relative novelty of that phone's characteristic for that category. Finally, the novelty scores for each phone across all product characteristic categories were averaged to arrive at an overall novelty measure that is both quantitative and comparable across all phones in the database. Naturally, over time the number of categories where a new product could be novel increased over time from 39 to 79.

To further elucidate how the novelty score was calculated, we provide details of the calculation of the novelty scores for two phones, with the simplification that for these examples only two of the 79 characteristics will be considered. More specifically, the following two phones were selected from the database and the novelty for weight (continuous) and antenna type (categorical) are presented (see Figure 2 below): The LG Migo VX-1000, released in 2005, and

the Samsung SCH-A930, released in 2006. The Migo had a weight of 2.46 ounces and an antenna type of 4. For weight, we took 2.46 ounces and subtracted the average weight of all other previously released phones, and then divided that number by that same number of the average weight of all other previously released phones to produce a comparable ratio. The absolute value of this calculation was .3963 and represented the novelty for this phone on this particular characteristic. For antenna type, four different forms were possible (internal, external, external extendable, and internal/external) and thus were coded 1-4 in the database, respectively. At the time of release of the Migo, there were 13 phones that had been previously released with a type of 1, 222 phones with a type 2, 160 phones with a type 3, and 170 phones with a type 4, yielding a relative rounded frequency of 2%, 39%, 28%, and 30%, respectively. One minus the relative frequency for type 4 produced a value of .6991, which was the novelty score for this phone in this category. This same process was repeated for all applicable 79 phone characteristic categories, and these scores were averaged, yielding an overall novelty score of .3651 for the Migo.

The SCH-A930 had a weight of 3.98 ounces and an antenna type of 2. For weight, we took 3.98 and subtracted the average weight of all other previously released phones, and then divided that number by that same number of the average weight of all other previously released phones to produce a comparable ratio. The absolute value of this calculation was .0138. For antenna type, at the time of release, there were 13 phones that had been previously released with a type of 1, 280 phones with a type 2, 172 phones with a type 3, and 191 phones with a type 4, yielding a relative rounded frequency of 2%, 43%, 26%, and 29%, respectively. One minus the relative frequency for type 2 produced a value of .5732, which was the novelty score for this phone in this category. This same process was repeated for all applicable 79 phone characteristic

categories, and these scores were averaged, yielding an overall novelty score of .3244 for the A930. As this example further illustrates, simply being a “newer” phone does not necessarily yield a higher novelty score, as the A930 was released in 2006, after the Migo, but had a lower overall novelty score (.3244 compared to .3651) based on its underlying characteristics.

 Insert Figure 2 about here

Reputation: Following prior research, data on a firm’s reputation was collected using the *Fortune* magazine’s “Most-Admired Companies” rankings from 1997-2008 (e.g. Basdeo, Smith, Grimm, Rindova, & Derfus, 2006; Fombrun & Shanley, 1990; Love & Kraatz, 2009; Pfarrer et al., 2010; Roberts & Dowling, 2002). The *Fortune* list has been developed since 1997 in conjunction with the Hay Group. The methodology begins with all firms in the *Fortune* 1,000—the 1,000 largest U.S. companies ranked by revenue. The companies are then sorted by industry, creating 65 groups of firms. Hay then polls over 16,000 senior executives, directors, and analysts and asks them to rate companies in their own industry on eight criteria: innovativeness, quality of products or services, ability to attract and retain talented people, quality of management, social responsibility to the community and the environment, wise use of corporate assets, financial soundness, and long-term investment value³. Finally, a reputation score is computed to determine that year’s most reputable firms and *Fortune* publishes the previous year’s rankings in March of the following year. These reputation scores were gathered and assigned to phones in the database whose primary carrier was able to be identified. This variable was interacted with

³ Ideally, only a reputation for innovativeness would be captured to highlight the impact of novelty and reputation on market discourse. Unfortunately, similar to other reputation studies, data was only reported in aggregate; however, as both innovativeness and quality of products or services are included as 2 of the 8 components of overall firm reputation, this measure is adequate to investigate the reputation of the firm introducing the new product.

the novelty variable above and used to test Hypothesis 2. To check for robustness, the reputation variable was also lagged by one year and produced largely similar results.

Price: Price information was collected from the same sources as the discourse, based on the Factiva keyword search, from reading the first few articles introducing the phone and recording the price in US dollars. The base price of the phone offered by the manufacturer was used, which does not account for any discounts based on entering into a long-term service agreement with the carrier, which may vary between carriers. This variable was interacted with the novelty variable and used to test Hypothesis 3.

Competitors' New Products: The number of new products introduced by the other major wireless service providers in the same calendar year as the focal product resulted in a count variable that captures the amount of contemporaneous new product introductions by rival firms, or “noise” that may have existed when a new phone was introduced by the focal firm. This variable was interacted with novelty and used to test Hypothesis 4.

Control variables.

We included four controls in all models to address concerns about the potential endogeneity of the novelty measure and other firm-level unobserved heterogeneity. *Multiple carrier dummy* takes a value of 1 if the phone has more than one carrier and is otherwise a 0. Although exclusive arrangements have become more of a trend in the wireless telephone industry, some phones are introduced by more than one carrier, which because more firms are introducing the phone may naturally lead to higher levels of discourse. *Subscribers* is a measure of firm size and is based on the number of subscribers in a given calendar year, as reported by the CTIA in the FCC's annual competition reports for the wireless telephone industry. *Early* is used to investigate the influence of time on novelty and discourse, as an “Early” dummy variable

was created that takes a value of 1 if the new product was introduced between 1998 and 2003 and has a value of 0 if introduced in 2004 or later. This time period was selected because of the events occurring in the U.S. wireless telephone industry: the last of the six major carriers studied came into existence in 2003 with the completion of the merger of Verizon Communications and Vodaphone to create Verizon Wireless and the completion of the acquisition of Nextel by Sprint. This major consolidation in 2003 suggested a natural breaking point in the data and the largest industry players remained relatively stable until 2008 when Verizon acquired Alltel to become the nation's largest wireless carrier, further consolidating the industry. Finally, *Manufacturer Dummy* was included to control for the potential influence of the 31 manufacturers included in the database.

Analytical procedures

The main database for the analysis is the new phones approved by the FCC for introduction into the United States market from 1998 to 2007, which were ordered chronologically by FCC approval date, thereby allowing the evolution of new product novelty across the time of the study to be evaluated. The unit of analysis is the new product introduction at the handset level, but each phone is introduced by at least one of six carriers. To help control for unobserved firm heterogeneity, the data were organized as an unbalanced panel with carrier firm-fixed effects. Because our data extended over ten years and we had multiple phone introductions for each carrier, our observations were not independent and so not appropriate for analysis with a simple ordinary least squares regression. Therefore, we used a carrier fixed-effects model. Estimating a fixed effect model is equivalent to adding a dummy variable for each carrier (Greene, 1993). It controls for unmeasured time-invariant differences across firms that may explain differences in the dependent variables. Fixed-effects models are considered

conservative because only changes in independent variables (e.g. product novelty) within a carrier can produce significant effects on the dependent variable (e.g. discourse duration or volume). Therefore, we can interpret a positive coefficient in these models as indicating a positive change in the independent variable within a carrier will cause a positive change in the dependent variable within that carrier. Moreover, phone manufacturer dummies were also included in the time series models to control for variances due to the specific manufacturers of the phones.

STATA software version 11 was used to run statistical analyses using a generalized least squared (GLS) model. As “duration” and “volume” were count variables, Poisson regression was used for these dependent variables⁴. All other variables were standardized before running the analyses to aid in interpretation of the coefficients. Skewness and kurtosis tests were run in STATA on the dependent variables and the results indicated the null hypothesis that the sample distribution is normally distributed cannot be rejected, meaning the sample appears to have a normal distribution. As such, models assuming normality were used for the analysis.

Descriptive statistics and correlations

Table 1 showcases the descriptive statistics and correlations for the main variables. Stars next to the numbers indicate significance at the .05 level.

 Insert Table 1 about here

RESULTS

Table 2 shows the results from the analysis described above in which the duration and volume of discourse were used as the dependent variable. Models 1 through 3 present the main effect results of the independent variables with the control variables. Models 4-6 show the

⁴ Note: R-squared is not interpretable when using Poisson regression so it is not reported.

interaction of novelty with reputation, models 7-9 represent the interaction of novelty with price, and models 10-12 present the results for the interaction of novelty with the number of competitors' new products. Finally, models 13-15 are the full models and present the findings including all independent, moderating, and control variables, which were used to determine the results from hypothesis testing.

Of note, several control variables were significant with duration and volume. The variable *early dummy* is positive and significant, indicating early in the life cycle of the industry, a higher duration and volume of discourse existed to help the market make sense of this emerging industry. Further, *multiple carrier dummy* was also positive and significant, as more carriers introducing the focal phone can lead to more mentions in media coverage. Finally, the number of *subscribers* was also significantly and positively related to both duration and volume of discourse, indicating the most popular firms also receive a higher amount of media attention.

Hypothesis 1 argued the more novel a new phone is the more intense the discourse would be to help market participants make sense of the uncertainty caused by this new product. Overall market discourse was measured using duration and volume, which are represented by Models 1 and 2 using only *novelty* as the independent variable, along with the controls and direct effects of the moderators. However, we used the full models represented by models 9 and 10 for purposes of interpretation. The results indicate support for this hypothesis, as novelty is positively and significantly related to duration, volume, and conflict ($b=.085$, $p<.01$; $b=.633$, $p<.01$; $.165$, $p<.05$, respectively).

Insert Table 2 about here

Hypothesis 2 argued for the moderating effect of reputation on the relationship between novelty and market discourse as a sensemaking mechanism. This hypothesis was partially supported, as the interaction of novelty and reputation had a negative and significant effect on the duration ($b=-.013$, $p<.01$) but a positive and significant effect on the volume ($b=.135$, $p<.01$) of discourse. Conflict is not significant.

Hypothesis 3 argued that price would interact with novelty to reduce the duration and volume of discourse as price would act as a signal of quality to reduce the uncertainty of the new product. Results mostly supported this hypothesis, as the interaction of novelty and price was negatively and significantly related to both discourse variables of duration ($b=-.019$, $p<.01$) and volume ($b=-.276$, $p<.01$). Conflict is again not significant.

Finally, Hypothesis 4 argued for an increased effect of novelty and discourse when competitors release new products in the same time period. Results fully supported this hypothesis, as the interaction of novelty and competitors' new products was positively and significantly related to duration ($b=.026$, $p<.01$), volume ($b=.069$, $p<.01$), and conflict ($b=-.65$, $p<.05$) of market discourse.

DISCUSSION

In this paper, we investigated the antecedents to market discourse, defined as the publicly available objective information and subjective opinion exchanged in the marketplace. We theorized how this discourse can be used by stakeholders as a sensemaking mechanism following the introduction of new products in the US wireless telephone industry between 1998 and 2007. We first hypothesized novel new products would experience greater duration, volume, and conflict of discourse relative to less novel products, arguing market participants need more discourse to reduce the increased uncertainty created by more novel products. Next, we

examined certain firm- and product-level characteristics as potential moderators for this positive novelty-discourse relationship. We theorized reputation would negatively moderate this relationship, as market participants would use a firm's existing reputation as another source of information regarding its current product offerings. Similarly, we hypothesized the new product's price would act as a perceived signal of quality for market participants, thereby reducing the uncertainty surrounding a new product, especially when that new product is more novel, which would reduce the duration and volume of discourse needed for sensemaking. Finally, we theorized other new products introduced by competitors will increase the "noise" in the market and, when the focal firm's new products are more novel, more duration and volume of discourse is needed to make sense of the novel new product, and more conflict would exist as a result.

Overall, the majority of our hypotheses are supported, with novelty being significantly and positively related to the duration, volume, and conflict of market discourse, meaning the more novel a new phone was, the more and the longer discourse occurred to help market participants make sense of the new product, and the more differences of opinion exist for market participants. As new products are introduced, they infuse new information into the market, which subsequently causes uncertainty for market participants. We theorized that in order to reduce this uncertainty, market participants seek information available from market discourse. The more novel a new product is, the more the potential uncertainty is and thus the more the need to engage in discourse to reduce this uncertainty. Although discourse has been looked at in prior research, its role as a dependent variable and in the overall evaluation of new products has not been studied before. As such, these findings that show a direct relationship between the novelty of new products and subsequent market discourse contribute to both the innovation and

discourse literature. Naturally, it will be important to determine how and when discourse determines the rejection and acceptance of new products by the market.

Further analysis highlighted how firm reputation impacts the market's sensemaking process following a new product introduction. Reputation was found to act as a moderator for the relationship between novelty and subsequent discourse, although this relationship was more complicated than originally expected. As hypothesized, reputation negatively moderated the relationship between novelty and the duration of discourse, as the market did not need as much time to make sense of a novel new product when information gained from the prior reputation of the firm could be used as a substitute for discourse. However, reputation was found to significantly and positively moderate the novelty-discourse relationship, which was the opposite of our expectation.

Specifically, prior research has shown that the media tend to focus more on firms with high performance and high reputation, thus biasing attention toward firms with a stronger reputation (e.g. Hayward, Rindova, & Pollock, 2004; Pollock & Rindova, 2003; Rindova, Pollock, & Hayward, 2006). Thus, it is not surprising that when a reputable firm introduced a highly innovative product, the product will attract substantial discussion initially. However, since the product is introduced by a reputable firm and the reputation of the firm can be used as a substitute for market discourse, it might be easier for market participants to reach an agreement on the usefulness of this product based on prior history of new product offerings. Thus, we observe this pattern of high volume but low duration of discourse.

The finding of a negative relationship between firm reputation and the duration of discourse is a significant departure from prior research on reputation, status, and organizational outcomes. One possible reason for this is the nature of the discourse examined as the dependent

variable. Discourse was intentionally captured that was specifically related to new product introductions in a dynamic and high-velocity industry. Therefore, the nature of the outcome studied here may explain some difference in results. Perhaps future studies could further unpack how the subject of discourse related to firm actions may have differential antecedents and influence on the market process. For example, does discourse about AT&T's mergers and acquisitions, participation in spectrum auctions, partnerships with suppliers, or other such actions differ from discourse related specifically to new product introductions? Firm-level variables – such as reputation – might have different relationships with discourse depending on the type of action or actions taken and thereby focused on differently in the market discourse that results from those actions. Future studies that include different types of actions and their subsequent impact on market discourse could help further unpack the results found here.

Similarly, price was further found to interact with novelty to act as a substitute for market discourse and decrease the duration and volume of discourse following a new product introduction. Although discrepancies exist in prior research regarding the actual relationship between price and quality, prior findings have concluded price can impact the perceived quality of products (e.g. Kirchler, 2003; Kirchler et al., 2010; Leavitt, 1954; Rao & Monroe, 1989). This conceptualization is consistent with the view taken in this paper that the quality and value of technology is a socially constructed process. Indeed, results here suggest that higher price led to higher perceived quality, which reduced the need for discourse as a sensemaking mechanism as operationalized by the duration and volume of discourse.

Finally, new products introduced by competitors around the same time as the focal firm were found to moderate the relationship between novelty and the duration, volume, and conflict of discourse. As predicted, when more new product offerings exist in the market, participants

need information contained in discourse to make sense of the new product, but this only occurred when the focal firm's product was relatively novel. Interestingly, the direct effect of competitors' new products was significant and negative on both duration and volume of discourse, but when interacted with novelty, this relationship became positive. It appears that when copious new products exist, any one new phone prompts less discourse because many other phones with which to make a comparison are already in the market. However, if a new phone is quite novel, then the comparisons do not work as well, and the market needs more duration and volume of discourse to make sense of it. This finding suggests that market participant attention is not fixed but rather can expand when facing very novel products.

Our research makes several contributions. First, we add to current research on discourse by focusing on the antecedents to discourse instead of how discourse impacts various organization actions and outcomes. We specifically focused on the novelty of new products and demonstrated how discourse is impacted by relative product novelty, theorizing the uncertainty surrounding new products causes market participants to seek information via market discourse, and found this is manifest by an increase in the duration and volume of discourse. In this way, we highlight the importance of market discourse as a key sensemaking mechanism for market participants.

We also contribute by making a theoretical distinction between the influence of media on the market process and discourse within the market process. The distinction between "media" discourse and "market" discourse is subtle but important. Prior work on discourse and media have identified two views on information distributors – termed "infomediaries" (Pollock & Rindova, 2003). From an economics view, the media act as experts whose monitoring facilitate exchanges between producers and consumers (Bilglaiser, 1993; Croson, 1996). On the other

hand, from an institutional theory perspective, the media can act to legitimate firms by, “influencing stakeholder perceptions of the desirability and appropriateness of firm actions and characteristics,” (Pollock & Rindova, 2003: 631) to include new products introduced by those firms. Although this prior work has focused particularly on how the media can influence market opinion, this study highlights how the viewpoints of several different market participants are presented through media-provided discourse. Therefore, it is not solely the voice of the media that is of interest, but the objective information and subjective opinion *reflected* in media-provided discourse that impacts the market process (Baum & Powell, 1995; Elsbach, 1994; Pollock & Rindova, 2003). If one were to simply look at the editorial section of the media, where employees of that newspaper are given a forum to discuss events based on their particular perspective, then the direct influence of “media” would be appropriate. However, by focusing on several different viewpoints, to include voices of and viewpoints from the producing firm, customers, rival firms, industry experts, suppliers, distributors, and other market participants captured in general market discourse, we develop a broader and conceptually richer explanation of the market process.

In sum, this paper uses the publicly available texts produced by the media as a representation of the underlying discourse occurring between and among various market participants. In this way, the media is simply a medium of information exchange that captures and distributes market discourse. By exploring the antecedents and various characteristics of this market discourse, this study explored the impact of new product novelty.

Finally, we also contribute to discourse studies by exploring several firm- and product-level mediators that impact the positive relationship between novelty and discourse. Results suggest reputation and price can act as substitutes for discourse and the market was able to use

other key informational cues as a sensemaking mechanism to help reduce uncertainty of a new product. In addition, whereas the market can use other new products introduced by competitors as points of comparison to help reduce the need for discourse, when products are more novel, more duration and volume of discourse is needed for market participants to make sense of those novel new products, and more conflict results from the uncertainty.

Although preliminary, the results suggest that discourse is a complex, multi-dimensional construct that is impacted by various characteristics at the product, firm, and industry levels. In particular, although discourse maybe an important sensemaking mechanism for market participants to help reduce uncertainty, contextual factors such as firm reputation and the price of the product can affect the level of discourse that exists. These findings are different than what has been found by earlier media attention studies (e.g. Pollock & Rindova, 2003; Rindova et al., 2005) and highlights the importance of discourse as a sensemaking mechanism as opposed to a medium that simply follows (or contributes to) the sensationalization of new and novel products and firms. A better understanding how market participants deal with new information and new products introduced by firms is of both theoretical and practical importance. Academics have long since been interested in how markets “move” and this paper attempts to advance the theory based on specific new product introductions and their impact on the market process. Further, by better understanding how market participants use discourse to accept or reject their competitive actions, firms may be in a better position to influence the market process towards acceptance of their products. A more fine-grained study of actions and the market process – paying particular attention to the importance of market discourse and the sensemaking activities of market participants – will lead to a more complete understanding of how new product introductions, especially more novel products, drive the market process.

LIMITATIONS AND FUTURE DIRECTIONS

Although we believe the research was conducted with a high degree of rigor, limitations still exist. In particular, our study focuses on only one industry, namely the wireless cellular telephone industry in the United States. Although necessary to calculate relative novelty across new product introductions, focusing on only one industry invites the question of this study's findings being generalizable to other industries and contexts. Of particular interest could be those products that cross traditional industry borders, as is often the case with high-technology products. In addition, we investigated only one type of firm action – new product introductions – whereas prior work on competitive dynamics has incorporated numerous types of actions, to include price cuts, market entry, mergers and acquisitions, and so forth (see Grimm, Lee, & Smith, 2006 for a review). Future research could examine the discourse created by actions beyond new product introductions.

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FIGURES AND TABLES

Figure 1: Model of Research Hypotheses

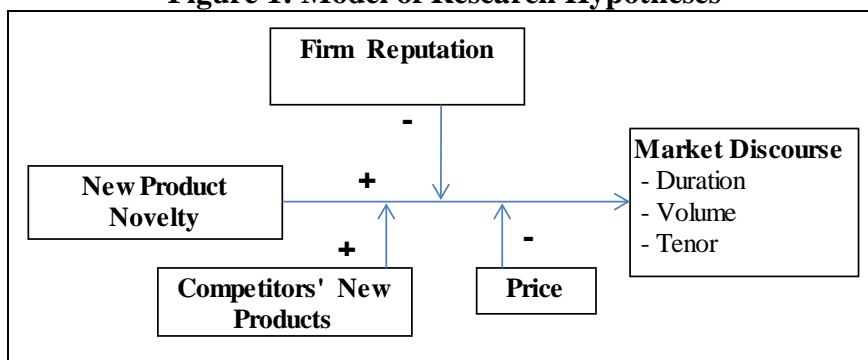


Figure 2: Example of “New to Market” novelty measure calculation

Phone Name	Running Weight			Antenna Type	Type 1 Existing	Type 2 Existing	Type 3 Existing	Type 4 Existing	Relative Frequency	Antenna Type Novelty
	Weight	Average	Novelty							
LG Migo VX-1000	2.46	4.07	0.40	4	13	222	160	170	0.30	0.70
Samsung SCH A-930	3.98	4.04	0.01	2	13	280	172	191	0.43	0.57

Table 1: Descriptive Statistics and Correlations

Variable	Obs	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10		
1 Duration	390	582.28	208.32	0	730	1											
2 Volume	390	64.79	106.36	1	889	0.3146*	1										
3 Conflict	390	1.82	217752.3	0	858	0.09	0.1868*	1									
4 Novelty	390	0.31	612523.0	0	4461.00	0.04	0.2558*	0.2499*	1								
5 Reputation	390	6.11	0.98	4.11	7.83	0.03	-0.02	0.04	0.2317*	1							
6 Price	390	209.94	144.54	10	749	0.2743*	0.2726*	0.05	0.10	-0.0933	1	0					
7 Early	390	0.36	0.48	0	1	0.1568*	0.00	-0.1523*	-0.6194*	0.00	.1848*	1	0				
8 Multiple Carrier Dummy	390	0.44	0.50	0	1	0.1300*	0.1819*	0.1014*	-0.07	-0.0053	0	.0141	0	0.0645	1		
9 Subscribers (thousands)	390	41493	17650	4103	71317	-0.01	0.1410*	0.1534*	0.3425*	0.4069*	-0	.0327	-0	.3819*	-0.0087	1	
10 Competitors' New Products	390	138	36	6	181	-0.08	0.05	0.1479*	0.7001*	0.1662*	-0	.0124	-0	.4138*	0.03	0.2438*	1

* significant at p < .05

Table 2: Hypothesis Testing

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15
	DV: Duration	DV: Volume	DV: Conflict	DV: Duration	DV: Volume	DV: Conflict	DV: Duration	DV: Volume	DV: Conflict	DV: Duration	DV: Volume	DV: Conflict	DV: Duration	DV: Volume	DV: Conflict
Novelty	0.081** (0.003)	0.607** (0.009)	0.104+ (0.060)	0.077** (0.003)	0.635** (0.009)	0.117+ (0.062)	0.074** (0.003)	0.559** (0.009)	0.123+ (0.065)	0.096** (0.003)	0.633** (0.010)	0.135* (0.062)	0.085** (0.004)	0.633** (0.010)	0.165* (0.067)
Reputation	0 (0.003)	-0.118** (0.008)	-0.037 (0.053)	-0.007* (0.003)	-0.104** (0.008)	-0.012 (0.058)	-0.001 (0.003)	-0.121** (0.008)	-0.034 (0.053)	0.004 (0.003)	-0.112** (0.008)	-0.024 (0.053)	-0.003 (0.003)	-0.099** (0.008)	0.007 (0.058)
Price	0.102** (0.003)	0.343** (0.008)	0.051 (0.059)	0.104** (0.003)	0.330** (0.008)	0.045 (0.060)	0.088** (0.004)	0.211** (0.010)	0.082 (0.071)	0.100** (0.003)	0.343** (0.008)	0.044 (0.059)	0.086** (0.004)	0.185** (0.010)	0.063 (0.071)
Competitors' New Products	-0.056** (0.003)	-0.210** (0.009)	0.025 (0.052)	-0.059** (0.003)	-0.172** (0.010)	0.036 (0.053)	-0.056** (0.003)	-0.195** (0.009)	0.026 (0.052)	0.005 (0.005)	-0.128** (0.014)	0.176+ (0.091)	0.002 (0.005)	-0.031* (0.014)	0.195* (0.093)
Early Dummy	0.080** (0.004)	0.253** (0.011)	0.036 (0.067)	0.084** (0.004)	0.242** (0.011)	0.025 (0.068)	0.079** (0.004)	0.214** (0.011)	0.039 (0.067)	0.092** (0.004)	0.270** (0.011)	0.061 (0.068)	0.093** (0.004)	0.229** (0.011)	0.051 (0.069)
Mult Carrier Dummy	0.044** (0.002)	0.308** (0.007)	0.118** (0.039)	0.044** (0.002)	0.309** (0.007)	0.120** (0.040)	0.045** (0.002)	0.317** (0.007)	0.116** (0.040)	0.045** (0.002)	0.311** (0.007)	0.120** (0.039)	0.046** (0.002)	0.325** (0.007)	0.121** (0.040)
Subscribers	0.003 (0.007)	0.200** (0.021)	0.219+ (0.123)	0.012+ (0.007)	0.152** (0.022)	0.188 (0.126)	0 (0.007)	0.164** (0.021)	0.225+ (0.123)	0.018** (0.007)	0.218** (0.021)	0.251* (0.123)	0.023** (0.007)	0.141** (0.021)	0.223+ (0.126)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Novelty x Reputation				-0.017** (0.003)	0.103** (0.008)	0.053 (0.049)							-0.013** (0.003)	0.135** (0.009)	0.059 (0.049)
Novelty x Price							-0.017** (0.003)	-0.257** (0.008)	0.041 (0.051)				-0.019** (0.003)	-0.276** (0.008)	0.034 (0.05)
Novelty x Comp New Products										0.026** (0.002)	0.045** (0.006)	0.063* (0.031)	0.026** (0.002)	0.069** (0.006)	0.065* (0.031)
Constant			0.212** (0.062)			0.204** (0.062)			0.223** (0.063)			0.191** (0.062)			0.191** (0.065)
Observations	390	390	390	390	390	390	390	390	390	390	390	390	390	390	390
Number of Carrier Category	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
R-squared			0.10			0.10			0.10			0.11			0.11

Standard errors in parentheses

+ significant at 10%; * significant at 5%; ** significant at 1%

Appendix: Table of Cellular Telephone Characteristics Included in Novelty Measure

Item #	Phone Characteristic	Variable Type
Specifications		
	Mode	
1	Weight	Continuous
Dimensions		
2	Length	Continuous
3	Width	Continuous
4	Height	Continuous
5	Form factor	Categorical
6	Antenna type	Categorical
Battery (hours)		
7	Talk	Continuous
8	Standby	Continuous
Display		
9	Type	Categorical
10	Resolution (pixels)	Categorical
11	Size (inches)	Continuous
12	Colors	Categorical
13	Backlight	Dummy
14	Phone book capacity	Continuous
Features		
15	Flashlight	Dummy
16	GPS/Location	Dummy
Accessibility		
17	Digital TTY/TDD	Dummy
18	Multiple languages	Categorical
Alerts		
External Display		
19	Type	Categorical
20	Resolution	Categorical
21	Polyphonic Ringtone	Categorical
22	Ringer Profiles	Dummy
23	Vibrate	Dummy
Connectivity		
24	Bluetooth	Dummy
25	Infrared	Dummy
26	PC Sync	Dummy
27	SDIO	Dummy
28	Wi-Fi	Dummy
29	USB	Dummy
Contacts		
30	Multiple numbers per name	Dummy
31	Picture ID	Dummy
32	Ringer ID	Dummy
33	Voice dialing	Dummy
Customization		
34	Changeable Faceplates	Dummy
35	Custom Graphics	Dummy
36	Custom Ringtone	Dummy
37	Real-Music Ringers	Dummy

Item #	Phone Characteristic	Variable Type
Data & Network		
38	Data Capable	Dummy
39	External Antenna Jack	Dummy
40	Flight Mode	Dummy
41	Data Tech	Categorical
42	Packet Data	Categorical
43	WAP/Web Browser	Dummy
Input		
44	Predictive Text Entry	Dummy
45	Side Keys	Dummy
46	Key Layout	Categorical
47	Text Keyboard	Categorical
48	Touch Screen	Dummy
49	Memory card type	Dummy
Messaging		
50	EMS/Picture Messaging	Dummy
51	Email Client	Dummy
52	MMS	Dummy
53	Text Messaging	Dummy
54	Text Messaging Template	Dummy
Music		
55	FM Radio	Dummy
56	Headphone Jack	Dummy
57	Music Player	Dummy
Photo & Video		
58	Camera Resolution	Categorical
59	Picture Bridge	Dummy
60	Video Capture	Dummy
61	TV Output	Dummy
62	Video Resolution	Dummy
63	Video Sharing	Dummy
Productivity		
64	Alarm	Dummy
65	Calculator	Dummy
66	Calendar	Dummy
67	ECML/Digital Wallet	Dummy
68	Integrated PDA	Dummy
69	SyncML	Dummy
70	To-do List	Dummy
71	Voice Memo	Dummy
Software		
72	BREW	Dummy
73	Games Embedded	Dummy
74	Games Downloadable	Dummy
75	Java Version	Dummy
Voice		
76	Call Screening	Dummy
77	Headset Jack	Dummy
78	Push-to-talk	Categorical
79	Speaker Phone	Dummy