

ABSTRACT

Title of dissertation:

CAN YOU HEAR ME NOW? EXAMINING
MARKET DISCOURSE AS A SENSEMAKING
MECHANISM OF ENTREPRENEURIAL
ACTIONS IN THE U.S. WIRELESS
TELEPHONE INDUSTRY, 1998-2007

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Entrepreneurial actions, such as new product introductions, infuse new information and drive the market process by moving the market either toward or away from existing market conditions. These products cause uncertainty for market participants, who engage in discourse as a sensemaking mechanism to reduce this uncertainty and eventually either accept or reject the new product, which is essentially the market process. Central to this process, however, is the oft-overlooked phenomenon of market discourse, or the objective and subjective information exchanged in the marketplace, that can be a key sensemaking mechanism when confronted by uncertainty surrounding new products by firms. However, little is known regarding the impact of entrepreneurial actions and the process of *how* market discourse moves the market. Using a unique dataset created from the United States wireless telephone industry from 1998-2007, I explore how novelty impacts various aspects of market discourse among market participants and how this discourse impacts subsequent sales of individual cell phones. Results suggest that discourse can act as a sensemaking mechanism when new products are relatively more novel than prior phones, but that reputation and competitive intensity can act as a substitute for discourse as a sensemaking mechanism to reduce uncertainty experienced by the market. In addition, discourse was found to positively influence sales but that this effect diminishes over time. Finally, findings indicate discourse acts to fully mediate the relationship between phone novelty and sales, which highlights the importance of studying discourse when examining firm actions.

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by

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DEDICATION

To my mom and dad, who didn't necessarily want me to come back to school but – like so many of my other pursuits in life – loved and supported me anyway. I couldn't have done this without you and I hope I've made you proud of what I've done and who I've become.

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Chapter 1: Introduction

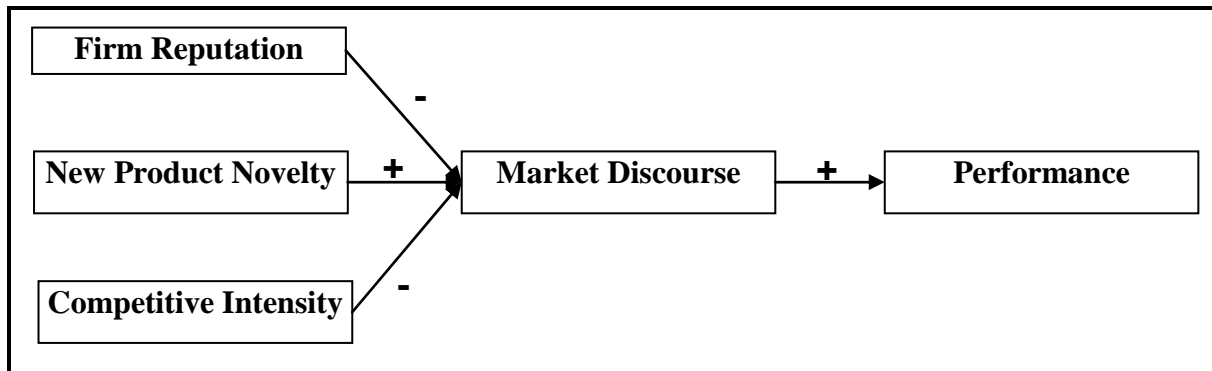
Recently scholarly attention has increased regarding market discourse, or the publicly available objective information and subjective opinion market participants use to make decisions. In particular, researchers have focused on what discourse does, including influencing market entry decisions (Lee & Paruchuri, 2008) and competitive interactions (Kennedy, 2005; 2008), diffusing innovations (Rogers, 1995) and management practices (Abrahamson & Fairchild, 1999), and assisting in categorization (Rosa, Porac, Runser-Spanjol, & Saxon, 1999).

However, what have been largely overlooked are the factors that influence the types, levels, and characteristics of market discourse and how this discourse directly impacts performance. Little is known about the antecedents of market discourse and how certain firm actions can influence several characteristics of discourse, such as how long, how often, and how positively these actions are discussed. In addition, Rogers (1995) and Weick (1995) have argued for discourse as a key sensemaking mechanism to help the market reduce uncertainty surrounding novel innovations or “surprises” in the marketplace.

Therefore, the purpose of this dissertation is to examine novelty, firm reputation, and the competitive intensity of the environment as antecedents to market discourse and explore dimensions of discourse, with an eye to performance implications (See Figure 1 below). In particular, I focus on four key measures of discourse: *duration* (how long the discourse lasts), *volume* (cumulative number of articles that mentions a specific entrepreneurial action), *frequency* (how concentrated the discourse is over time), and *tenor* (positive or negative tone of discourse). Obtaining a better understanding of how the market reacts to novel innovations via discourse has implications for both researchers and practitioners alike. I study discourse in the context of new product introductions in the US wireless telephone industry between 1998 and 2007. Results

suggest that whereas novel products can increase uncertainty and therefore require more discourse to help make sense of the new product, reputation and competitive intensity can act as a substitute for discourse as a sensemaking mechanism to help reduce uncertainty for market participants following a new product introduction.

Figure 1: Dissertation Research Model



Whether manifested by new products or processes, new market entry, new venture creation, or the combination of existing resources, customers, and/or markets, entrepreneurship entails *action* (Gartner, 1985; Grimm, Lee, & Smith, 2006; Lumpkin & Dess, 1996; McMullen & Shepherd, 2006; Schumpeter, 1934; Smith & DiGregorio, 2002). I use the term “entrepreneurial action” to describe new actions by firms that are either unique to the industry and/or new to the firm introducing the action (Kirzner, 1973; Smith & Cao, 2007; Smith & DiGregorio, 2002), which is beyond the narrow definition of entrepreneurship of simply “new venture creation” (Shane & Venkataraman, 2000). Although similar in meaning with “innovation,” I incorporate the term “action” to be consistent with relevant research done in this area, particularly streams of research that have focused on sensemaking (Weick, 1995) and competitive dynamics (see Smith, Grimm, Gannon, & Chen, 1991), to take an action-oriented approach to explore the entrepreneurial activity of firms. Specifically, I focus on one key type of entrepreneurial action, namely new product introductions (handsets) in the wireless

telecommunication industry, although in general the theory and empirics explored here could be applied to other types of entrepreneurial actions by firms.

Entrepreneurship has been described as the driving force behind economic development, dynamics of the business environment, and the evolution of industrial markets (Kirzner, 1973; Schumpeter, 1934; Shane & Venkataraman, 2000). Entrepreneurial actions emerge from a nexus of entrepreneur and opportunity (Shane, 2003) to introduce new information into the market (Smith & Cao, 2007). Entrepreneurial managers looking to gain a competitive advantage for their firm can identify opportunities to disrupt, alter, or stimulate the market by proactively acting in the market environment. However, a great deal of uncertainty exists for the entrepreneurial firm, as the reaction by the market towards the new product is unknown at the time of introduction. Indeed, entrepreneurial 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).

Entrepreneurial actions in this dissertation are operationalized as new product introductions in the U.S. wireless telephone industry. In particular, I measure how novel or different each phone is relative to prior phones available in the market. Novelty, or innovativeness, has been studied in prior research, but the definitions, measurements, and impact of novelty have been inconsistent (e.g. Garcia & Calantone, 2002; Gatignon, Tushman, Smith, & Anderson, 2002; Green, Gavin, & Aiman-Smith, 1995). Regardless of what term one uses, either “entrepreneurship,” “innovation,” or “novelty,” the area of interest is firms doing something new or different than what has been done previously. Using archival data, I capture the relative difference of a new phone to all previously released products across all phone

characteristics, including cosmetic, technological, and functional categories. I make no judgment a priori regarding what innovations will be more impactful but treat them all the same – which is a similar perspective to the firm releasing the new product – to examine the market process following each new product introduction.

Although new products by firms have varying degrees of “newness” or “destructive” capacity (Schumpeter, 1942) and therefore impact the market in different ways, each new product is still 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 products or services available (Hayek, 1949; Kirzner, 1973). As a result, market participants must react to this new information, and these reactions take one of the following forms: 1) acceptance, 2) rejection, or 3) a state of uncertainty or unpredictability somewhere in between. Market participants can be classified into three categories: customers, complementors (i.e. resource providers such as suppliers, distributors, investors) and competitors. Each group acts as an external stakeholder that is affected by the consequences of the new product introduction in different ways. In turn, the impact of that new product on the market process is dependent on the participants’ reaction to the product. The strategic implications based on the market’s reaction at the extremes are clear (i.e. continue with what is accepted, abandon or update what is rejected), but how the market deals with the new uncertainty in between and the subsequent implications for firms are less clear.

Uncertainty is defined as, “the degree to which a number of alternatives are perceived with respect to the occurrence of an event and the relative probabilities of these alternatives” (Rogers, 1995: 6), which implies unpredictability and motivates an individual to seek information. Since not all interpretations of the consequences or meanings of the new product

are consistent among all market participants, the new information creates uncertainty for market participants as they attempt to make sense of the new product, new combination of resources, etc. encapsulated by entrepreneurial actions (Brehmer, 1976; Festinger, 1954; Rogers, 1995; Weick, 1995). This uncertainty stems from several factors as market participants are not sure what to expect from the new product. Sheth (1981) identified three major types of perceived risk: aversive physical, social, or economic consequences, performance uncertainty, and perceived side effects associated with the innovation. Ram and Sheth (1989) identified both functional (product usage, product value, and risk) and psychological barriers (existing norms and perceptions associated with a new product) to acceptance of an innovation. Hoeffler (2003) identified 6 areas of uncertainty, namely uncertainty about estimating benefits, drawbacks, and social implications and uncertainty about the manufacturer's ability to deliver benefits, overcome drawbacks, and influence social implications.

Adding to this uncertainty is the nature of the value of technology itself. When firms release new products to the market – particularly technology-based innovations – the complete value of the product is rarely known a priori. Prior work on the social construction of technology highlights how value is a matter of perception based on the interpretations and collective activities of the market (e.g. Callon, 1987; Davis & Taylor, 1976; Hughes, 1987; Klein & Kleinman, 2002; Pinch & Bijker, 1984). The underlying quality of the new product is not always the most important aspect considered when making a purchase decision. Anecdotally, the Betamax versus VHS standard war in the 1980s demonstrated how the technologically superior Betamax was outdone by the social acceptance of VHS. Research on information cascades showed how subjects repeatedly ignored their own preferences for choices of agents ahead of them (e.g. Bickchandani, Hirshleifer, & Welch, 1992, 1998), regardless of feelings of

underlying quality. In addition, social proof research stimulated “correct” behavior by seeing what others are doing (e.g. Milgram, Bickman, & Berkowitz, 1969). More importantly, the effects of information cascades and social proof were found to work better under conditions of uncertainty, as the subjects focused more on information gained from watching others than the underlying qualities and characteristics of the object. As such, the new product introduces uncertainty for the focal firm introducing the new product as the acceptance or rejection by the market is not completely known a priori. However, firms that are able to understand the fundamental sources of that uncertainty can make strategic decisions based on the market’s reaction to improve its product offerings to increase the likelihood of acceptance by the market.

One mechanism used by market participants to make sense of the environment and to reduce this uncertainty is discourse or debate (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 accept and some may choose to reject, the divergence of opinions may not be resolved, but the uncertainty of not knowing whether to accept or reject for individual participants will be attenuated. The collective action of acceptance or rejection by the market can then lead to the abandonment or updating of current – or the creation of entirely new – market beliefs.

In this dissertation, the market process is viewed as a sensemaking activity for various market participants with market discourse as a critical element. In his seminal work on the subject, Weick (1995) explained sensemaking in the following way: it begins with an unexpected event or surprise, it is retrospective, sensemakers offer plausible explanations and implications of

the surprise, and those speculations are presented in a tangible medium. Matching Weick's description, in this dissertation the "surprise" is the entrepreneurial action or new product introduction of a firm, the retrospection and speculation is the evaluative process of dealing with the uncertainty introduced by 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). Thomas, Clark, and Gioia (1993) described sensemaking as "the reciprocal interaction of information seeking, meaning ascription, and action" (pg. 240). As will be explained, information exchange among market participants is central to the market process and is the focus of this dissertation.

Market discourse has been treated by extant research as verbal and written communication between producers, consumers, and rivals. For example, Rosa and colleagues (1999) counted the number of references by consumers to product categories in the minivan market. Similarly, Kennedy (2005) counted the number of references to industry rivals in both the media and company press releases for the computer workstation industry. Fiss and Hirsch (2005) examined the use of discourse as a "collective public vocabulary" in the sensemaking activities of the market regarding the trend of globalization. In addition, Phillips and colleagues (Phillips, Lawrence, & Hardy, 2004) pointed to market discourse as an integral mechanism in the establishment of institutions. Other researchers have narrowed their examination to view discourse as the rhetoric provided by the firm itself to diffuse innovation and to persuade the market to accept its practices or products (e.g. Abrahamson & Fairchild, 1999; Green, 2004). This narrow view of discourse from the focal firm, combined with the volume of the discourse of consumers and rivals, overlooks the behavioral and cognitive impact of uncertainty and the use

of discourse by market participants following entrepreneurial actions, which represents a theoretical and empirical gap.

Therefore, building on Phillips and colleagues' (Phillips et al., 2004) theoretical work regarding discourse and institutions and Fiss and Hirsh's (2005) empirical examination of market discourse as a sensemaking activity, the intent of this dissertation is to examine market discourse as a vehicle to theoretically and empirically explore the impact of entrepreneurial action on sensemaking and the market process. I argue that discourse is integral to the sensemaking activities of market participants and the movement of the market towards acceptance or rejection of a new product introduction. Specifically, I ask the following research questions: How do new products affect market opinion and the market process? How does the market's opinion of a new product get formed and what factors lead to the eventual convergence of market opinion and new market beliefs?

Recognizing that various types of market participants exist, I take a stakeholder view of the market process, where different groups are influenced by and influence the market process in different ways. These groups can include customers, potential supply chain partners (to include suppliers of parts for the goods sold and distributors or retailers that may sell the goods), resource providers such as investors and other stockholders, and other rival firms in the industry (DiMaggio & Powell, 1983; Elsbach, 2003; Freeman, 1984). Each of these groups is potentially an important stakeholder that is impacted by entrepreneurial actions depending on the vested interest each has in the consequences of the new products. In turn, the stakeholders themselves often participate in market discourse and can therefore influence the sensemaking process of the market.

Example of Phenomenon

For an example of the phenomenon of interest, I turn to the wireless telephone industry. For years, the wireless phone was used only for making phone calls when away from a land-line or car phone. However, in 2002, Sprint introduced a camera phone to the U.S. market (Sanyo SCP-5300), which combined the capabilities of a digital camera with a wireless phone and is an example of an entrepreneurial action. This new combination represented a departure from the current norm, which initially created uncertainty in the market and led to a great deal of market discourse about this new concept, which helped market participants better understand the new product and reduced this uncertainty. Below are some examples of what this early discourse contained.

From Time magazine, December, 2002:

Do you want to be able to take pictures with your phone and email them to anyone from anywhere? Cell phones with cameras are *all the rage* in Japan, and they're starting to invade our shores. The *quality* isn't exactly Ansel Adams, but the quick- pic payoff--Look, Ma, here I am in the Big Apple!--can be addictive. Imagine all the *day-to-day situations* in which it would be nice to show someone what you're seeing at the moment you see it: house hunting, grocery shopping, bar hopping. The research firm IDC says that by 2004 there will be more cell-phone cameras sold worldwide than digital cameras (Taylor, 2002, emphasis added).

This predominantly positive discourse highlighted the various situations in which a camera phone could be used. In the same article, however, was written, "Only a handful of these devices are on sale right now. As usual for first-generation gadgets, the balance between cool features and easy operation has *not quite been struck*" (Taylor, 2002, emphasis added). This somewhat negative tone pointed out the uncertainty surrounding the likelihood of being able to successfully integrate a camera into a cellular phone and whether or not the camera phone would be accepted and/or popularized by market participants.

Another article in the same month from the St. Paul Pioneer Press contained the perspective from a customer, writing, "'It's multi-use,' Brama says of his Sanyo. 'It's my camera.

It's my phone. It can be my memory. *It's my life*'" (Suzukamo, 2002, emphasis added). Here the value and use of the camera phone is beyond merely the objective or factual features of the phone and has moved into the subjective or experiential phase of evaluation. Also, in the same article was written, "Americans don't seem to be widely embracing camera phones so far, though. Such handsets remain relatively expensive and *complicated*" (Suzukamo, 2002, emphasis added). Again, combined with the previously positive customer interaction is some negative discourse that highlights the uncertainty surrounding the acceptance or rejection of this technology.

Finally, another article written in the *Boston Globe* early the following year (Howe, 2003) highlights how the competitive landscape of the wireless telephone industry has changed because of this early action by Sprint:

Raging *competition* in the wireless telecommunications industry is spurring services way beyond free nights and weekends and sexy new handsets. Consumers are seeing pictures on phones, more walkie-talkie services, and a growing push to get landline customers to go all-wireless (Howe, 2003, emphasis added).

Positive discourse that pointed to the fact that combining a digital camera with a wireless phone allows the user to immediately send the pictures taken with the phone to others – a capability not available to stand-alone digital cameras – helped increase its acceptance. Alternatively, others expressed displeasure about the relative camera phone quality versus stand-alone digital cameras. However, over time, the success of the camera phone is evident as it has become practically the de facto standard in cell phones with approximately 85% of all wireless phones sold in 2008 containing a camera function (reportlinker.com). In addition, wireless companies are competing on the basis of camera phone features beyond the mere ability to make phone calls (e.g. number of mega pixels, video capture, cost of image transfer, etc.).

A particularly interesting point from the last article is the author's discussion of other types of innovations that have also been added to cellular phones. In particular, walkie-talkie services were touted for their relatively cheaper costs and ability to transmit where cellular phones could not (due to their use of radio waves as opposed to cellular frequencies). This technology was at the core of the service provider Nextel's portfolio and was central to Sprint's acquisition decision of Nextel in 2005. However, in November 2009, Sprint-Nextel announced it was reducing the number of phones in its arsenal that utilize the "push-to-talk" technology of walkie-talkie phones (Twiddy, 2009). Both the camera phone and walkie-talkie technologies increased the convenience of using a cell phone and the success of both was unknown at the time of introduction, so why did camera phones become the de facto standard in cell phones and why are walkie-talkie phones declining in popularity? I argue the social process in response to new products encompassing these respective technologies played out in market discourse is at the heart of understanding why some innovations succeed while others fail, which is the essence of what I am exploring in the dissertation.

Contributions

This dissertation intends to make several contributions. First, I take a fine-grained, action-based approach to studying entrepreneurship and its function as a catalyst to stimulate and move the market process. Next, I look at antecedents to market discourse and particularly examine how certain product-, firm-, and industry-level characteristics can influence the level and type of discourse that occurs in the market. I also explore discourse both theoretically and empirically as a multi-dimensional construct of sensemaking in the market process. Finally, I examine the temporal nature of discourse and tie it directly to performance outcomes.

Overview of chapters

The remainder of the dissertation is outlined as follows. Chapter 2 presents a review of the relevant literatures, focusing on the market process and market discourse. In addition, I discuss a stakeholder view of the various market participants affected by the entrepreneurial action and how they in turn can affect the market process. Chapter 3 presents the hypotheses studied in the course of the dissertation, separated into stage 1 (discourse as a dependent variable) and stage 2 (performance as a dependent variable). Chapter 4 details the research methods, including the data collection procedures, measures, and variables. Chapter 5 presents the results and Chapter 6 contains a discussion of the results, the limitations, and future directions, which are not designed to be all inclusive but rather paint a picture of the types of paths I will attempt to follow in the future.

Chapter 2: Theoretical background and Literature review

The Market Process

At its most basic level (and admittedly highly simplified), the market process predominantly deals with two types of market actors – the producer (or producing firm, hereafter “firm”), that provides goods and services, and the customer, who potentially purchases those goods and services. The primary standard for the customer is value, which is the perception in the mind of the customer about how much the good is worth (Schumpeter, 1934). The two basic elements of value are price and satisfaction of a need – all else being equal, if the good satisfies the need at a price that is worth that satisfaction, a transaction will occur. Failure of either of those elements will result in the lack of a transaction. Therefore, it becomes necessary for the firm to provide a good in a manner that the customer perceives as valuable. The primary standard for the firm is a balance of cost and benefit – if the good costs more to produce than it can be sold for, the firm will not produce it (Schumpeter, 1934). In this manner, the firm and customer can enter into an exchange that is mutually beneficial, with the firm providing a valuable good or service and the customer helping the firm to cover its costs. However, a constant tension exists between the parties. The firm wants to sell the good at the highest price possible to maximize profits, whereas the customer wants to buy the good at the lowest possible price to minimize costs. The place where price and value meet and the transaction occurs is what economists call equilibrium, or the convergence of supply and demand. (Here, “supply” refers to the quality and perceived value of the supply rather than the quantity of the supply as commonly discussed in micro-economics.) This repeated interaction between the firm and the customer and the cycle of convergence of their various product offerings and expectations respectively is essentially the market process (Kirzner, 1973).

The market process is inherently iterative and evolutionary and unfolds over a period of time, as firms and various market participants interact in a feedback loop of information, expectations, and values (Smith & Cao, 2007). When a successful transaction between a producer and customer occurs, information is signaled to market participants. It tells the firm that its mix of characteristics and price is acceptable to the market, and it gives the customer an expectation regarding the characteristics of the good and the possible price those characteristics will cost. A signal is also sent to other participants in the market, who now have an observable mix of price and quality that equals demand and a clearer understanding of what the market believes is acceptable (Hayek, 1949; Kirzner, 1973). When the level of overall market demand is met, competition has the potential to change the characteristics of the good, either by forcing the firms to improve the quality or to reduce the price (Kirzner, 1973). Failure to do so may open up the opportunity to have the customers' needs met by others.

The transaction described above assumes the information possessed by the seller (the characteristics and quality of the good) and the information possessed by the buyer (the desired characteristics and willing price to pay) is known to each other, which economists call "perfect information" (Scherer & Ross, 1990). It also assumes that other firms and other customers do not have different levels of characteristics and expectations that those of the focal actors, otherwise transactions could just as easily occur between them as well. If we relax those assumptions, uncertainty exists between firms and customers in the market, with neither knowing with perfect certainty the intersection of supply and demand necessary to complete a transaction.

Of central importance to this discussion is the idea that new products can introduce uncertainty into the market (Hoeffler, 2003; Rogers, 1995; Smith & Cao, 2007). Uncertainty implies unpredictability or a lack of understanding surrounding several important aspects of the

innovation, including its intended or unintended consequences (Rogers, 1995). In his extensive examination of uncertainty caused by “really new products (RNPs),” Hoeffler (2003) used 6 categories to classify uncertainty (uncertainty about estimating benefits, drawbacks, and social implications and uncertainty about the manufacturer's ability to deliver benefits, overcome drawbacks, and influence social implications). In addition, Hoeffler, Moreau, & Kubowicz (under review) used 8 types of uncertainty (usage, performance, network externality, switching cost, learning curve, price change, symbolic, and affective reaction). The basic idea is that market participants may not understand how the innovation works, why it works, if it will work the way the producer says it will, what they will have to do to properly use it, and what it will cost them to properly use it. Whatever classification the uncertainty belongs, this uncertainty is reduced over time only after receiving and processing relevant information related to the new product, which is a sensemaking process involving market discourse.

Therefore, it follows that an essential element to this market process is information, which has been described as a “vital good” in the marketplace (Phillips, 2003: 26). The firm must know what characteristics of the good will satisfy the customer and the price that will allow the transaction to be completed (Price, Dennis, Gioia, & Corley, 2008; Rindova & Fombrun, 1999). On the other hand, the customer must know the good exists that can potentially satisfy his or her needs (Fombrun & Shanley, 1990; Toften & Rustad, 2005). However, there is often a gap between what the firm and customer knows (Corts, 1997; Fombrun & Shanley, 1990; Stiglitz, 2002; Zeithaml, Parasuraman, & Berry, 1990). In addition, customers may not have the means to access information in order to evaluate the new good or other firm actions effectively (Boyce & Lepper, 2002; Davies, 2002; Palepu & Elcock, 2001). When a misperception or ignorance of either the perceived value of the good or the existence of the good exists, or if the firm fails to

provide the good at the price and quality the customer is willing to pay, the market is said to be in a state of disequilibrium where a transaction does not occur. In this situation, either the firm must improve the quality of the good or offer it at a lower price, or the customer must lower his or her standards for quality or be willing to pay a higher price for that same good to complete the transaction and move the market back to equilibrium. Otherwise, the customer could go to another firm or the firm could search for another customer to complete a transaction. In either case, the exchange of information regarding other alternatives is necessary to educate the producer and consumer of other possibilities to engage in a satisfactory transaction.

This exchange of information between various market participants is what I call market discourse, which acts both to disseminate objective information (i.e. facts about the price of the good and previous expectations of the customer) and subjective opinion (i.e. perceived value of the good or unmet expectations of the customer) to the market. Either the objective or the subjective nature of discourse may be necessary to resolve the uncertainty between the firm and the customer, or both may be required to move the market towards a successful transaction. As Weick (1995) explained, “Investigators who favor the metaphor of information processing (e.g. Huber, Ullman, & Leifer, 1979) often view sensemaking, as they do most other problems, as a setting where people need more information. That is not what people need when they are overwhelmed by equivocality. Instead, they need values, priorities, and clarity about preferences” (pg. 27-28) to help them make sense of new products, which Rogers (1995) called “opinion leadership.” Without this discourse acting as a mechanism to infuse necessary information in the market to allow participants to better interpret and understand the implications of the new product, ignorance and uncertainty would still persist and the market would stall. Although much has been written about the market process in general, the mechanisms by which

market discourse influences this process has been largely overlooked. Specifically, does this market discourse take place spontaneously, or is there a catalytic force necessary to stimulate the discourse in the first place? I turn to Austrian economics to help find an answer.

Kirzner's analysis of the market process started in the state described above as disequilibrium, where ignorance (also referred to as information asymmetry) exists between the firm and the customer. In this instance, the alert entrepreneur is able to perceive the quality and value of the firm's good and the expectations and willingness to pay of the customer, who independently are unaware of the other's position. In this case, the customer is paying a higher price for a similar good without knowing an alternative exists or is not entering in to a transaction because no good exists that exceeds the customer's value threshold. The entrepreneur thus acts as an arbitrageur who corrects this market ignorance by brokering a deal between the two, moving the market towards equilibrium (Kirzner, 1973). Without the entrepreneur and his or her actions that help to educate the market regarding acceptable alternatives, the uncertainty and ignorance may never be resolved and a transaction may never take place; therefore, entrepreneurial action has an equilibrating effect.

Schumpeter, on the other hand, began his analysis near the state of equilibrium, where a commonly understood condition exists between the firm and the customer. Here, an entrepreneur acts to disrupt this condition by offering a new good with a higher level of quality or a lower price, which subsumes to better satisfy the needs of the customer and therefore becomes a competitor to the original firm. However, although an initial disruption occurs and has a disequilibrating effect of the relationship between the firm and the customer, the entrepreneur completes a transaction – albeit on different terms than the original condition – and therefore moves the market towards an equilibrium condition.

Interestingly, the entrepreneurial action in both of these cases is the same – the introduction of a good or service with either a higher level of quality or a lower price than currently exists. How can the same action have both an equilibrating and disequilibrating effect? I argue it's not the action in and of itself that has such differing effects, but the market discourse that is stimulated by the action that impacts the market process. Although each theory of entrepreneurial action has a differential effect on the state of the market, both have the same catalytic effect on market discourse. If only one firm and one customer existed, the impact of the entrepreneurial action would be isolated to those two parties and no market discourse would be generated. However, in a world where numerous firms and numerous customers exist, the entrepreneurial action releases new information into the marketplace and therefore stimulates market discourse among the many interested and affected groups of market participants. Discourse would not occur unless there were something to talk about in the first place, and the actions taken by entrepreneurs are significant enough in this context to give market participants something to talk about. Therefore, it is the discourse that acts to disseminate objective information and subjective opinion that is at the core of the market process.

Market Discourse

One particular communication mechanism market participants use to self-organize and reduce conflict is via discourse or debate (Weick, 1995). Discourse has been used in recent management literature to study the formation of institutions (Phillips et al., 2004), interfirm collaborations and collective identity (Hardy, Lawrence, & Grant, 2005), organizational change (Heracleous & Barrett, 2001), diffusion of innovations (Abrahamson, 1991), employee-management relations (Abrahamson, 1997), entrepreneurial legitimation (Lounsbury & Glynn, 2001), managerial practices (Abrahamson & Fairchild, 1999), and the formation and

interpretation of market categories (Kennedy, 2005; Rosa et al., 1999) (See Table 1 below for a review of relevant market discourse literature). 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 approaches to discourse highlight the need for discussion and debate to form public opinion (e.g. Blumer, 1947; Price, 1992) and in fact, “fundamental to the theory 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 evaluate the thoughts, opinions, experiences, and expressions of others to help deal with and interpret the new information introduced by entrepreneurial actions.

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, with the revision of these interpretations dependent 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).

Table 1: Relevant Literature on Market Discourse

Author(s)	Year	Journal	Definition	Operationalization
Phillips, Lawrence, & Hardy	(2004)	Academy of Management Review	A system of statements which constructs an object; discourses do not just describe things, they do things	Texts
Hardy, Lawrence, & Grant	(2005)	Academy of Management Review	A set of interrelated texts that, along with the related practices of text production, dissemination, and reception, bring an object or idea into being.	Face to face dialogue but also a variety of other discursive practices such as memos, letters, e-mails, and minutes of meetings
Green	(2004)	Academy of Management Review	Rhetoric is a type of instrumental discourse used to persuade audiences, reach reliable judgments or decisions, and coordinate social actions	N/A
Heracleous & Barrett	(2001)	Academy of Management Journal	Duality constituted by two dynamically interrelated levels (surface and deep) and dialogical accounts present conflicting perspectives and multiple realities	Interview transcripts, strategy documents, media reports, market publications, and transcribed ethnographic observations

Heracleous & Marshak	(2004)	Academy of Management Best Conference Proceedings	Organizational discourse conceptualizes organizational action as interrelated with the social interplay of linguistic phenomena	Conversations, metaphors, texts, narratives, stories, etc.
Fiss & Hirsch	(2005)	American Sociological Review	Public discourse where a shared understanding of change is primarily shaped and expressed through a collective public vocabulary	Newspaper articles and press releases
Rosa, Porac, Runser-Spanjol, & Saxon	(1999)	Journal of Marketing	Help create and affirm collective beliefs about current category boundaries and quality orderings within these categories	Consumer (Car & Driver, Consumer Reports) and Producer publications (Automotive News, Ward's Auto World)
Kennedy	(2005)	Poetics	Where there is discord, disagreement, or even disinformation about how to understand something new, third-party critics become especially important (sensemaking input)	Newspaper articles, industry publications, and press releases
Kennedy	(2008)	American Sociological Review	Patterns of association among market entrants found in relevant public discourse (media coverage)	Press releases and media co-mentions (references to more than one firm in the same news story or release)
Zilber	(2006)	Academy of Management	Rational myths are the shared	Newspaper articles and want-ads.

		Journal	meanings and understandings associated with social structures and are conceived as a source for formal structures, and organizations are understood as their dramatic enactment	
Martens, Jennings, & Jennings	(2007)	Academy of Management Journal	Stories, or narratives, are temporally sequenced accounts of interrelated events or actions undertaken by characters	Entrepreneurial narratives
Abrahamson & Fairchild	(1999)	Administrative Science Quarterly	Management discourse is what is said and written about management-related issues. Rhetorics are widely spoken and written discourses justifying the use of families of related techniques for managing employees	Academic/semi-academic articles and newspaper articles
Boje	(1995)	Academy of Management Journal	Discourse is the infinite play of differences in meanings mediated through socially constructed hegemonic practices, especially in stories	Disneyland's storytelling/public relations practices
Plowman, Baker, Beck,	(2007)	Academy of Management	Languages forms and expresses the	Qualitative case study of Mission

Kulkarni, Solansky, and Travis		Journal	underlying mind-set of an organization and gives importance to change because change is created, sustained and managed in and by communication	Church
Maguire & Hardy	(2009)	Academy of Management Journal	Texts are integral to the creation of meaning, but they do not function individually or independently; instead, meaning is created from collections of texts (discourse) that evolve from the ongoing production, distribution, and consumption of individual texts	Case study of deinstitutionalization of DDT insecticide use
Lee & Paruchuri	(2008)	Academy of Management Journal	Publicly available texts and media reports	Newspaper articles and press releases
Green, Li, & Nohria	(2009)	Academy of Management Journal	Rhetoric is discourse used to influence an audience toward some end	Selected journals, articles, and newspapers in Lexis Nexis (TQM adoption)

Although various definitions of the concept of discourse were used in prior research, one consistent use of discourse is a form of verbal and written communication that persists and works to construct a reality based on the social interpretations by discursive participants. Therefore, I use a definition of discourse to be 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 entrepreneurial actions, which helps to recreate or establish accepted market beliefs. From a general market viewpoint, discourse is manifest by media outlets, such as the popular press, local newspapers, and general business magazines. Industry-specific discourse comes in the form of trade publications and stock analysts, whose expertise and localized knowledge offer potentially unique contributions to general discourse. Firms themselves, including rivals, also engage in explicit communication by issuing press releases and implicit discourse by their actions, including introducing new products themselves. Finally, customers themselves engage in discourse by reviewing products and by being quoted in the mediums discussed above.

Although I use various media outlets to capture discourse, I am not studying the influence of media per se on the market process. Thus, 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, an examination of the underlying data in 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, this dissertation focuses on “market” discourse as opposed to simply media.

Recent work on discourse has also tackled this issue. For example, Rosa and colleagues (1999) particularly focused on “stories” told by producers and consumers via published media. They viewed stories as “critical sensemaking tools” (e.g. Weick, 1995; White, 1992) where objective and subjective information is “rebroadcast” via media outlets. Of note, they restricted their examination of the creation of new categories in the automobile industry to selected producer and consumer text, whereas this dissertation expands the discourse to include other interested stakeholders. In addition, Kennedy (2008) viewed the sensemaking process as mediated by independent third-party media outlets who are bound by “professional journalistic norms” to favor neither producers nor consumers based on any type of payment or social obligation, thereby being in an important position to disseminate information without necessarily steering readers in one direction or another in an unethical manner. Although research on public relations efforts by firms have been shown to influence market opinion initially (Fiss & Zajac, 2006; Kuperman, 2003), how discourse evolves and is part of the social construction process is the focus of this dissertation. Of further note, Kennedy (2008) focused on press releases of firms as a way to capture the voice of the producer and rival firms, but did not necessarily incorporate the viewpoints of other market participants. Finally, Lee and Paruchuri (2008) highlighted

“media rhetoric” and investigated how the media serve as an intermediary between producers and consumers to aid the market in either accepting or rejecting market activities (Burke, 1969; Suddaby & Greenwood, 2005). They looked specifically at media “co-mentions” where firms and new markets are mentioned together by the media.

In sum, following the conception of discourse and media mentioned above, this dissertation 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 attempts to further unpack how discourse gets formed and how it influences the market process.

In particular, I focus on four key measures of discourse: duration, volume, frequency, and tenor. Duration is how long the discourse lasts and is the difference in time between the first mention of the product in the market and the last mention. Volume is the cumulative number of articles that mention a specific entrepreneurial action and captures the total magnitude of discourse. Frequency is a measure of how concentrated the discourse is over time and is the volume divided by a certain time period, such as a quarter, month, or week. Combined, these three measures capture the *intensity* of market discourse, with a high volume of discourse at a more frequent rate that lasts a longer time showing that the market is actively discussing the entrepreneurial action. The final measure of discourse represents the uncertainty and conflict of the market as measured by the tenor of that discourse. When little variance in that tenor exists, the market opinion is essentially formed; predominantly positive discourse indicates acceptance whereas predominantly negative discourse shows rejection. However, when a mix of positive

and negative discourse exists, this indicates the market is still in the process of making sense of the new product and is conflicted regarding the interpretation of that product. Further discussion and examples of these measures are discussed in Chapter 4.

Discourse focused specifically on the acceptance of new products and innovations has been the topic of prior research. In particular, the diffusion of innovation research has focused on how new products or innovations are accepted or rejected by market participants. 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; 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). In addition, “innovativeness” is most frequently used as a measure of the degree of newness of an innovation.

Although commonly accepted definitions of innovation exist in extant literature, much confusion exists with regards to the types and measurements of innovation. Types of innovation include: revolutionary versus evolutionary, new versus extensions, original versus adapted, pioneering versus modifying, basic versus improvements (Green et al., 1995), radical versus routine, discontinuous or radical versus incremental, or core versus peripheral (Gatignon et al., 2002), modular, and architectural (Henderson & Clark, 1990), generational competence-enhancing vs. competence-destroying (Tushman & Anderson, 1986), disruptive (Govindarajan &

Kopalle, 2006). This prior research has freely admitted that, “no commonly accepted definition or measure of radical innovation” exists (Green et al., 1995: 203), “the boundaries of these concepts are, however, often not clear or consistent” and a “lack of agreement (exists) in the literature” (Gatignon et al., 2002: 1103).

Further complicating matters is the fact that the measurement of innovation has also been inconsistent and varied in prior research. In fact, Garcia & Calantone (2002) identified 15 constructs and 51 distinct measures from the extant new product development literature alone. Extant literature has also focused on innovation from the focal firm perspective or a limited sample of the market. Methods to determine how innovative something is have been limited to surveys (e.g. Gatignon et al., 2002; Green et al., 1995) lab-based measures (e.g. Gregan-Paxton, Hibbard, Brunel, & Azar, 2002; Gregan-Paxton & Moreau, 2003; Hoeffler, 2003), or industry experts (e.g. Min, Kalwani, & Robinson, 2006). As such, a reliable measure for innovation based on a large archival sample is lacking, which is further discussed in Chapter 4 below.

Even with the difficulties in defining and measuring innovations, Rogers’ (1995) review of the relevant diffusion literature has several important parallels with the phenomenon of market discourse described above. In particular, Rogers (1995) outlined four main elements of the diffusion process: 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 adoption or rejection of the innovation. In essence, then, this decision making process matches closely with the sensemaking market process described above. Specifically, the innovation acts as the “surprise” to start off the diffusion/sensemaking process, plausible explanations and implications are communicated, time

is necessary to make that communication retrospective, and the tangible medium is incorporated in the social system interpreting the innovation.

Rogers (1995) presented five stages in the innovation decision process: knowledge (where market participants initially learn about innovation and gains some understanding of how it functions), persuasion (when market participants form a favorable or unfavorable attitude toward the innovation), decision (when market participants engage in activities that lead to a choice to adopt or reject the innovation), implementation (where market participants have actually accepted the innovation and put it into use), and confirmation (where market participants seek reinforcement of the acceptance decision). This dissertation is especially concerned with the factors that influence the first two stages, namely knowledge and persuasion, which is what I call collectively market discourse. In addition, I further examine how discourse plays an important role for the customer purchase decision, which impacts the performance of the new product.

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, which again parallels my earlier discussion of equilibrium and disequilibrium. As new products by definition are unproved and are thus housed in uncertainty, various market participants will initially have diverging views regarding that innovation and will seek information in order to reduce their uncertainty. The innovation decision, 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).

The two main sources of information used to reduce uncertainty are via mass media channels and interpersonal networks, such as friends, family members, co-workers, etc. Rogers (1995) argued that the knowledge stage is most appropriate for objective characteristics of the innovation, which is predominantly found in mass media outlets. However, the persuasion stage seeks for subjective information and is most commonly obtained via interpersonal “near-peer” networks. A combination of both objective and subjective information reflecting public opinion may be needed for market participants to make an informed decision regarding the acceptance or rejection of an innovation, depending on the individual characteristics of the particular participant, as discussed above. 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.

Stakeholder View of Market Discourse and the Market Process

Although the market process described above has been simplified for discussion purposes, in actuality, it is much more complex, partially due to the various market participants that have a vested interest in this process. The more a particular market participant has a vested interest in the outcome of the market process, the more active that participant will be in ensuring the outcome is favorable. Stakeholder theory highlights how both individuals and groups that are affected by a firm’s actions can in turn affect the actions and decisions made by the firm

(Freeman, 1984; Grunig, 1992). For example, customers, potential supply chain partners (to include suppliers of parts for the goods sold and distributors or retailers that may sell the goods), and other rival firms in the industry are all important stakeholder groups that are impacted by entrepreneurial actions (DiMaggio & Powell, 1983; Elsbach, 2003; Freeman, 1984). In addition, these three groups of market participants, which I will label customers, complementors, and competitors, respectively, can influence the market discourse and sensemaking activities that follow entrepreneurial actions. The market process can therefore exist at two primary levels: within and between individuals and within and between stakeholder groups. In this next section, I will explore both how key stakeholder groups or market participants are influenced by the entrepreneurial actions of firms and how these groups in turn influence the market discourse following such actions.

When talking about “the market” and “market participants,” difficulty exists when referring to all participants as equals, as prior diffusion research has categorized participants based on their relative rate of adoption. Rate of adoption is usually measured using an innovation in a system, rather than an individual, as the unit of analysis, so instead of looking at individual customer’s purchase decisions, adoption is measured as the collective group of all individuals. Within this adoption system, the following categories are most commonly used: innovator/early adopter, early majority, late majority, and laggard (Rogers, 1995). Research devoted to these categories has found that differences exist based on personality characteristics, socioeconomic conditions, and communication behavior. For example, innovators and early adopters have been shown to have a higher risk propensity, lower uncertainty avoidance, higher domain knowledge, to proactively seek information via mass media channels, to have wide interpersonal networks, and to be less dependent on subjective evaluations from others (see

Rogers, 1995 for a review). Therefore, depending on the individual characteristics above, the uncertainty following an entrepreneurial action may cause more or less uncertainty for the particular market participant, which would then determine the level of sensemaking needed and the impact market discourse will have on the decision to accept or reject the new product. Similarly, other market participants will also have various levels of the above characteristics, which may influence how much or how often these stakeholders are involved in the sensemaking and market discourse process.

Pfarrer, DeCelles, Smith, and Taylor (2008) presented a stakeholder model following “transgressions” of firms and how various stakeholders – including the transgressing firm – dealt with the consequences of that transgression. Although the initial product in this discussion is an entrepreneurial action and therefore diverges somewhat from their focus on corrupt organizations, the model presented by Pfarrer and colleagues (2008) has many interesting similarities to the market process. Because firms do not exist in a vacuum, the products they produce impact numerous stakeholders, who, in turn, provide feedback to the firm that helps signal the appropriateness and acceptability of that product. This iterative process between various stakeholder groups and the focal firm unfolds as new products are introduced and market participants make sense of the new products, described as the “action-stakeholder discourse-stakeholder feedback” loop (Pfarrer et al., 2008; Smith & Cao, 2007). An important extension to this argument is that the opinions of stakeholders not only influence focal firm actions, but will also influence other market participants’ opinions and actions as well, which is integral to the market process.

However, within each stakeholder group, all members are not homogeneous with respect to their personalities and capabilities for understanding the new product as well as their

prominence and influence within that group and the level to which the entrepreneurial action will affect them. Rogers' (1995) review of the diffusion of innovation literature highlighted how market participants are segregated based on how fast they adopt the innovation, with "early adopters" being more likely to have a higher degree of domain knowledge, higher risk propensity, lower uncertainty avoidance, etc. In addition, Pfarrer and colleagues (2008) proposed that stakeholder groups be divided into a pyramid of three general classes (from the top to bottom): elite and active, attentive and aware, and latent and inactive (Price, 1992) and argued firm actions are more salient to those higher on the pyramid and in turn, these stakeholders exhibit more power and influence over the focal firm (Vercic & Grunig, 1995).

Rogers (1995) also highlighted the role of opinion leaders in the innovation adoption decision making process. Opinion leaders are able to influence others' attitudes and/or behaviors with relative frequency. A central concept that allows opinion leaders to be influential is social learning theory, which argues that observational modeling is an important factor by which individuals learn (Bandura, 1977). Thus, by observing another person's behavior or beliefs and then doing something similarly, individuals learn what appropriate or acceptable behavior is. Rogers (1995) added to this the idea that neither verbal exchange nor direct contact is required, but "interaction" via the mass media is sufficient for this learning to occur. Consistent with the stakeholder model discussed above, instead of the "model" being an individual, I argue an influential partner or distributor could act as an opinion leader, as acceptance or rejection by this party could signal to the rest of the market the legitimacy or illegitimacy of the innovation (DiMaggio & Powell, 1983; Grimm et al., 2006; Lee, Smith, Grimm, & Schomburg, 2000). For example, as discussed above, if Wal-mart decided to sell a certain product, its massive market presence and distribution capabilities could influence the rate of adoption for that particular

innovation. Similarly, imitation by key rivals can also serve to legitimize the original product, with the comparison to the original serving to increase the amount of discourse related to the entrepreneurial action of the focal firm.

Discourse within and among market participants with a vested interest occurs following an entrepreneurial action to help them make sense and form an opinion of the new product. Pfarrer and colleagues (2008) argued that while all stakeholder group members will not initially hold the same opinion of the entrepreneurial action, the discourse that takes place eventually results in concurrence, which is a widely shared opinion regarding the appropriateness of the product. They point out that concurrence does not mean unanimity, but that a “dominant opinion” (Sturges, 1994: 302) is sufficient to influence the market process. How the various market participants can influence market discourse and the market process is explored in the following sections.

Customers

The diffusion of innovation literature has primarily focused on how customers – both individually and as a collective whole – adopt new products and processes (see Rogers, 1995 for a review). As new products are introduced into the market, new information causes uncertainty or unpredictability regarding the implications and consequences of that product, which opens up the possibility for inconsistent or incompatible interpretations of the product. Especially important to the discussion of discourse is the fact that this uncertainty, “motivates an individual to seek information” (Rogers, 1995). As these individual customers seek information, they are influenced by the new information introduced by the product itself as well as by both the mass media and by individuals around them, such as friends, relatives, co-workers, other stakeholders,

etc. This information can help reduce the uncertainty surrounding the new product, allowing them to make an informed decision whether or not to accept and/or endorse that product.

In turn, as acceptance or rejection is determined, individual opinion leaders and early adopters can engage in discourse themselves, which could manifest itself in product reviews, blogs, purchases, and face-to-face communication that describe their personal experience with the newly introduced product, which is what marketing literature refers to as “word of mouth” (Herr, Kardes, & Kim, 1991). The prominence of these influential elites can impact how discourse takes place, as the more these elites are able to shape the discourse of the market, the quicker a resolution will be met and the sooner the discourse will end (Rindova, Williamson, Petkova, & Sever, 2005; Rogers, 1995).

Complementors

Complementors are those firms that are not direct competitors to the focal entrepreneurial firm but who also have a vested interest in the success of the product. Examples include suppliers, distributors, alliance partners, manufacturers of peripheral products that compliment the product, or even stockholders and other investors. Entrepreneurial actions are inherently more risky, which makes the success of the product more uncertain (March, 1991). As such, complementor stakeholders are motivated to make sense of the implications and consequences of the entrepreneurial action in order to make further financial and strategic decisions.

Complementors themselves also have a special role to play in the success of entrepreneurial actions, based primarily on the status or reputation of the involved market participants themselves. When prominent suppliers or distributors align themselves with an entrepreneurial action, this can act as a signal of legitimacy, which can lead to acceptance of the new product (Rindova, Pollock, & Hayward, 2006). For example, in the DVD industry, a recent

“format war” between Blu-ray and HD DVD occurred, with various manufacturers vying for which format would become the dominant design and standard for the industry. Both had the backing of various movie production studios, but it was the decision by Wal-mart, following other retailers such as Best Buy and Netflix and content providers like Warner Brothers, Walt Disney, and 20th Century Fox, to exclusively distribute Blu-ray in its stores that led to the demise of the HD DVD format and the establishment of Blu-ray as the standard (Richtel & Taub, 2008). Therefore, by their actions, these suppliers and distributors engaged in discourse that signaled to the market their acceptance of the new product, thereby influencing the dynamics of the market process.

Similarly, peripheral products that help support or enhance the functionality of the original entrepreneurial action can influence the market’s acceptance of the product. The iPhone has generated a lot of “buzz” in the wireless phone industry since it was introduced, but has also attracted a lot of software and application developers from outside the industry as well. Thus, with each “app” that is generated and applied to the iPhone, the more attractive it becomes to an increasingly larger audience, thereby increasing its likelihood of acceptance. Here again, discourse is in the form of verbal and written communication but is also manifested by the actions of related firms, whether explicitly considered official business partners or not.

Other resource providers, including stockholders, are also important complementors in the market process. Although not business partners per se, stockholders provide a mechanism for firms to raise capital necessary for its operations and strategic implementation. Stock prices and other market mechanisms serve to distribute information and correct ignorance (Hayek, 1949; Hayek & McCloughry, 1984; Kirzner, 1973) and can act to influence the market as discourse is used to interpret the meaning of the change in stock price. According to the efficient

market hypothesis, stock prices completely reflect all publicly relevant information and can be an unbiased reflection of the underlying value of the focal firm (Fama, 1976; Markovitch, Steckel, & Yeung, 2005). Importantly, stock prices can be a means of communicating market opinion as they change in response to firm actions (Fama, 1976; Markovitch et al., 2005).

Competitors

Competing firms also are impacted by entrepreneurial actions of other firms, but only to the extent that actions by rival firms are noticed by their competitors and are able and willing to respond. Building on the awareness-motivation-capabilities framework, competitive dynamics research has explored how managers respond to competitive actions only to the extent they are aware of the action, are motivated to respond, and are capable of responding (e.g. Chen, 1996; Livengood & Reger, 2010; Smith et al., 1991). Once noticed, rivals must make sense of the new product and then determine if that product will be a threat or an opportunity and, if so, how to respond. If the entrepreneurial action is quickly accepted by the market, or is anticipated to be accepted, the rival firm may choose to invest in the capability-building activities necessary to compete directly with the new product. Or, the rival could simply imitate what the initial firm did, which could have varying effects on the original product. On one hand, increased competition could reduce the acceptance of the original product as more options are now available. On the other hand, imitation of a radical new product could serve to legitimize the product (DiMaggio & Powell, 1983; Grimm et al., 2006; Lee et al., 2000) and lead to an increase in its acceptance, particularly as subsequent imitations fall short of the original.

Discourse by rivals can also take several different forms that can influence the market process. For example, competitor responses could range from endorsement (positive tenor), undermining (negative tenor), or ignoring (neutral or non-existent tenor)(Pollock & Rindova,

2003). Competing firms that have capabilities to imitate the product and will benefit from increased total demand in the industry may endorse the product (Barney, 1991). Firms unable to imitate the product will attempt to undermine the product. For example, when Southwest entered the “Texas Triangle” of Dallas, Houston, and San Antonio, competing airlines in Texas attempted to undermine this action by discounting Southwest’s attachment to smaller airports like Love Field and lobbied to pass Wright Amendment, which restricted travel to Arkansas, Louisiana, New Mexico, and Oklahoma from Love Field. Undermining might also be used as a delaying tactic to suppress the success of the entrepreneurial action until the competing firm has obtained or accumulated the necessary capabilities to imitate the initial action. Competitors who don’t see the entrepreneurial action as a threat will simply ignore it and not engage in discourse.

Chapter 3: Hypotheses

The following hypotheses are divided into two sections to match the two stages of analyses performed on entrepreneurial action, market discourse, and performance. The first stage is an archival study that looks primarily of the macro-level forces involved with the impact of entrepreneurial actions on market discourse and the market process, which includes characteristics of the new product, the firm introducing the product, and prevailing industry conditions. The second stage is also an archival study that examines the impact of discourse on subsequent sales of cell phones at the individual handset level. In order to tie the two stages together, I also explore the mediating effect of discourse between novelty and performance. As will be discussed further in Chapter 4 below, I shift the unit of analysis slightly to best match the variables of interest. In Stage 1, the unit of analysis is the handset level and all pertinent discourse related to each discreet new phone is captured on a general basis, meaning variables such as duration and volume cover the entire period of discourse for each specific phone. For Stage 2, however, my examination changes to capture discourse and performance on a monthly basis, so the unit of analysis changes accordingly to the handset-month level, with number of articles per month and number of sales per month the key independent and dependent variables, respectively.

Hypotheses for Stage 1 (Discourse)

I begin my analysis with the focal firm and explored how both the characteristics of the new product as well as the firm itself impacts uncertainty and therefore market discourse. I then look at how general industry and environmental conditions, such as competitive intensity, can influence the relationship between new actions by firms, uncertainty, and subsequent market discourse. Most importantly, I explore how both reputation and competitive intensity can act as

a substitute for market discourse to reduce uncertainty following entrepreneurial actions to actually reduce the level of sensemaking needed by the market.

Novelty

The characteristics of the new product itself have been found to influence the innovation decision process. In particular, five characteristics of innovations used to determine its rate of adoption: relative advantage, compatibility, complexity, trialability, and observability (Rogers, 1995). Relative advantage is how much an innovation is perceived to be better than what it supersedes and is positively related to the rate of adoption. Compatibility is how much an innovation is perceived to be consistent with existing values, past experiences, and the needs of market participants, which is positively related to the rate of adoption. Complexity is how much an innovation is perceived to be relatively difficult to understand and use, which is negatively related to the rate of adoption. Trialability is how much an innovation may be experimented with on a limited basis prior to making the acceptance decision and is positively related to the rate of adoption. Finally, observability is how much the results of an innovation are visible to others, which is positively related to the rate of adoption. As an example, the wireless telephone itself as a general innovation rated very well on each attribute, thus contributing to its relatively quick rate of adoption in the United States – the cellular phone is portable and improves time management, connects with existing telephone systems, is used just like a regular phone, is able to be observed by many others, and can be easily borrowed or used on a trial basis (Rogers, 1995). What is perhaps most pertinent to individual firms in the wireless telephone industry, however, is how individual entrepreneurial actions – such as new cell phone models – compare to each other to contribute to this overall rate of adoption, which is the focus of this study.

Entrepreneurship has been studied in various forms throughout management and economic literature. At its heart, entrepreneurship involves the creation of new goods, new

methods of production, new markets, new sources of supply, and sometimes entirely new ventures (Schumpeter, 1934). In fact, some scholars see entrepreneurship as an integral mechanism in achieving the ultimate goal for markets and those involved in the market process. For example, Hayek (1949) sees the solution to the economic problem of society 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). This exploration and discovery is at the core of entrepreneurial action, which is the identification, evaluation, and exploitation of opportunities and the creation of new organizations (Grimm et al., 2006).

Other Austrian economists, including Schumpeter and Kirzner, viewed the entrepreneurial manager as the driving force of competitive business interactions and the leaders of the market process. However, their viewpoints diverged regarding entrepreneurial opportunities and actions. Kirzner viewed the entrepreneur as one who is able to see market imperfections – based on information asymmetry – and create situations to move the market towards equilibrium (Kirzner, 1973); it is this “alertness” to (not necessarily the creation of) new knowledge that leads to new opportunities that allow the entrepreneur to add value to society and the market process. Schumpeter, on the other hand, saw the individual characteristics and capabilities – namely motivation, attitude, and risk aversion – of the entrepreneur as the driving force for the creation of new ways of doing things (McMullen & Shepherd, 2006). Without the entrepreneur, new knowledge – housed in entrepreneurial actions – would not be brought to the market, thus making them economically irrelevant (Schumpeter, 1934).

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 by concluding one of the things

we notice are "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 by new information that is different than current beliefs, market participants who are aware of the change must react (with "doing nothing" itself also viewed as an action of rejection). As discussed above, when uncertainty is caused by this new information, market participants seek both objective and subjective information to help resolve this uncertainty (Rogers, 1995). The more innovative the new product is, 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. Accordingly, I expect the following:

Hypothesis 1: The greater the degree of novelty of an entrepreneurial action, the greater the intensity (duration, volume, and frequency) of market discourse

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. More formally,

Hypothesis 2: The greater the degree of novelty of an entrepreneurial action, the greater the conflict (variance in tenor) of market opinion

Reputation

When examining the interaction between the firm and the customer, certain characteristics of each will impact the nature and outcome of the relationship. Schumpeter (1934) reasoned, “The producer as a rule initiates economic change, and consumers are educated by him if necessary; they are, as it were, taught to want new things, or things which differ in some respect or other from those which they have been in the habit of using.” For the firm, reputation can have a big effect on how successful it will be in the marketplace. Reputation is defined as, “stakeholders’ perceptions about an organization’s ability to create value relative to competitors” (Rindova et al., 2005: 1033) and can act to increase the amount of information the market has about a firm and its actions. For example, when a firm introduces a new product, the type, number, value, etc. of 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 and the customer can use the reputation of the firm to help make sense of subsequent actions (Clark & Montgomery, 1998; Fombrun & Shanley, 1990; Weigelt & Camerer, 1988). All else equal, a firm that has a positive reputation for quality, innovativeness, value, etc. will be better received than a firm that lacks in those areas.

When faced with uncertainty about a new product, market participants will look for other signals as informational cues to reduce this uncertainty. A firm's reputation can help reduce uncertainty of its products, as the market already has a base level of information to work from and reputation helps to legitimize the likelihood of the new product being acceptable to the market. In this case, reputation becomes a substitute for discourse as a sensemaking activity since the market might already have the basis of a pre-formed opinion of that firm's prior products, which will be easier to categorize and make sense of. 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 I 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. As such, I hypothesize the following:

Hypothesis 3: The higher the reputation of the firm, the lower the intensity and conflict of market discourse

Competitive intensity

Scholars studying actions and reactions of firms have recently found how important existing industry conditions are for firm performance (e.g. Derfus, Maggitti, Grimm, & Smith, 2008; Ferrier, Smith, & Grimm, 1999; Schmalensee, 2000; Vaaler & McNamara, 2010).

Particularly, the environment for rivalry and the rate of change in the industry were found to be important factors that influence the impact of firm actions. The level of competitive intensity in the focal industry acts in two ways to reduce the intensity of market discourse as new products introduced by other firms both compete for the attention of the focal new product but also help

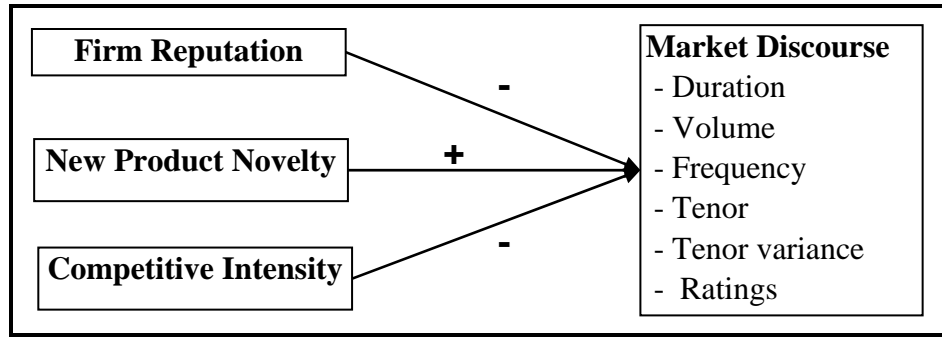
market participants to make sense of the new product by increasing reference points for comparison to the new product.

Competitive intensity is a measure of the relative market power of firms in an industry and the extent to which those firms compete with each other. When industries have a higher degree of large, powerful firms, these firms have sufficient market power and resources to compete vigorously against each other (Scherer & Ross, 1990). Also, in this environment, market participants have fewer choices and are therefore more likely to follow the actions of the dominant firms, and the awareness of the actions of rivals will also be higher as they are more likely to garner the attention of competitors (Derfus et al., 2008). When the rate of change of technology in an industry is high, which is an outcome of increased competitive activity between rival firms, market participants don't have the luxury of a long period of time to interpret new products by firms and make decisions (Eisenhardt, 1989). In an industry where firms are frequently introducing new technological improvements and innovations, the impact of any one particular new product will be lessened, as a new innovation and improvement will soon take its place. While market participants are learning about a new product by one firm, another firm might quickly introduce its own new product. This competition for being "new" in the market will distract the market from other firms' products and create "noise" as rival products are vying for the attention of market participants. However, with more products in existence, the market will have more bases of comparison that will aid in comparison and categorization (Fiske & Taylor, 1991; Porac & Thomas, 1994), which will help reduce uncertainty and the subsequent market discourse surrounding each discrete product will be attenuated. As such, I expect the following

Hypothesis 4: The greater the competitive intensity, the lower the intensity and conflict of market discourse

See figure 2 below for a graphical representation of the hypothesized influence of entrepreneurial action, firm, and industry characteristics on market discourse.

Figure 2: Model of Research Hypotheses (Stage 1)



Hypotheses for Stage 2 (Performance)

The second stage of analysis investigates how discourse related to specific entrepreneurial actions can influence the level of sales at the handset level. Specifically, I look at how the number of articles in the months preceding the sales of the handsets can impact those sales, which can highlight the importance of studying discourse to predict the performance of new cell phones. As was previously argued, discourse is a key sensemaking mechanism to help reduce the uncertainty following a new product introduction, which is especially necessary when new phones are more novel. The question remains, however, regarding the impact of this sensemaking on performance outcomes, namely sales of those new products. Even if novelty is positively related to uncertainty and discourse, if this sensemaking process does not impact performance, the need to study it by strategic management scholars in the first place may be called into question.

Market discourse has been described as a medium to disseminate both objective information as well as subjective opinion about a firm’s entrepreneurial action. Rogers (1995) argued that both types of information are necessary to diffuse innovations and Weick (1995)

highlighted the need for information in order for the sensemaking process to occur. According to work done in consumer behavior research following novel products (e.g. Hoeffler, 2003), customers are less likely to make a purchase decision when faced with high levels of uncertainty. Obviously this behavior will change depending on the nature of the purchase (i.e. “impulse” or inexpensive goods versus big ticket items) and the risk propensity of the individual consumer (Rogers, 1995), but in general consumers are more comfortable with lower levels of uncertainty and will therefore be more likely to make purchases when uncertainty is reduced. As discourse is viewed as a sensemaking and therefore uncertainty-reducing mechanism, I would expect higher levels of discourse to lead to higher levels of sales. In addition, market discourse acts to increase awareness of a new product, but also provides objective information about the features of the phone as well as subjective opinion based on other market participants’ interpretations. This increase in information provided by discourse will lead to increased acceptance of the new product, which would then result in higher sales. Further, since market discourse makes both the objective information and subjective opinion (based on evaluations) widely available to the public (Pollock & Rindova, 2003), discourse helps to legitimize such information by creating availability cascades that act to increase the tendency that the information provided is perceived to be more plausible (Kuran & Sunstein, 1999; Pollock & Rindova, 2003).

In essence, the volume of discourse, as measured by the number of articles related to a particular new product, becomes a proxy for overall coverage or visibility (Kennedy, 2008). Although coverage or visibility per se are not sufficient for an increase in performance (Fombrun & Shanley, 1990), they can lead to an increase in prominence (Rindova et al., 2005), a factor that has been found to contribute to higher market valuations (Pollock & Rindova, 2003) and return on assets (Deephouse, 2000). In addition, when competition for attention exists, coverage is an

important measure of performance (Kennedy, 2008). Pollock and Rindova (2003) specifically examined exposure, which is a result of the transmission of information by the media and, “makes it possible for audiences to ‘experience’ otherwise distant events” (Pollock & Rindova, 2003: 633). They highlight three specific mechanisms that could tie exposure to an increase in performance, namely familiarity (Harrison, 1977; Zajonc, 1968), repetition (Hawkins & Hoch, 1992), and reduced riskiness (or uncertainty) as a result of increased information (Heath & Tversky, 1991). As such, I would expect an increase in coverage to be positively related to performance, measured here as the number of handsets sold per month. More formally,

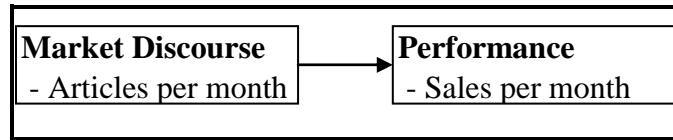
Hypothesis 5a: The greater the level of market discourse (number of articles per month) the higher the level of subsequent sales

However, the impact of discourse is not expected to be equal over time. As discussed above, the market process – and particularly the sensemaking process – is one that is dynamic and longitudinal in nature (Weick, 1995). Customers use discourse to help reduce uncertainty in order to make an informed purchase decision, and therefore the discourse that will matter the most is that which occurs near the time of purchase because once uncertainty is reduced to an acceptable level, a customer is more inclined to make a purchase (Hoeffler, 2003). In addition, social cognitive research on memory points to the importance of retrieval, which is easier to perform when the information has been more recently received (Fiske & Taylor, 1991). As such, I would expect discourse occurring just prior to the purchase decision to be more impactful than discourse that occurs at an earlier period of time.

Hypothesis 5b: Recent discourse (number of articles per month) will have a greater effect on sales than temporally distant discourse

See Figure 3 for a graphical representation of the proposed hypotheses for Stage 2 with performance as the dependent variable.

Figure 3: Model of Research Hypotheses (Stage 2)



Synthesis of two stages

For the first stage, the antecedents of discourse were examined, focusing on selected product-, firm-, and industry-level characteristics with discourse as the outcome. In the second stage, discourse was viewed as the independent variable, with performance as the outcome of interest. Therefore, in order to tie the two stages together, the intermediary effects of discourse between phone novelty and sales are of central importance.

Strategic management scholars who have looked at firm actions and subsequent reactions by the market have often overlooked the role market discourse plays in that process. It is in the discourse where the market's opinion is both shared and shaped by the interactive sensemaking processes of market participants. When firms release new products to the market – particularly technology-based innovations – the complete value of the product is rarely known a priori. Prior work on the social construction of technology highlights how value is a matter of perception based on the interpretations and collective activities of the market (e.g. Callon, 1987; Davis & Taylor, 1976; Hughes, 1987; Klein & Kleinman, 2002; Pinch & Bijker, 1984). Thus simply looking at firm actions and then directly looking at performance outcomes may overlook the importance the social construction processes exhibited in discourse plays in the market's eventual acceptance or rejection of the new product as manifested by the purchase decision.

In particular, this dissertation is mainly concerned with the uncertainty caused by novel products introduced into the market, with discourse as the key sensemaking mechanism to reduce

this uncertainty to help market participants make decisions. Therefore, I do not look directly at the impact of product novelty on performance but rather examine the mediating effects of discourse on eventual performance outcomes. Because of the key role of discourse in that process, I expect discourse to mediate the relationship between product novelty and performance.

Hypothesis 6: Discourse (number of articles per month) will mediate the relationship between new product novelty and performance (sales per month)

See Figure 4 for a graphical representation of the mediated model that connects both stages of research and Table 2 that summarizes all hypotheses.

Figure 4: Mediation Model of Research Hypotheses



Table 2: Summary of Research Hypotheses

Hypothesis	Dependent variable	Source	Independent variable	Source
<i>New Product Novelty</i>				
<i>H1: The greater the degree of novelty of an entrepreneurial action, the greater the intensity of market discourse</i>	Intensity (duration, volume, and frequency)	Factiva	Product novelty relative to all other previously released phones	Phonescoop, Wireless Week, RCR Wireless News, FCC Database
<i>H2: The greater the degree of novelty of an entrepreneurial action, the greater the conflict of market discourse</i>	Tenor variance	Factiva (LIWC text analysis)	Product novelty relative to all other previously released phones	Phonescoop, Wireless Week, RCR Wireless News, FCC Database
<i>Reputation</i>				
<i>H3: The higher the reputation of the firm, the lower the intensity and conflict of market discourse</i>	Intensity (duration, volume, and frequency) and conflict (variance in tenor)	Factiva	Reputation	Fortune Most Admired company rankings

Competitive Intensity				
<i>H4: The greater the competitive intensity, the lower the intensity and conflict of market discourse</i>	Intensity (duration, volume, and frequency) and conflict (variance in tenor)	Factiva	Competitive intensity	FCC Competition Reports/New Product Database
Performance				
<i>H5a: The greater the level of market discourse the higher the level of subsequent sales</i>	Performance (sales per month)	NPD Group	Discourse (articles per month)	Factiva
<i>H5b: Recent discourse will have a greater effect on sales than temporally distant discourse</i>	Performance (sales per month)	NPD Group	Discourse (articles per month)	Factiva
Mediation				
<i>H6: Discourse will mediate the relationship between new product novelty and performance</i>	Performance (sales per month)	NPD Group	Novelty and Discourse (articles per month)	Factiva/ Phonescoop, Wireless Week, RCR Wireless News, FCC Database

Chapter 4: Research Methods

Overview and samplings

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 effectively de-regulated 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 de-regulation, the wireless telephone industry grew rapidly, with many innovations, market entrants, and services introduced to the market. This high-velocity, dynamic environment is especially appropriate for the study of entrepreneurial actions and uncertainty because of the growth and changes in the wireless telephone industry.

Specifically, the following top six firms (including those firms that were merged or acquired during the period of study) that made up approximately 90% or greater of the US wireless industry during the time of study will be the focus of my 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

Although the number of researchers focusing on the diffusion of innovations has increased (ironically following an S-shaped curve itself), criticisms of diffusion research exist.

The most prevalent and pertinent criticism is what is known as the “pro-innovation bias” (Rogers, 1995). This bias is based on the conception that innovations are great and therefore should always be accepted, which most commonly occurs because data is usually gathered on successful innovations after a high percentage of adoption. The two most effective ways to combat this bias is to collect data throughout the diffusion process at various time periods and to select both successful and unsuccessful innovations. As will be discussed in the following sections, both means to reduce the pro-innovation bias were implemented in this dissertation.

Data was collected primarily via archival sources to better understand the market discourse that follows an entrepreneurial action. The FCC is an independent United States government agency, regulating interstate and international communications by radio, television, wire, satellite and cable. The FCC's 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 US, insuring compliance with spectrum allocations, technical standards, and safe SAR (radiation) levels. As such, the FCC maintains a database of all 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 identified.

Once these initial new products were identified, specific information regarding each handset was gathered, primarily from three sources. Phonescoop is an independent researcher of the wireless telephone industry and maintains a database of phone characteristics, beginning in 2002. Using these classifications as a template, detailed information about each phone model was gathered and compared to ascertain important variables, such as novelty, for all the handsets identified from the FCC database. In addition, 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. Finally, RCR Wireless also tracks events relating to the wireless telephone industry, and has a database of articles dating back to 1994. All three 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 online archives, as well as information from the FCC database and product-specific user manuals, I identified all relevant phone features and cross-validated 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 was the primary source to capture the discourse related to that specific product (Fiss & Hirsch, 2005). I enlisted the aid of two undergraduate research assistants in the business school from the University of Maryland who were given the keywords and asked to enter them in to Factiva to capture all related articles. They scanned the articles to ensure they indeed were related to the new cell phone of interest and then captured various characteristics of the discourse – used to later calculate key discourse variables, such as duration, volume, and frequency – as well as other supplemental information, including the carrier of the phone and the initial price offered. To help validate their work, I initially gave them approximately 10% of the phones identified from the FCC database as a trial run. I reviewed their work and any discrepancies were immediately discussed to ensure proper procedures were followed on the rest of the sample. In addition, I collected data from the undergraduates on a weekly basis during the first 2 weeks and checked to ensure accuracy and completeness without exception.

I collected data on all new products in the FCC database and their corresponding phone-level characteristics from 1998 through 2009, but I have only included new products introduced up to the end of 2007 to allow the discourse related to those products to be properly analyzed. Although some right truncation of the discourse will inevitably occur because the discourse plays out over time, allowing at least approximately two years of discourse for all phones in the database will help to attenuate the negative effects of this truncation.

Variables

Dependent variables (Stage 1 – Discourse)

As discussed above, I analyzed the data in two stages and therefore have two sets of independent and dependent variables. The first stage focused on market discourse as an outcome, with the following aspects of discourse emphasized:

Duration: This is a measure of how long the discourse related to a particular new phone lasted. To calculate this, I took the date of the last article to mention the focal phone and subtracted the date of the first article to mention the focal phone, which resulted in the number of days the phone was discussed by market participants.

Volume: This represents a count variable of the total number of articles that referenced a particular phone.

Frequency: This variable measures the concentration of the discourse over time, calculated by taking the total number of articles that mention a particular phone divided by the number of days the discourse lasted.

Tenor and Tenor variance: I 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). 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). For the emotion category, LIWC maintains a list of 241 positive and 345 negative words. To test its internal validity, six judges rated each of the 74 categories separately and no IRR was found to be below 86%. As a test of LIWC’s external validity, the programmers analyzed 4,578 files of 1,695 subjects and 1.6 million words from 43 studies of writing, speech, and random pages from 30 best sellers. Specifically, the LIWC creators generated 20 studies of 2,028 files of 768 emotional studies analyzing 665,184 words; 15 studies of 1,473 files of 469 non-emotional (control group) studies analyzing 443,668 words; one study of 300 files of 30 best sellers analyzing 200,016 words; and 7 oral/speech studies of 777 files of 428 subjects analyzing 306,439 words.¹ Using the positive and negative tenor results from the LIWC analysis, I then calculated the variance in the tenor to demonstrate uncertainty for market participants; an increase in the variance 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 variance in tenor would be low. This variable was used to test Hypothesis 2.

¹ For more information, please go to www.liwc.net.

Rating: Along with the characteristics of each phone, Phonescoop.com provides an opportunity for users to rate each phone and discuss their experiences. I captured the average of all ratings for each phone and although not specifically included as a formal hypothesis, included the ratings as an additional discourse variable.

Independent variables (Stage 1 – Discourse)

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

Novelty (New to Market): The main predictor variable of interest is how novel each new phone is, which is hypothesized to increase uncertainty and therefore necessitate greater sensemaking by market participants. As mentioned above, although innovation and novelty have been studied in the past, much confusion exists regarding what measures are most appropriate to capture “newness” or novelty and Garcia & Calantone (2002) reviewed the new product development literature and identified 15 constructs and 51 distinct measures. In addition, because I’m using archival data on a large dataset with numerous product categories, I needed to use a measure for novelty that would capture the nuances of the data I had collected and was also easily replicated across several hundred phones.

To do so, I created a new measure of novelty that measures the relative difference of each new phone’s collective characteristics compared to all other previously released phones in the market. I identified 61 product category characteristics (i.e. antenna type, camera resolution, weight, screen size, etc.) from Phonescoop.com, Wireless Week, RCR Wireless, and user manuals. To the extent possible, I kept the data intact as continuous variables but where the data were not continuous, I created categorical variables based on natural groupings in the data. For those characteristics where no natural or logical groupings could be identified, I created dummy variables for having that particular feature or not.

Once the data was organized quantitatively, I calculated a “new to market” novelty score 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, I calculated how many other phones already released in the database had that particular type of feature, which in effect gave me a frequency score for that characteristic. I then took 1 minus that score to arrive at the relative novelty of that phone’s characteristic for that category. Finally, I averaged the novelty scores for each phone across all 61 characteristic categories to arrive at an overall novelty measure that is both quantitative and comparable across all phones in the database.

As an example (see Figure 5 below), “antenna type” has four different forms (internal, external, external extendable, and internal/external) and thus were coded 1-4 in the database, respectively. So if the first “baseline” phone had a value of 1 in that category and the second phone also had a 1, the novelty score would be 0 (since 100% of the phones existing in the database already had that same value). However, if the third phone had a value of 2 in that category, the novelty score would be .67 (3 phones in the database with only 1 having a value of 2 yields a relative frequency of $1/3$ or .33 and $1 - .33 = .67$). If the fourth phone had a value of 3 in the antenna category, its novelty score would be .75 (4 phones in the database with only 1 having a value of 3 yields a relative frequency of $1/4$ or .25 and $1 - .25 = .75$). If the fifth phone had a value of 2 in the antenna category, its novelty score would be .60 (5 phones in the database with only 2 having a value of 2 yields a relative frequency of $2/5$ or .40 and $1 - .40 = .60$). Thus comparing the fifth phone with previous phones shows the next phone to have a value that already exists in the database to be less novel (.6 versus .66 for a phone with that same characteristic and .75 for a phone with a different characteristic), which is

what I was trying to capture. This same process was repeated for all phones in the database and this variable was used to test hypotheses 1, 2, and 6.

Figure 5: Example of “New to Market” novelty measure calculation

Item Number	Antenna type	Relative frequency	Novelty
1	1	N/A	N/A
2	1	1.00	0.00
3	2	0.33	0.67
4	3	0.25	0.75
5	2	0.40	0.60

Other novelty measures. The above discussion presents a novelty measure that represents what is new to the market as a whole since it incorporates comparisons with all phones in the database. However, other measures of novelty can also be used to capture “newness” or relative novelty based on the data I collected. Therefore, for robustness, I also calculated the following measures of novelty.

New to Firm. Prior research on innovation has also distinguished between products that incorporate innovations that are either new to the market in general or just new to the firm, meaning the characteristic may have already existed in the marketplace but the focal firm has incorporated it into its products for the first time (Garcia & Calantone, 2002). To capture this, I followed the same procedures for the “new to market” variable described above but did this for each of the six major wireless carriers individually, meaning the comparison group of relative novelty was not the market as a whole but only the phones previously released by the focal firm.

Total new categories. For phones that created a new characteristic category, (i.e. are the first phone in the database to have a particular feature), I entered a value of one and then added up these values to arrive at a total number of new categories created by a particular new phone.

These phones are generally more innovative as they are the first to have a particular feature the market has not seen before. However, only a small percentage of phones in the database were actually “category creators” so the number of zeroes was high with this measure.

New category dummy. I calculated this variable similar to the new category variable above, but instead of counting all the new categories created by the focal phone I simply made a dummy variable that took the value of 1 if the phone created any new categories and 0 if it did not. This also produced a large number of zeroes as only a small percentage of phones created new categories.

Total changes within category. Less radical innovations also exist in the database as changes to phone features occurred within existing categories (e.g. the evolution of camera resolution from 1-megapixels to 2-megapixels). Whenever a change in the data occurred for the first time (to continue the example from above, this would entail going from an antenna value of “1” to an antenna value of “2” for the first time), I entered a value of one and then added up these values to arrive at a total number of changes within an existing category for each phone.

Category changes dummy. I calculated this variable similar to the change within category variable above, but instead of counting all the changes within existing categories I simply made a dummy variable that took the value of 1 if the phone was the first to have a value in an existing category and 0 if it did not.

To explore the relationship between these various potential measures of novelty, I attempted to conduct a factor analysis in STATA. However, I was unable to use factor analysis to examine this relationship because of the combination of categorical and continuous variables. Specifically, I calculated the Kaiser-Meyer-Olkin (KMO) measure of sampling accuracy, which has a value from 0 to 1 and small values indicate the variables in general have too little in

common to warrant a factor analysis. The overall KMO value for the six measures of novelty was .52, which according to common convention would classify the measures in the “miserable” category for factor analysis. As such, factor analysis was deemed to not be appropriate and an examination of the correlation tables indicated the variables for the most part are not correlated, except the variables measuring similar attributes (i.e. new to market and new to firm are significantly correlated, the new category creation variables are highly correlated, and the within category changes variables are also correlated, but the different classes are not). However, I was interested in exploring the individual effects of these variables on discourse and so conducted robustness checks with each novelty measure as the independent variable. Results were consistent across the measures with a 78% rate of agreement². For presentation purposes, I included only the new to market novelty measure in the table below. See discussion of the results below and tables with results for the additional measures of novelty in the appendix.

Reputation: Following prior research, I obtained data on a firm’s reputation 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, Pollock, & Rindova, Forthcoming; 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;

² For Hypothesis 1, three variables of interest (duration, volume, and frequency) were studied and across the six measures of novelty, a total of 18 models were run. Results for each of the novelty measures were consistent for 14 of the models, resulting in an overall rate of agreement of 78%. The frequency of discourse was significant only for the new to market and new to firm novelty measures.

quality of management; social responsibility to the community and the environment; wise use of corporate assets; financial soundness; and long-term investment value. 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 and were used to test Hypothesis 3. To check for robustness, I also lagged the reputation variable by one year and found largely similar results.

Competitive intensity: Because other new phone introductions would compete with market attention for the focal new product, I counted the number of other phones released in the market during the same calendar year. This variable therefore demonstrates the other “noise” that existed when a new phone was introduced and also represents other bases of comparison, which should influence the discursive sensemaking process as argued in Hypothesis 4. Other indicators of competitive activity, including the relative size of other rival firms and their market share, were included as control variables, which are described in the next section.

Control variables

Several control variables were also used to help rule out alternative hypotheses for the expected results. 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; as such, *Multiple carrier dummy* takes a value of 1 if the phone has more than one carrier and is otherwise a 0. *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. *Herfindahl Index* has been used in prior research to indicate the

level of competitive concentration in a given industry and is calculated as the sum of the squared market shares for the firms in that industry. Using the FCC's annual competition reports, I calculated the Herfindahl index for each year examined and assigned that year's number to each phone introduced in that year. Finally, *Initial Price* is an indicator of the quality of each phone, which could also account for the level of discourse and subsequent performance. Price was collected at the same time as discourse and comes from reading the first few articles introducing the phone and was calculated without a discount for entering into a long-term service agreement with the carrier.

Dependent variable (Stage 2 – Performance)

For Stage 2, I was interested in examining how discourse impacts performance. Traditionally, researchers interested in studying performance have looked at firm-level variables, such as revenues, profits, return on assets, etc. However, in this dissertation, I have examined competition and entrepreneurship at the product level rather than solely at the firm level. As such, commonly used measures of firm performance would not match the level of analysis. Therefore, I measured performance at the phone level as the total sales for a subset of phones in the database. Unfortunately, handset-level sales are not publicly available as the wireless carriers do not publish these data. The NPD Group, Inc. is an independent market research firm that gathers information pertinent to the wireless telephone industry. On a monthly basis, NPD collects more than 150,000 completed surveys of individuals who own cell phones and asks them questions regarding the type of phone they own, the place they purchased it, the price of the phone, the service provider they chose, etc. I purchased these data at a discounted rate but was only able to obtain sales at the handset level from April, 2005 to December, 2008. Still, this study is the first to my knowledge to examine the direct effects of discourse and sales, thereby

allowing me to make both a theoretical and empirical contribution to the examination of the role of market discourse on the market process. The unit of analysis in this stage is at the phone-month level, meaning discourse and sales for each phone were analyzed on a monthly basis.

Independent variable (Stage 2 – Performance)

Because I have moved to a more fine-grained (i.e. monthly) level of analysis, all the discourse variables from Stage 1 could not be used for this portion of the analysis. One of the most prevalent alternative hypotheses is that sales influence discourse rather than discourse affecting sales; as such, much care was taken to attempt to remove this explanation. Using “total” variables such as duration (total amount of time discourse occurred) or volume (total number of articles mentioning the focal phone) would not be effective, as the discourse is occurring at the same time as the sales, which does not remove the question of endogeneity. I therefore transformed the “volume” variable used in Stage 1 and calculated the number of articles per month to match the level of analysis with the sales data. To aid with the analysis, I lagged the predictor variables to rule out reverse causality (Kenny, 1979). For consistency, I used the same control variables in Stage 2 that I used in Stage 1 but also included a lagged sales variable (lagged dependent variable) as well as novelty (*new to market*) as additional controls.

See Table 3 for a summary of all the measures used in the primary analyses for hypotheses testing in both stages.

Table 3: Summary of Study Measures

Entrepreneurial action characteristics (novelty)					
Name	Description	Measure	Source	Tested	Reference
New to Market	How novel the entrepreneurial action is relative to others	1 minus relative frequency of action characteristic in database	- Phonescoop - Factiva - RCR Wireless - Wireless Week	H1, H2, H6	
Firm					
Reputation	Opinion of firm by market experts	Continuous variable based on Fortune magazine criteria for firm reputation	Fortune magazine's "Most Admired Companies" list in telecommunications industry	H3	Pfarrer, Rindova, & Pollock; Basdeo et al. (2006)
Industry conditions					
Competitive intensity	Level of competitive activity in industry	- Herfindahl Index - # of new products per year by service provider	- FCC Competition reports - FCC New product database	H4	Derfus et al. (2008); Eisenhardt (1989)
Discourse					
Duration	How long discourse lasts related to an entrepreneurial action	Last article less first article (days)	Factiva	H1, H3, and H4	
Volume	How much discourse exists related to an entrepreneurial action	Total number of articles referencing new phone	Factiva	H1, H3, and H4	Rosa et al. (1999); Fiss & Hirsh (2005); Kennedy (2005; 2008)
Frequency	How often discourse occurs related to an entrepreneurial action	Number of articles per day during discourse period	Factiva	H1, H3, and H4	
Tenor	Positive or negative tone of discourse related to an entrepreneurial action	LIWC analysis for tenor of discourse	Factiva	Not hypothesized	Pollock & Rindova, 2003
Tenor variance	Variance of positive or negative tone	Variance of LWIC analysis	Factiva	H2	
Ratings	Numerical ratings by users of new phones	Overall satisfaction rating on a scale from 1 to 5 (5 being highest)	Phonescoop	Not hypothesized	
Articles per month	How much discourse exists on a monthly basis related to an entrepreneurial action	Number of articles referencing new phone per month	Factiva	H5 and H6	
Performance					
Sales per month	How many phones were sold per month	Number of phones sold per month at the individual handset level	Phonescoop	H5 and H6	
Controls					
Multiple carrier dummy	Whether or not a phone had more than one service provider	Value of 0 if only one service provider; value of 1 if more than one service provider	- Phonescoop - Factiva - RCR Wireless - Wireless Week	Not hypothesized	
Subscribers	Number of subscribers	Total number of subscribers per year by service provider	FCC Competition Reports	Not hypothesized	
Initial price	First reported price of new phone	First reported price of new phone without phone discount for contract	- Phonescoop - Factiva - RCR Wireless - Wireless Week	Not hypothesized	
Manufacturer dummy	Dummy for each manufacturer of phones	Value of 0 for all manufacturers other than manufacturer of focal phone	- Phonescoop - Factiva - RCR Wireless - Wireless Week	Not hypothesized	

Chapter 5: Results

Analytical procedures

The main database for my analysis is the new phones approved by the FCC for introduction into the United States market from 1998 to 2007. I ordered them chronologically by FCC approval date, thereby allowing me to capture and investigate the evolution of innovation across the time of my study. The unit of analysis is essentially at the phone level, but these phones are embedded with the carriers that introduce them. To help control for unobserved firm heterogeneity, I organized the data as an unbalanced panel with firm-fixed effects. I used STATA software version 10 to run statistical analyses using generalized least squared (GLS). I also standardized all variables before running the analyses to aid in interpretation of the coefficients. I ran skewness and kurtosis tests in Stata on the dependent variables and the results indicated I cannot reject the null hypothesis that the sample distribution is normally distributed, meaning the sample appears to have a normal distribution. As such, models assuming normality were used for the analysis.

Descriptive statistics and correlations

Table 4 showcases the descriptive statistics and correlations for the Stage 1 variables and Table 5 presents the descriptive statistics and correlations for the Stage 2 analysis. Stars next to the numbers indicate significance at the .05 level.

Table 4: Descriptive Statistics and Correlations – Stage 1

Descriptive statistics and correlations for Stage 1 variables

Variable	Obs	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1 New to Market	385	0.31	0.06	0.07	0.45	1																				
2 New to Firm	385	0.28	0.07	0.07	0.48	0.9349*	1																			
3 Total New Categories	385	0.07	0.35	0	3	-0.1419*	-0.1665*	1																		
4 Total New Categories Dummy	385	0.05	0.22	0	1	-0.1732*	-0.1940*	0.8799*	1																	
5 Total Changes in Category	385	0.08	0.30	0	2	-0.0908	-0.099	0.0951	0.0903	1																
6 Total Changes in Category Dummy	385	0.07	0.25	0	1	-0.1206*	-0.1212*	0.1236*	0.1298*	0.9514*	1															
7 Duration	385	884.86	583.16	13	2803	-0.1345*	-0.0952	0.2100*	0.2452*	0.0911	0.1053*	1														
8 Volume	385	71.86	125.24	2	1132	0.2381*	0.2791*	0.1018*	0.1157*	0.055	0.0657	0.4424*	1													
9 Frequency	385	0.07	0.09	0.01	0.65	0.3366*	0.2794*	0.0213	0.0121	0.0049	0.008	0.1096*	0.8452*	1												
10 Tenor Var	385	1.83	0.91	1.01	6.99	0.2275*	0.2491*	-0.1102*	-0.1058*	-0.027	-0.0408	-0.0665	0.0662	0.1653*	1											
11 Positive	385	2.44	0.46	1.14	5.26	0.2334*	0.2522*	-0.0954	-0.0574	-0.0247	-0.0287	0.0438	0.1891*	0.2369*	0.8754*	1										
12 Negative	383	3.58	0.20	0.07	1.81	-0.0346	-0.0483	0.0056	0.088	-0.0345	-0.019	0.1485*	0.1170*	0.0687*	-0.1653*	0.2205*	1									
13 Rating	385	0.44	0.50	0	1	0.1481*	0.1183*	0.0432	0.043	-0.0191	0.0232	0.0175	0.1238*	0.1351*	0.0696	0.1079*	0.0317	1								
14 Multiple Carrier Dummy	385	6.11	0.98	4.11	7.83	0.2272*	0.2114*	-0.0027	0.0388	-0.0214	-0.0309	0.2061*	0.1816*	0.1183*	0.0285	0.0714	0.0386	-0.0417	1							
15 Reputation	385	41576.55	17638.12	4103	71317	0.3304*	0.3857*	-0.1113*	-0.1182*	-0.032	-0.0403	-0.1400*	-0.0253	0.0296	0.0605	0.0223	-0.0689	0.0714	0.0025	1						
16 Subscribers	385	0.18	0.03	0.14	0.21	0.5426*	0.5223*	-0.1385*	-0.1813*	-0.1115*	-0.1238*	-0.4068*	-0.0282	0.1837*	0.1590*	0.1328*	-0.0319	0.1224*	0.0487	-0.0156	0.4068*	1				
17 Herfindahl Index	385	138.77	35.06	6	181	0.6917*	0.6215*	-0.3098*	-0.3461*	-0.1531*	-0.1638*	-0.1910*	0.0406	0.097	0.1625*	0.1552*	-0.0428	0.0142	-0.0797	0.3012*	0.3582*	0.1931*	1			
18 New Products per Year	385	209.76	144.47	10	749	0.0906	0.1156*	0.1181*	0.0987	0.0399	0.0549	0.3685*	0.2628*	0.1947*	0.0095	0.0522	0.0608	0.082	0.0082	-0.0949	-0.0296	-0.2330*	-0.0214	1		
19 Initial Price	385	16.21	5.90	1	27	0.1051*	0.0972	-0.0914	-0.0974	0.0143	0.0064	-0.1142*	-0.0038	0.0212	0.0829	0.0639	-0.0396	0.0715	-0.1348*	0.0653	0.0691	-0.0574	-0.0214	0.0037	1	
20 Manufacturer Dummy	385	16.21	5.90	1	27	0.1051*	0.0972	-0.0914	-0.0974	0.0143	0.0064	-0.1142*	-0.0038	0.0212	0.0829	0.0639	-0.0396	0.0715	-0.1348*	0.0653	0.0691	-0.0574	-0.0214	0.0037	1	

Table 5: Descriptive Statistics and Correlations – Stage 2

Variable	Obs	Mean	Std. Dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1 Sales per Month	15300	10820.91	36853.30	0	734255	1																	
2 Lagged Sales per Month (1)	14960	10852.40	35837.82	0	734255	0.8800*	1.00																
3 Articles per Month	15300	0.88	3.84	0	99	0.1417*	0.1240*	1.00															
4 Lagged Articles per Month (1)	15300	0.89	3.85	0	99	0.1664*	0.1390*	0.6931*	1														
5 Lagged Articles per Month (2)	15300	0.90	3.86	0	99	0.1681*	0.1637*	0.6096*	0.6935*	1													
6 Lagged Articles per Month (3)	15300	0.90	3.87	0	99	0.1621*	0.1676*	0.5252*	0.6081*	0.6919*	1												
7 Lagged Articles per Month (4)	15300	0.91	3.91	0	99	0.1577*	0.1598*	0.4760*	0.5242*	0.6029*	0.6869*	1											
8 Lagged Articles per Month (5)	15300	0.92	3.93	0	99	0.1567*	0.1542*	0.4266*	0.4740*	0.5225*	0.6013*	0.6837*	1										
9 Lagged Articles per Month (6)	15300	0.93	3.94	0	99	0.1470*	0.1546*	0.3836*	0.4274*	0.4730*	0.5212*	0.6018*	0.6840*	1									
10 New to Market	15300	0.32	0.05	0.12	0.42	0.1027*	0.1015*	0.1728*	0.1722*	0.1718*	0.1713*	0.1695*	0.1680*	0.1665*	1								
11 Multiple Carrier Dummy	15300	0.48	0.50	0	1	0.0816*	0.0842*	0.0199*	0.0213*	0.0213*	0.0212*	0.0218*	0.0235*	0.0257*	-0.1605*	1							
12 Reputation	15300	6.20	0.97	4.11	7.83	0.1267*	0.1286*	0.0640*	0.0616*	0.0612*	0.0592*	0.0538*	0.0503*	0.0475*	0.2216*	-0.0141	1						
13 Subscribers	15300	42668.14	17352.20	4103	71317	0.0788*	0.0765*	0.1224*	0.1210*	0.1200*	0.1191*	0.1172*	0.1150*	0.1134*	0.3927*	-0.0883*	0.4167*	1					
14 Herfindahl Index	15300	0.18	0.03	0.14	0.21	0.1546*	0.1528*	0.1456*	0.1416*	0.1386*	0.1350*	0.1283*	0.1230*	0.1163*	0.5477*	-0.1659*	0.2754*	0.3760*	1				
15 New Products per Year	15300	143.15	29.57	20	181	0.0396*	0.0400*	0.0346*	0.0386*	0.0415*	0.0449*	0.0488*	0.0531*	0.0565*	0.5980*	-0.0073	0.1148*	0.2016*	0.1212*	1			
16 Initial Price	15300	205.12	145.38	10	800	-0.0683*	-0.0680*	0.0596*	0.0621*	0.0637*	0.0658*	0.0681*	0.0710*	0.0744*	0.0856*	0.0356*	-0.0729*	0.0032	-0.2475*	-0.0114	1		
17 Manufacturer Dummy	15300	16.66	5.46	1	27	-0.0781*	-0.0779*	-0.0044	-0.0046	-0.0047	-0.0049	-0.0044	-0.0051	-0.0055	0.0424*	-0.2064*	-0.1590*	0.0537*	0.0343*	-0.0189*	0.0664*	1	

Results

Stage 1 Results

Table 6 shows the results from the first stage of analysis in which various aspects of discourse were used as the dependent variable. Hypothesis 1 argued the more novel a phone is the more intense the discourse would be to help market participants reduce uncertainty caused by this new product. The intensity of discourse was measured using duration, volume, and frequency of discourse, which are represented by Columns 1, 2, and 3 using “New to Market” as the independent variable. The results indicate support for this hypothesis, as novelty is positively and significantly related to discourse intensity ($b=.149$, $p<.01$; $b=.761$, $p<.01$; and $b=.097$, $p<.01$, respectively). Thus the more novel a phone is, longer discourse lasts, the more discourse is necessary, and the more often the phone is discussed, all which help market participants make sense of the new phone.

For robustness, I also conducted the analysis using the five other measures for novelty previously discussed, namely *new to firm*, *total new categories*, *new category dummy*, *total changes within category*, and *category changes dummy*. The results were largely consistent with the new to market measure, thus helping to validate the *new to market* measure and offering further support of Hypothesis 1. In particular, the *new to firm* measure of novelty reproduced the results using the *new to market* measure showing a significant and positive effect between novelty and duration, volume, and frequency. The other four novelty measures demonstrated significant and positive effects between novelty and duration and volume, but frequency was not significant. See the appendix for results from robustness tests.

As a post hoc analysis, I entered a squared term for the new to marker measure of novelty. One could argue that as a new phone departs too much from existing products, the market may

not even attempt to make sense of the product (Hargadon & Douglas, 2002) and therefore a reduction in discourse would result. However, the novelty squared term was not significant with any dependent variables measuring discourse.

Hypothesis 2 stated the uncertainty caused by more novel phones would also be manifested by an increase in conflict, measured by the variance in positive and negative tenor of discourse. Column 4 shows no support for this hypothesis, as the variance in tenor is not significant ($b=.079$, $p=n.s.$).

Hypothesis 3 argued for the substitutive effect of reputation of the intensity of discourse as a sensemaking mechanism. This hypothesis was predominantly supported, as reputation had a negative and significant effect on the duration ($b=-.013$, $p<.01$) and volume ($b=-.10$, $p<.01$) of discourse. However, the relationship between reputation and discourse frequency was not significant ($b=-.016$, $p=n.s.$). In addition, reputation was significantly and negatively related to the negative tenor of discourse, which was not hypothesized but is logically consistent with prior reputation and tenor research (e.g. Pollock & Rindova, 2003). It seems a higher firm reputation not only reduces the duration and volume of discourse used as sensemaking but also helps to reduce the negative things written about the new product introduced by the firm.

Hypothesis 4 stated the competitive intensity would also act as a substitute for discourse as new products introduced in the same timeframe as the focal phone would compete for the attention of the market but would also help market participants categorize the new phone. The results indicate this hypothesis was also supported, as the number of new products is negatively and significantly related to duration ($b=-.153$, $p<.01$), volume ($b=-.371$, $p<.01$), and frequency ($b=-.050$, $p<.01$) of discourse. This suggests as other new phones are introduced, the market participants do not need discourse on any one particular phone to help them make sense of the

new phone but that other phones can have an uncertainty-reducing effect. Also, the number of new products was significantly and negatively related to the ratings of each product, suggesting when the market has other options to choose from and to compare the focal phone to, the less it values each new phone.

Table 6: Hypothesis Testing – Stage 1

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
	DV: Duration	DV: Volume	DV: Frequency	DV: Tenor Var	DV: Positive	DV: Negative	DV: Rating
New to Market	0.149** (0.003)	0.761** (0.010)	0.097** (0.018)	0.079 (0.075)	0.106 (0.069)	-0.026 (0.076)	0.218** (0.079)
Reputation	-0.013** (0.002)	-0.100** (0.008)	-0.016 (0.013)	-0.01 (0.053)	-0.076 (0.048)	-0.118* (0.053)	0.058 (0.056)
Competitive Intensity	-0.153** (0.003)	-0.371** (0.009)	-0.050** (0.015)	0.002 (0.063)	-0.034 (0.058)	-0.037 (0.064)	-0.159* (0.067)
Mult Carrier Dummy	0.132** (0.002)	0.341** (0.006)	0.037** (0.010)	0.064 (0.042)	0.095* (0.039)	0.035 (0.043)	-0.017 (0.045)
Herfindahl Index	-0.291** (0.003)	-0.339** (0.013)	0.006 (0.020)	-0.041 (0.083)	-0.094 (0.076)	-0.059 (0.083)	0.023 (0.087)
Subscribers	0.051** (0.006)	0.280** (0.024)	0.02 (0.035)	0.331* (0.147)	0.413** (0.134)	0.209 (0.148)	-0.009 (0.154)
Price	0.185** (0.002)	0.291** (0.008)	0.042** (0.014)	0.011 (0.060)	0.036 (0.055)	0.053 (0.060)	0.06 (0.063)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y
Constant	0.209 (0.038)	0.062 (0.039)	0.03 (0.078)	-0.009 (0.323)	0.457 (0.295)	0.703* (0.325)	-0.361 (0.341)
Observations	385	385	385	385	385	385	383
Number of Carrier Categories	6	6	6	6	6	6	6
R-squared	0.35	0.21	0.2	0.08	0.1	0.02	0.06

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Stage 2 Results

Table 7 shows the results from the second stage of analysis, in which performance was the dependent variable and discourse measured at the month level was used as the primary independent variable. To help reduce the likelihood of reverse causality, I lagged the independent variable by one month prior to sales, as show in Column 1. To further help reduce reverse causality, I lagged the dependent variable an additional month, which isolates the effect of lagged discourse above and beyond prior sales on discourse and future sales to test Hypothesis 5a, which argued for an effect of discourse on future sales. Results suggest that indeed discourse

referencing a particular phone does have a positive and significant effect on future sales of that phone, which supports Hypothesis 5a ($b=.051, p<.01$). In addition, for robustness, I included a variable that represents a one-month lagged sales amount and found similar results, although the coefficients for all month were higher with two-month sales lag (see appendix for robustness results). Columns 1 through 6 continue to control for lagged sales but increase the lagged time of discourse to test Hypothesis 5b, which argues for a diminishing effect of the relationship between discourse and sales. (Note: I judgmentally stopped the analysis at a 6-month lag because the results were consistent with earlier models.) I conducted analysis of variance (ANOVA) tests between each month of discourse and the previous month of discourse, indicating statistically significant relationships between the months. More specifically, ANOVA results from one-month to two-month discourse lag ($F=4.46, p<.001$), two-month to three-month discourse lag ($F=4.10, p<.001$), three-month to four-month discourse lag ($F=4.54, p<.001$), four-month to five-month discourse lag ($F=3.83, p<.001$), and five-month to six-month discourse lag ($F=3.39, p<.001$) all indicate statistically significant differences from month to month. Further, viewing the coefficients of these months show that the highest impact on the dependent variable of sales comes from a one-month lag that diminishes significantly over time, indicating support for Hypothesis 5b. Comparing the coefficients of the various models do indicate the strongest effects are the first month and that these decline steadily over time, although Column 5 (representing discourse lagged 5 months) does not conform to the decreasing trend even though it is less impactful than the discourse lagged only one month. These results indicate discourse does have a positive and significant effect on sales but that the effects are strongest just before the time of purchase.

Columns 7 through 12 offer additional analyses by including all lagged discourse variables with (Column 8) and without (Column 7) the novelty measure, as well as including more lagged sales variables with (Column 10) and without (Column 9) novelty. Finally, Column 11 includes all lagged discourse variables but holds constant sales lagged two months but doesn't include novelty, whereas Column 12 includes novelty. The results are predominantly consistent across all the models, with discourse just prior to sales the most significantly related to future sales. One particularly interesting result, however, is how discourse becomes negatively statistically significant when lagging 3 months, turns positive again at a 5-month lag, and then becomes negative again at a 6-month lag. I will explore this further in the post hoc analysis section below.

Table 7: Hypothesis Testing – Stage 2

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	
	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	
Lagged Articles per Month (1)	0.051** (0.004)							0.043** (0.008)	0.043** (0.008)	0.040** (0.004)	0.040** (0.004)	0.048** (0.005)	0.047** (0.005)
Lagged Articles per Month (2)		0.041** (0.004)						0.032** (0.009)	0.031** (0.009)	0.005 (0.004)	0.005 (0.004)	0.028** (0.006)	0.028** (0.006)
Lagged Articles per Month (3)			0.021** (0.004)					0.016+ (0.009)	0.015+ (0.009)	-0.020** (0.004)	-0.020** (0.004)	-0.022** (0.006)	-0.022** (0.006)
Lagged Articles per Month (4)				0.018** (0.004)				0.015+ (0.009)	0.015+ (0.009)	0.001 (0.004)	0.001 (0.004)	-0.013* (0.006)	-0.013* (0.006)
Lagged Articles per Month (5)					0.022** (0.004)			0.026** (0.009)	0.026** (0.009)	0.010* (0.004)	0.010* (0.004)	0.012* (0.005)	0.012* (0.005)
Lagged Articles per Month (6)						0.017** (0.004)		0.025** (0.008)	0.025** (0.008)	-0.011** (0.004)	-0.012** (0.004)	(0.003)	(0.003)
Lagged Sales per Month (1)										0.769** (0.009)	0.769** (0.009)		
Lagged Sales per Month (2)	0.770** (0.005)	0.770** (0.005)	0.772** (0.005)	0.773** (0.005)	0.772** (0.005)	0.773** (0.005)				0.044** (0.011)	0.044** (0.011)	0.771** (0.005)	0.771** (0.005)
Lagged Sales per Month (3)										0.092** (0.011)	0.092** (0.011)		
Lagged Sales per Month (4)										0.040** (0.011)	0.040** (0.011)		
Lagged Sales per Month (5)										-0.025* (0.011)	-0.025* (0.011)		
Lagged Sales per Month (6)										-0.031** (0.008)	-0.031** (0.008)		
New to Market	0.014 (0.009)	0.017+ (0.009)	0.022* (0.009)	0.023* (0.009)	0.022* (0.009)	0.023* (0.009)			0.028+ (0.015)			0.012 (0.007)	0.015 (0.009)
New Products	0.013* (0.005)	0.014** (0.005)	0.015** (0.005)	0.015** (0.005)	0.015** (0.005)	0.016** (0.005)	0.023* (0.010)	0.007 (0.013)	-0.008+ (0.005)	-0.015* (0.006)	(0.008)	(0.006)	-0.016* (0.008)
Mult Carrier Dummy	0.018+ (0.011)	0.019+ (0.011)	0.021* (0.011)	0.022* (0.011)	0.021* (0.011)	0.022* (0.011)	0.077** (0.008)	0.078** (0.008)	0.005 (0.004)	0.005 (0.004)	0.012* (0.005)	0.013* (0.005)	
Herfindahl Index	-0.016* (0.008)	-0.018* (0.008)	-0.021** (0.008)	-0.021** (0.008)	-0.021** (0.008)	-0.022** (0.008)	0.125** (0.016)	0.113** (0.017)	0.009 (0.008)	0.004 (0.009)	0.025* (0.010)	0.019+ (0.011)	
Subscribers	0.030+ (0.018)	0.031+ (0.018)	0.032+ (0.018)	0.032+ (0.018)	0.033+ (0.018)	0.033+ (0.018)	0.033+ (0.029)	0.015 (0.029)	0.018 (0.014)	0.031* (0.008)	0.030* (0.014)	0.031+ (0.018)	0.030+ (0.018)
Price	-0.016* (0.007)	-0.015* (0.007)	-0.012+ (0.007)	-0.012+ (0.007)	-0.013+ (0.007)	-0.012+ (0.007)	-0.062** (0.011)	-0.070** (0.011)	(0.005)	(0.008)	-0.012+ (0.007)	-0.015* (0.007)	
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	-0.016** (0.005)	-0.015** (0.005)	-0.012* (0.005)	-0.012* (0.005)	-0.013* (0.005)	-0.012* (0.005)	-0.036** (0.008)	-0.038** (0.008)	-0.009* (0.004)	-0.009* (0.004)	-0.015** (0.005)	-0.016** (0.005)	
Observations	14620	14620	14620	14620	14620	14620	15300	15300	13260	13260	14620	14620	
Number of Carrier Categories	6	6	6	6	6	6	6	6	6	6	6	6	
R-squared	0.64	0.64	0.64	0.64	0.64	0.64	0.06	0.06	0.79	0.79	0.65	0.65	

Standard errors in parentheses

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

Mediation Results

According to Baron and Kenny (1986), in order for full mediation to exist, 4 criteria must be met. First, the independent variable (novelty) must be significantly related to the ultimate outcome variable (sales). Second, the independent variable (novelty) must be significantly related to the mediating variable (lagged discourse). Third, the mediating variable (lagged discourse) must be significantly related to the ultimate outcome variable (sales). Finally, when the independent variable (novelty) and the mediating variable (lagged discourse) are included in

the same regression analysis, the previously significant relationship between the independent variable (novelty) and the outcome variable (sales) must go away while the previously significant relationship between the mediating variable (lagged discourse) and the outcome variable (sales) must hold.

Table 8 shows the results from the mediation testing that bridges the Stage 1 and Stage 2 analyses, which indicates discourse fully mediates the relationship between novelty and sales. Column 1 indicates a significant relationship between novelty and sales ($b=.027$, $p<.01$), Column 2 shows a significant relationship between novelty and lagged discourse ($b=.240$, $p<.01$), Column 3 presents a significant relationship between lagged discourse and sales ($b=.051$, $p<.01$), and Column 4 shows the relationship between novelty and sales going away ($b=.014$, $p=n.s.$) while the relationship between lagged discourse and sales holds ($b=.051$, $p<.01$). Again, for robustness, I included a variable that represents a one-month lagged sales amount and found similar results (see appendix for robustness results).

Table 8: Mediation Testing

	Column 1 DV: Sales/Month	Column 2 DV: Articles/Month	Column 3 DV: Sales/Month	Column 4 DV: Sales/Month
New to Market	0.027** (0.009)	0.240** (0.020)		0.014 (0.009)
Lagged Articles per Month (1)			0.051** (0.004)	0.051** (0.004)
Lagged Sales per Month (2)	0.776** (0.005)	0.132** (0.011)	0.770** (0.005)	0.770** (0.005)
New Products	-0.023** (0.008)	-0.133** (0.017)	(0.008) (0.006)	-0.016* (0.008)
Mult Carrier Dummy	0.016** (0.005)	0.067** (0.011)	0.012* (0.005)	0.013* (0.005)
Herfindahl Index	0.023* (0.011)	0.094** (0.023)	0.025* (0.010)	0.018+ (0.011)
Subscribers	0.033+ (0.018)	0.056 (0.039)	0.031+ (0.018)	0.030+ (0.018)
Price	(0.010) (0.007)	0.117** (0.015)	-0.012+ (0.007)	-0.016* (0.007)
Manufac Dummy	Y	Y	Y	Y
Constant	-0.009+ (0.005)	0.133** (0.011)	-0.015** (0.005)	-0.016** (0.005)
Observations	14663	15300	14620	14620
Number of Carrier Categories	6	6	6	6
R-squared	0.64	0.05	0.64	0.64

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Post Hoc Analysis – Discourse over Time

In this dissertation, the market process – with discourse as a central element – is conceptualized as an interactive, dynamic, longitudinal, non-linear phenomenon. As such, time is an important element whose relationship to the market process is examined in this next section. Findings during my initial analysis showed how discourse can actually impact performance in different ways depending on what time period is examined. Although I do not specifically test discourse with respect to performance in this exploratory section, I do empirically examine what discourse may look like as the market process unfolds. I explore how a main element of

entrepreneurial action explored throughout this dissertation – namely novelty – influences these stages of discourse.

As an empirical exploration into the validity of the process described above and to preliminarily test the non-linear nature of discourse, Growth Curve Modeling techniques were employed in HLM. The discourse data was organized similar to Stage 2 above (performance outcomes and mediation), using the number of articles per month as the primary variable of interest. Because the area of interest is analyzing how discourse is shaped over time, the data were rearranged to match up the timing of discourse of all phones, meaning the first month of discourse for each phone was compared across the data, regardless of the actual calendar month it was introduced. In other words, a phone whose first month of discourse was March, 2002 was compared to another phone whose first month of discourse was in October, 2006 so the entire curve of both phones could be compared on average.

Using time as the level 1 variable, the number of articles per month was regressed on time and analyzed with an intercept as well as a linear and a squared term of time. See Table 9 for descriptive statistics and correlations between the variables. Results showed a significant difference between the three terms, as the linear relationship between time and discourse is positive and significant and the curvilinear relationship between time and discourse is negative and significant (see Step 1 in Table 10 below). The intercept, here measured as the first month of discourse, was positively and significantly related to time ($b=7.97$, $p<.001$). Next, with time as a linear term, discourse was found to be positively and significantly different than the intercept ($b=.29$, $p<.05$). Finally, time was squared and the results showed discourse is negatively and significantly different than time as a linear term ($b=-.11$, $p<.001$). That is, the relationship between time and discourse showed a positive, or upward, trend in the earlier time

periods and a negative, or downward, trend in the later time periods. These results suggest that discourse is indeed a complex and dynamic construct that can change over time. See Figure 6 for a graphical representation of discourse over time.

Table 9: Descriptive Statistics and Correlations

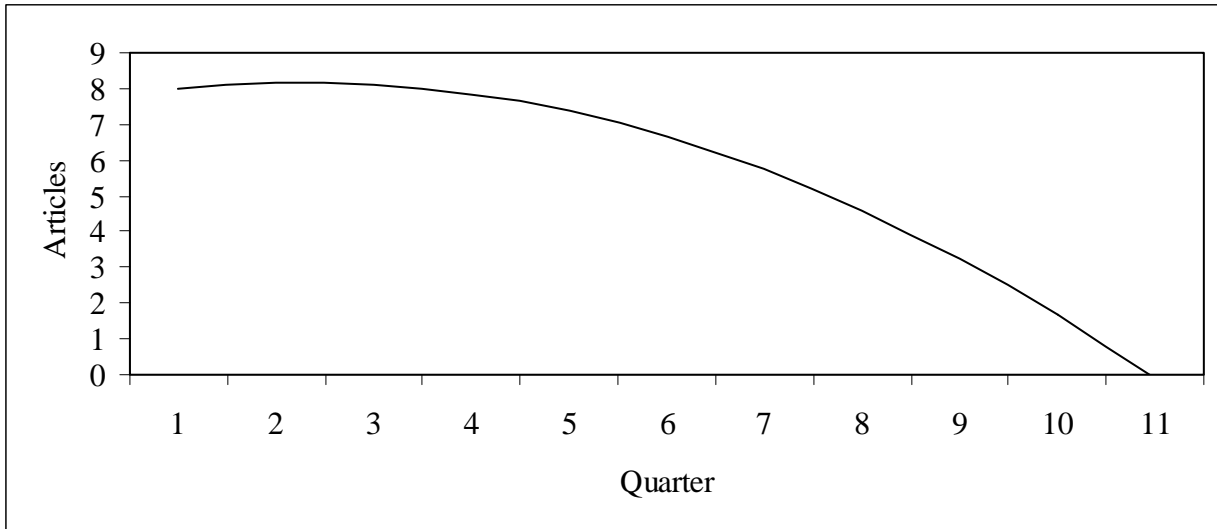
Variables	N	Mean	SD	Min	Max	Discourse	Time	Time ²	Novelty
Discourse	10021	5.67	15.82	0	350	1			
Time (Quarterly)	10021	5	3.16	0	10	-0.16	1		
Time ²	10021	35	32.83	0	100	-0.17	.96**	1	
Novelty	911	0.32	0.05	0.07	0.48	0.12	0.00	0.00	1

Table 10: Results from HLM Analysis

	Discourse (Articles per Month)		
	b	s.e.	t
Step 1			
Intercept	7.97**	0.52	15.45
Time	.29*	0.12	2.38
Time ²	-0.11**	0.01	-9.33
R ²			0.01
Step 2			
Novelty	42.85**	9.38	4.57
R ²			0.03
Step 3			
Novelty*Time	4.73*	2.23	2.12
Novelty*Time ²	-.89**	0.21	-4.28
R ²			0.45

The changes in R² values indicate the percentage of explainable level 1 and 2 variance in the dependent variable accounted for by each step.
 * significant at 5%; ** significant at 1%

Figure 6: Discourse over Time

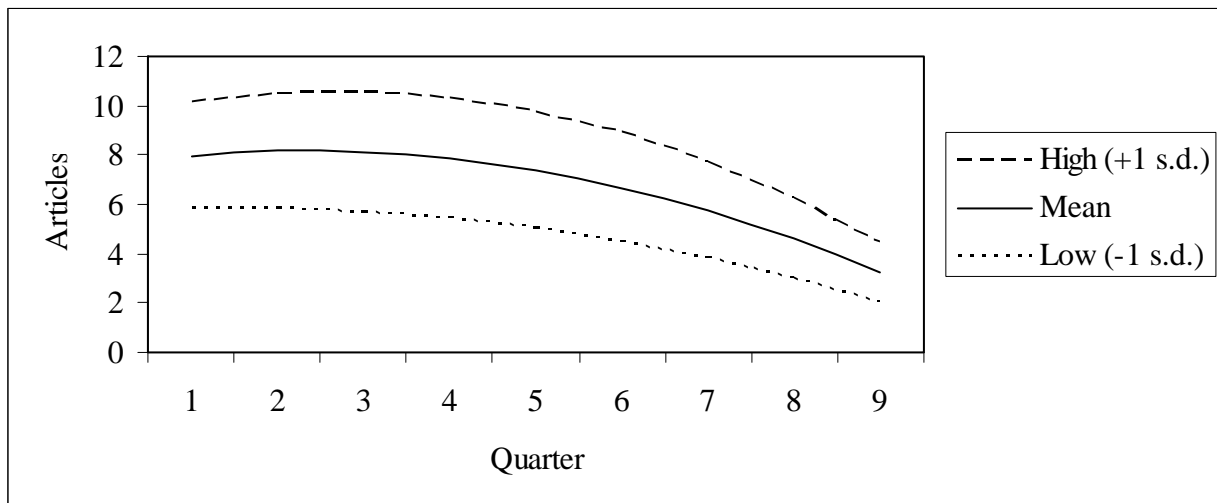


For further analysis and consistent with relationships explored earlier in this dissertation, novelty was used as a moderating level 2 variable in HLM to examine its effect on discourse over time (see Step 2 in Table 11 above). This analysis is in line with the graphing method outlined by Aiken and West (1991) for interpreting interactions in the presence of curvilinear relationships. First, comparing the level 1 and level 2 models indicated a significant difference, ($\chi^2 = 8129.68, p < .001$), indicating phone-level differences do exist in novelty (not presented). Next, the main effect of novelty was positive and significant as the initial intercept ($b = 42.85, p < .001$) increased compared to the level 1 discourse variable. Further, as seen in Step 3 of Table 11 above, novelty had a positive and significant effect as a cross-level moderator on time as a linear construct ($b = 4.73, p < .05$). Finally, novelty was also negatively and significantly related to the squared time term ($b = -.89, p < .001$). Results suggest that the relationship between discourse and time was accentuated when phone novelty was considered as part of the model.

Figure 7 depicts the interaction between phone-level novelty and both time and time-squared plus and minus one standard deviation (Aiken & West, 1991). An examination of this

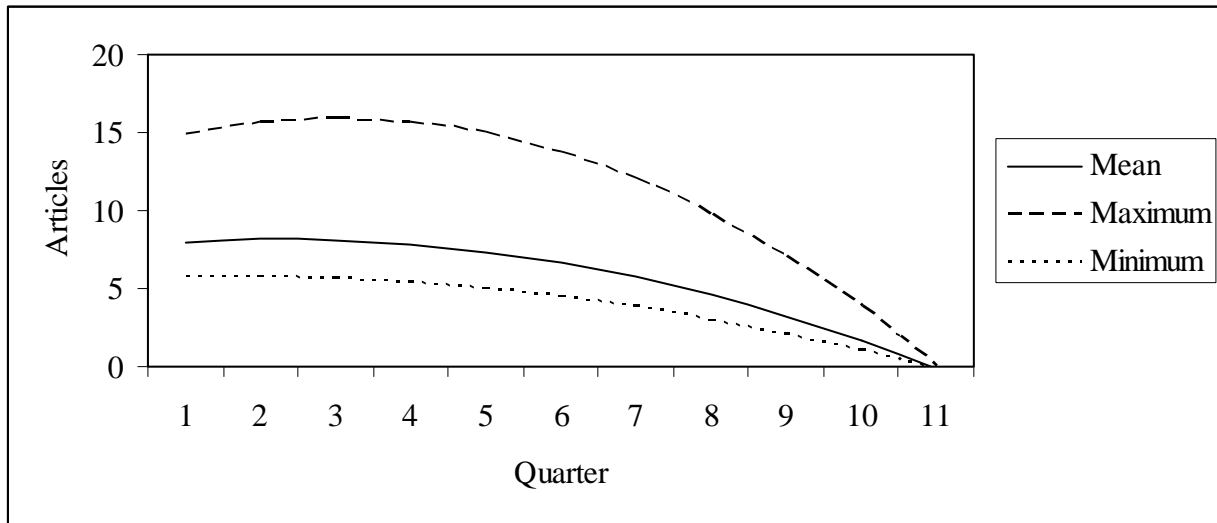
graph shows that on average, the discourse of cell phones with a greater level of novelty was initially higher than other phones at around 10 articles in the first month. In addition, the discourse of highly novel phones typically peaked in the 3rd quarter. Further, the level of discourse for highly novel phones was higher than that of other phones in all periods. In comparison, the discourse of phones with a lower novelty level typically started at less than 6 articles. The highest number of articles for these phones was in the first month and then the discourse decreased rapidly over time.

Figure 7: High and Low Novelty and Discourse over Time



These findings indicate novelty accentuates the findings with discourse and time and – similar to the regression results obtained above – significantly impact the level of discourse that occurs after a new product introduction. To further accentuate the difference between highly novel phones and less novel phones, Figure 8 presents the phones with the maximum and minimum score of novelty. The curves on the graphs are similar to other graphs above, but the difference is easier to see.

Figure 8: Max and Min Novelty and Discourse over Time



Chapter 6: Discussion

Results at least partially supported five of the six hypotheses, with novelty being significantly and positively related to the intensity of market discourse, meaning the more novel a new phone was, the more, the longer, and the more frequently discourse occurred to help market participants make sense of the new product. However, novelty did not seem to significantly influence the level of conflict in the market, but reputation and competitive intensity were each significantly and negatively related to the intensity of discourse as the market was able to use other key informational cues as a sensemaking mechanism to help reduce uncertainty of a new product. Finally, discourse was significantly related to sales and discourse fully mediated the relationship between novelty and sales, indicating that discourse is an important construct to study when exploring new product introductions and their impact on performance.

The initial hypothesis examined how novelty would impact the duration, volume, and frequency of discourse, which combined are an indicator of the intensity of market discourse. As new products are introduced, they infuse new information into the market, which subsequently causes uncertainty for market participants. In order to reduce this uncertainty, market participants seek information contained in 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 in the sensemaking and overall market process has been applied in a limited way in the past. 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 and can shed light on how discourse can help new products become accepted or rejected by the market.

The second hypothesis further explored the content of market discourse and focused on the conflict that results from the uncertainty caused by market discourse. As market participants attempt to process the uncertainty introduced by new products, various interpretations are possible, which leads to conflict of opinion in the market place. The higher the level of novelty the new product is, the higher the likelihood of numerous interpretations, which will then lead to higher conflict between market participants. Although this hypothesis was not supported, conflict in the market is an important concept to explore, especially in relation to new product introductions and market opinion.

Further analysis highlighted how firm reputation impacts the market's sensemaking process following a new product introduction. When new products are introduced, the introducing firm's reputation is a primary factor in the eventual acceptance or rejection of the new product. Prior research on media attention would predict the higher the reputation of the firm, the more media coverage would result (e.g. Rindova et al., 2006). However, from a sensemaking perspective, the opposite prediction was made, as firm reputation acted as a key signal of information about the new product, thus reducing uncertainty and the subsequent need for market participants to engage in market discourse as a sensemaking mechanism. In this way, a firm's reputation was a substitute for market discourse and was found to significantly reduce the duration and volume of discourse. In addition, reputation also significantly reduced the negative tenor of discourse regarding a new product, highlighting how reputation helps to further reduce the unpleasant and perhaps undesired side effects of new product introductions.

This finding for a negative relationship between firm reputation and 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. I

intentionally captured discourse 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 in the market discourse that results from those actions.

Although the dependent variables were different than prior studies, the reputation variable used was consistent with extant research and exhibited similar characteristics. For example, reputation was highly correlated with the number of subscribers (.41 in Stage 1 and .42 in Stage 2, both significant), which is a proxy for firm size. In addition, the fact that the negative tenor was reduced by a more positive firm reputation is consistent with what would be predicted by prior research (e.g. Pollock & Rindova, 2003). Therefore, it appears that empirically reputation was studied consistently with extant research but that viewed from a sensemaking rather than a media attention perspective, reputation was predicted and found to reduce the intensity of discourse specific to new product introductions.

Similarly, the competitive intensity of the industry was also found to reduce the uncertainty and intensity of market discourse following a new product introduction. As a single new product is introduced, it will garner the attention of the media but will also be difficult for the market to categorize in line with existing products. However, as more new products are introduced – both by the focal firm as well as by competitors – the media's attention will be

spread to cover more products, thereby reducing the amount of coverage for each individual product. More importantly, the market will also have more products with which to compare each new product with that will aid market participants categorize and make sense of the new product. Although competition can be viewed as hurting the profitability of new products, however, viewed in this way competition can actually benefit the acceptance of new products by helping market participants make sense of them.

Next, the impact of discourse on sales of new products was examined, where an increase of discourse was hypothesized to positively influence sales, although these effects were expected to diminish over time. The results confirmed both hypotheses as discourse was significantly and positively related to subsequent sales but whose effects diminished over time. Importantly, these effects were found controlling for prior period sales, which helps to remove the alternative hypothesis that higher sales lead to more market discourse rather than the other way around. In addition, the impact of discourse on performance was also found controlling for the novelty of the new product, which highlights the independent effect discourse can have on the acceptance of new products.

To further explore the impact of novelty and discourse on performance, mediation analysis was conducted. As mentioned above, discourse was found to be positively and significantly related to sales. In addition, novelty was found to be positively and significantly related to both discourse and sales. However, this relationship vanished once discourse was entered into the model, signifying the full mediating role of discourse between new product novelty and sales. This finding highlights the important role of market discourse in the diffusion of new products and accentuates the value of studying discourse as a key mechanism in the market process.

Although preliminary, the results suggest that discourse is a complex, multi-dimensional construct that is impacted by various characteristics and the product, firm, and industry levels. In particular, although discourse is an important sensemaking mechanism for market participants to help reduce uncertainty, contextual factors such as firm reputation and the competitive actions and reactions of rivals 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.

As a further exploration into the time variant nature of discourse, perhaps prior research on the diffusion of innovations can be combined with the empirical results found in this dissertation. Discourse has been found to demonstrate dynamic, non-linear properties, which are consistent with Rogers' (1995) conceptualization of how innovations are diffused and accepted in the market. In line with this research, I argue that discourse following an entrepreneurial action experiences four distinct stages that reflect the market's reaction to this action. Rogers (1995) argued for four main categories for adopters of innovations: innovator/early adopters, early majority, late majority, and laggards. Accordingly, I see four main stages of discourse that vary based on the nature of the discourse, the volume of discourse, and who is most likely to participate in the discourse. The four main stages of discourse are release, reflection, reaction, and resolution.

Release. When a new phone is introduced to the market, discourse begins with press releases from the firm introducing it. In the United States, this usually comes from the service provider and the popular press frequently uses the information contained in the press release as the basis

for its initial coverage. Initially, the discourse contains primarily objective or factual information, including specifications and basic functionalities, including information about the carrier itself. Because the discourse contains primarily objective information, I would expect the tenor of the discourse to be neutral, as the market process is in its early stages and market opinion has not yet been formed. However, industry-specific trade magazines are also involved by performing initial tests and publishing reviews based on those tests, so the beginning of an opinion might be formed. However, the audience for trade magazines is typically very technologically savvy customers or innovators/early adopters (Rogers, 1995). Novelty might also have an influence on the shape of the discourse in this first stage. More novel phones typically have a high amount of attention in the early stages as the “buzz” of the more innovative phone is generated.

Reflection. As has been discussed in this dissertation, new products introduce new information into the market, which can cause uncertainty for market participants. Because of this uncertainty, sensemaking is necessary to better understand the implications of this new phone and make a decision whether or not to accept or reject this innovation. During this time of reflection, I would expect the variance in tenor of those participating in discourse to be higher than in the Release stage as more market participants are beginning to form their opinions regarding the new product. Even though more individuals are starting to learn more about the new phone, the characteristics of these early majority participants found in prior research point to their deliberate and more careful nature compared to the early adopters (Rogers, 1995), which may cause them to enter into discourse at a later time period. So as more of these early majority participants are involved in the discourse, the overall volume will increase.

Reaction. After this time of reflection, volume would then begin to rise as more and more market participants have now started to express their opinion via publicly available discourse.

The variance in tenor would also increase as a more open and active debate would ensue over the merits of the new phone. Both the volume and tenor variance will peak at this point as the vast majority of market participants will be engaged in discourse and sensemaking. In addition, other firms in the industry will have had an opportunity to access the potential threat of the originally and may respond with a similar product of their own. Although discourse pertaining to any one particular phone has been found to decrease, on average the volume will rise because of the increase in competitive activity in the industry.

Resolution. After the peak of discourse, both in terms of volume and variance in tenor, I would then expect a decrease in the level of sensemaking activity regarding the focal phone. This decline is indicative of the sensemaking process having run its course and the fact that the market has now made up its mind regarding the phone. The discourse will eventually cease and the variance in tenor will be reduced as a result of the reaching of a consensus by the market.

See Table 11 below for a summary of the four stages of discourse outlined above.

Table 11: Stages of Discourse over Time

Stage	Source	Content	Expected Tenor	Volume
Release	Focal carrier press releases, industry experts, tech savvy customers	Objective, factual information (specifications), focal carrier characteristics	Neutral	Higher for more novel phones
Reflection	Early majority	Some subjective opinion based on initial testing	More variance than Release	Higher than Release
Reaction	Mass market, mainstream/late majority customers	More subjective opinion as more exposure happens	Highest amount of variance in tenor as market is trying to sort out opinion	Highest volume as most participants are engaging in discourse
Resolution	Laggards	Final market opinion	Either predominantly positive or negative	Lower than Reaction to eventually cease

Practical implications

The results from this dissertation highlight several important implications for practitioners seeking a competitive advantage. Market discourse has been viewed in this paper as a critical source of information and input for sensemaking activities, which can benefit various market participants. First, market discourse can be an important source of information for firms engaging in highly risky entrepreneurial activity. Rather than relying exclusively on traditional financial performance metrics, by paying attention to what various market participants are saying about those new products, the focal firm can know whether to continue or to abandon a particular course of action. Second, rival firms can monitor market discourse to decide whether or not to imitate products by other firms in the industry and potentially reduce any advantage a competitor may have. If the majority of the discourse is positive, this could motivate the rival firm to imitate the entrepreneurial to reduce the benefits accrued by the initiating firm. However, if the tenor of the discourse is predominantly negative, the rival firm may not need to waste resources by following the initial firm but can instead act entrepreneurially in its own direction. Finally, all firms in the industry could benefit by monitoring various sources of market discourse, expanding beyond the popular press and industry publications to include customer reviews, blogs, and other forums for public opinion. Although this paper and its conclusions must be considered preliminary, future research on entrepreneurial actions, discourse, and the market process will shed light on the implications of the concepts explored herein.

Limitations and future directions

To test the impact of new products on discourse and the market process, a new measure of novelty was developed. Although not an original intention of this dissertation, this new variable was seen to effectively capture the relative novelty of a complex and multi-dimensional

product and produce a quantitative, comparable, and comprehensive measure across all observations in the data. Although the novelty measure presented here captures the relative difference based on all previously released phones, a recency effect may exist. Therefore, comparing a new phone with phones in temporal proximity (e.g. prior 3 months, prior 6 months, etc.) may be more appropriate and yield different patterns of results. In addition, the current novelty measure incorporates all 61 product characteristic categories identified in Phonescoop and other industry sources; however, grouping the categories in various ways could also be a fruitful path of potential study. For example, certain phone characteristics are more cosmetic in nature (e.g. weight, length, height, antenna type, etc.) whereas others are more technological (processor, operating system) or functional (camera type, video resolution, MP3 player). These various groupings could also be explored to further understand what characteristics drive market discourse and what market participants pay attention to when attempting to make sense of new phones. Further work to validate this measure and to explore the various ways in which it could be applied can help to add to improving innovation measures used in research.

In addition, another key variable in the analysis was the variance in tenor of the articles related to each new product. One reason the results were not found as hypothesized could be due to this measure capturing the average tenor variance of all the articles together. Analysis conducted on an article-by-article basis could be used to explore the relationship between new product novelty, firm reputation, competitive intensity, market discourse, performance, and other interesting dynamics. The full database in this dissertation contains approximately 120,000 articles, which makes such an analysis time consuming and cumbersome, but a more fine-grained analysis of tenor variance and the content of market discourse could add significantly to the literature on entrepreneurship and the market process.

Further, the source of the market discourse has not been differentiated in this study. However, what periodical produced the discourse may have varying effects as certain publications may be more influential than others. For example, the discourse could be sorted by industry experts, popular press on a national and local scale, customer reviews, etc. and the impact of novelty on this discourse and its subsequent influence on sales is also another avenue to explore. Again, with approximately 120,000 articles in the database, such analysis is complicated, but is a potentially fruitful avenue for future research.

Finally, although the volume of discourse was explored in this dissertation using HLM, one potentially interesting area for future direction not included in the above analysis is how the tenor of discourse can influence the rate of adoption of new product introductions. Mapping numerous innovations could produce various slopes and lengths between the different new products, depending on the innovativeness of the action and how much sensemaking and market discourse is required. Although the frequency and cumulative volume of the discourse is expected to have similar shapes to the diffusion of innovation curves, one unknown is how the variance in tenor of discourse will impact the shape of the curves of these discourse measures. High variance in the tenor of discourse is a signal that confusion and a large divergence of opinion exists, which could lead to more discourse and a steeper slope, whereas low variance signals more agreement and therefore less discourse and a flatter slope. If the slopes of the innovation adoption and the market discourse are found to be similar, since information regarding the innovation precedes the decision by market participants, a possible implication is that a firm could monitor the discourse to predict the rate of adoption and strategically position itself accordingly.

Conclusion

A better understanding how market participants deal with new information and new actions by firms is of both theoretical and practical importance. Academics have long since been interested in how markets “move” and this dissertation attempts to advance the theory based on specific entrepreneurial actions 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 entrepreneurial actions drive the market process.

Appendix

Hypothesis testing for Stage 1 with alternate measures of novelty.

New to Firm

	DV: Duration	DV: Volume	DV: Frequency	DV: Tenor Var	DV: Positive	DV: Negative	DV: Rating
New to Firm	0.153* (0.064)	0.358** (0.066)	0.090** (0.017)	0.1 (0.072)	0.114+ (0.066)	-0.049 (0.072)	0.150* (0.076)
Reputation	-0.014** (0.002)	-0.108** (0.007)	-0.016 (0.013)	-0.01 (0.053)	-0.076 (0.048)	-0.117* (0.053)	0.059 (0.056)
Competitive Intensity	-0.202** (0.052)	-0.167** (0.053)	-0.039** (0.014)	-0.049 (0.082)	-0.097 (0.075)	-0.049 (0.083)	0.049 (0.087)
Mult Carrier Dummy	-0.125** (0.002)	-0.294** (0.009)	-0.039** (0.014)	-0.003 (0.059)	-0.029 (0.053)	-0.028 (0.059)	-0.108+ (0.062)
Herfindahl Index	0.123** (0.002)	0.292** (0.006)	0.029** (0.010)	0.057 (0.043)	0.086* (0.039)	0.039 (0.043)	-0.03 (0.045)
Subscribers	0.056** (0.006)	0.270** (0.023)	0.02 (0.035)	0.325* (0.147)	0.409** (0.134)	0.215 (0.148)	0.002 (0.155)
Price	0.190** (0.002)	0.259** (0.008)	0.041** (0.015)	0.002 (0.060)	0.03 (0.055)	0.062 (0.061)	0.074 (0.064)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y
Constant	0.212** (0.038)	0.062 (0.040)	-0.068** (0.011)	-0.073+ (0.044)	-0.002 (0.040)	-0.004 (0.044)	-0.006 (0.046)
Observations	385	385	385	385	385	385	383
Number of Carrier Categories	6	6	6	6	6	6	6
R-squared	0.34	0.19	0.2	0.08	0.1	0.03	0.05

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Total New Categories

	DV: Duration	DV: Volume	DV: Frequency	DV: Tenor Var	DV: Positive	DV: Negative	DV: Rating
Total New Categories	0.092* (0.044)	0.134** (0.005)	0.013 (0.012)	-0.036 (0.049)	-0.023 (0.045)	-0.01 (0.050)	0.062 (0.052)
Reputation	-0.014** (0.002)	-0.080** (0.007)	-0.016 (0.013)	-0.006 (0.053)	-0.072 (0.049)	-0.117* (0.053)	0.056 (0.056)
Competitive Intensity	-0.234** (0.003)	-0.029* (0.012)	0.043* (0.019)	-0.009 (0.077)	-0.052 (0.071)	-0.068 (0.078)	0.106 (0.082)
Mult Carrier Dummy	-0.053** (0.002)	0.072** (0.007)	0.009 (0.012)	0.04 (0.047)	0.023 (0.043)	-0.055 (0.048)	-0.019 (0.050)
Herfindahl Index	0.128** (0.002)	0.344** (0.006)	0.034** (0.011)	0.064 (0.043)	0.094* (0.039)	0.036 (0.043)	-0.024 (0.045)
Subscribers	0.084** (0.006)	0.391** (0.023)	0.043 (0.037)	0.339* (0.147)	0.429** (0.134)	0.201 (0.147)	0.051 (0.155)
Price	0.217** (0.002)	0.473** (0.007)	0.068** (0.014)	0.038 (0.056)	0.069 (0.052)	0.047 (0.057)	0.114+ (0.060)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y
Constant	0.224** (0.038)	0.094* (0.040)	0.036 (0.081)	-0.024 (0.324)	0.448 (0.297)	0.699* (0.325)	-0.333 (0.344)
Observations	385	385	385	385	385	385	383
Number of Carrier Categories	6	6	6	6	6	6	6
R-squared	0.34	0.14	0.14	0.08	0.09	0.02	0.04

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

New Category Dummy

	DV: Duration	DV: Volume	DV: Frequency	DV: Tenor Var	DV: Positive	DV: Negative	DV: Rating
New Category Dummy	0.044** (0.001)	0.133** (0.005)	0.012 (0.010)	-0.017 (0.039)	0.021 (0.036)	0.019 (0.039)	0.056 (0.041)
Reputation	-0.015** (0.002)	-0.071** (0.007)	-0.016 (0.013)	-0.007 (0.053)	-0.076 (0.049)	-0.120* (0.053)	0.056 (0.056)
Mult Carrier Dummy	-0.049** (0.002)	0.091** (0.007)	0.01 (0.012)	0.043 (0.048)	0.034 (0.043)	-0.047 (0.048)	-0.016 (0.050)
Herfindahl Index	0.128** (0.002)	0.344** (0.006)	0.034** (0.011)	0.063 (0.043)	0.093* (0.039)	0.035 (0.043)	-0.023 (0.045)
Competitive Intensity	-0.235** (0.003)	-0.014 (0.012)	0.043* (0.019)	-0.009 (0.078)	-0.054 (0.071)	-0.07 (0.078)	0.104 (0.082)
Subscribers	0.095** (0.006)	0.382** (0.023)	0.045 (0.037)	0.340* (0.147)	0.444** (0.135)	0.212 (0.148)	0.062 (0.156)
Price	0.215** (0.002)	0.469** (0.007)	0.069** (0.014)	0.036 (0.056)	0.064 (0.051)	0.044 (0.056)	0.115+ (0.059)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y
Constant	0.221** (0.038)	0.091* (0.040)	0.036 (0.081)	-0.018 (0.324)	0.467 (0.297)	0.713* (0.325)	-0.33 (0.344)
Observations	385	385	385	385	385	385	383
Number of Carrier Categories	6	6	6	6	6	6	6
R-squared	0.35	0.14	0.14	0.08	0.09	0.02	0.04

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Total Changes within Category

	DV: Duration	DV: Volume	DV: Frequency	DV: Tenor Var	DV: Positive	DV: Negative	DV: Rating
Total Changes within Category	0.015** (0.002)	0.082** (0.005)	0.004 (0.010)	0.006 (0.041)	0.002 (0.038)	-0.037 (0.041)	0 (0.043)
Reputation	-0.010** (0.002)	-0.065** (0.007)	-0.015 (0.013)	-0.009 (0.053)	-0.074 (0.049)	-0.119* (0.053)	0.061 (0.056)
Mult Carrier Dummy	-0.062** (0.002)	0.046** (0.007)	0.007 (0.012)	0.048 (0.046)	0.028 (0.042)	-0.056 (0.046)	-0.033 (0.049)
Herfindahl Index	0.131** (0.002)	0.354** (0.006)	0.035** (0.011)	0.063 (0.043)	0.093* (0.039)	0.035 (0.043)	-0.022 (0.045)
Competitive Intensity	-0.233** (0.003)	-0.014 (0.012)	0.044* (0.019)	-0.01 (0.077)	-0.052 (0.071)	-0.069 (0.078)	0.108 (0.082)
Subscribers	0.079** (0.006)	0.343** (0.023)	0.04 (0.037)	0.348* (0.146)	0.435** (0.134)	0.199 (0.147)	0.036 (0.155)
Price	0.225** (0.002)	0.501** (0.007)	0.070** (0.014)	0.034 (0.056)	0.066 (0.051)	0.047 (0.056)	0.122* (0.059)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y
Constant	0.227** (0.038)	0.096* (0.041)	0.029 (0.081)	-0.011 (0.324)	0.456 (0.296)	0.713* (0.325)	-0.357 (0.345)
Observations	385	385	385	385	385	385	383
Number of Carrier Categories	6	6	6	6	6	6	6
R-squared	0.33	0.13	0.14	0.08	0.09	0.03	0.04

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Category Change Dummy

	DV: Duration	DV: Volume	DV: Frequency	DV: Tenor Var	DV: Positive	DV: Negative	DV: Rating
Category Change Dummy	0.021** (0.001)	0.100** (0.005)	0.006 (0.009)	0.001 (0.038)	0.005 (0.034)	-0.024 (0.038)	0.033 (0.040)
Reputation	-0.010** (0.002)	-0.065** (0.007)	-0.015 (0.013)	-0.009 (0.053)	-0.074 (0.049)	-0.119* (0.053)	0.062 (0.056)
Mult Carrier Dummy	-0.061** (0.002)	0.048** (0.007)	0.007 (0.012)	0.048 (0.046)	0.029 (0.042)	-0.056 (0.046)	-0.029 (0.049)
Herfindahl Index	0.132** (0.002)	0.358** (0.006)	0.035** (0.011)	0.063 (0.043)	0.094* (0.039)	0.035 (0.043)	-0.02 (0.045)
Competitive Intensity	-0.233** (0.003)	-0.014 (0.012)	0.044* (0.019)	-0.01 (0.077)	-0.052 (0.071)	-0.07 (0.078)	0.109 (0.082)
Subscribers	0.080** (0.006)	0.352** (0.023)	0.04 (0.036)	0.347* (0.146)	0.435** (0.134)	0.201 (0.147)	0.04 (0.155)
Price	0.225** (0.002)	0.500** (0.007)	0.070** (0.014)	0.034 (0.056)	0.066 (0.051)	0.047 (0.056)	0.120* (0.059)
Manufac Dummy	Y	Y	Y	Y	Y	Y	Y
Constant	0.226** (0.038)	0.094* (0.041)	0.029 (0.081)	-0.009 (0.324)	0.456 (0.296)	0.710* (0.325)	-0.368 (0.344)
Observations	385	385	385	385	385	385	383
Number of Carrier Categories	6	6	6	6	6	6	6
R-squared	0.33	0.13	0.14	0.08	0.09	0.03	0.04

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Hypothesis testing for Stage 2 with one-month lagged sales

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales	DV: Sales
Lagged Articles per Month (1)	0.033** (0.003)					
Lagged Articles per Month (2)		0.017** (0.003)				
Lagged Articles per Month (3)			0.009** (0.003)			
Lagged Articles per Month (4)				0.013** (0.003)		
Lagged Articles per Month (5)					0.015** (0.003)	
Lagged Articles per Month (6)						0.008** (0.003)
Lagged Sales per Month (1)	0.861** (0.004)	0.863** (0.004)	0.865** (0.004)	0.864** (0.004)	0.864** (0.004)	0.865** (0.004)
Lagged Sales per Month (2)						
Lagged Sales per Month (3)						
Lagged Sales per Month (4)						
Lagged Sales per Month (5)						
Lagged Sales per Month (6)						
New to Market	0.007 (0.007)	0.011 (0.007)	0.013+ (0.007)	0.012 (0.007)	0.011 (0.007)	0.013+ (0.007)
New Products	-0.008 (0.006)	-0.010 (0.006)	-0.011+ (0.006)	-0.010+ (0.006)	-0.011+ (0.006)	-0.011+ (0.006)
Mult Carrier Dummy	0.008+ (0.004)	0.009* (0.004)	0.009* (0.004)	0.009* (0.004)	0.009* (0.004)	0.010* (0.004)
Herfindahl Index	0.012 (0.008)	0.014+ (0.008)	0.015+ (0.008)	0.014+ (0.008)	0.014+ (0.008)	0.015+ (0.008)
Subscribers	0.015 (0.014)	0.015 (0.014)	0.016 (0.014)	0.016 (0.014)	0.016 (0.014)	0.016 (0.014)
Price	-0.010+ (0.006)	-0.008 (0.006)	-0.007 (0.006)	-0.008 (0.006)	-0.008 (0.006)	-0.007 (0.006)
Manufac Dummy	Y	Y	Y	Y	Y	Y
Constant	-0.009* (0.004)	-0.007+ (0.004)	-0.006 (0.004)	-0.007+ (0.004)	-0.007+ (0.004)	-0.006 (0.004)
Observations	14960	14960	14960	14960	14960	14960
Number of Carrier Categories	6	6	6	6	6	6
R-squared	0.77	0.77	0.77	0.77	0.77	0.77

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Mediation testing with same month sales lag

	Model 1	Model 2	Model 3	Model 4
	DV:Monthly Sales	DV: Lagged Articles (1)	DV:Monthly Sales	DV:Monthly Sales
New to Market	0.015* (0.007)	0.235** (0.020)		0.007 (0.007)
Lagged Articles per Month (1)			0.033** (0.003)	0.033** (0.003)
Lagged Sales per Month (1)	0.866** (0.004)	0.160** (0.011)	0.861** (0.004)	0.861** (0.004)
New Products	-0.012+ (0.006)	-0.122** (0.017)	-0.004 (0.005)	-0.008 (0.006)
Mult Carrier Dummy	0.010* (0.004)	0.065** (0.011)	0.008+ (0.004)	0.008+ (0.004)
Herfindahl Index	0.016+ (0.008)	0.098** (0.024)	0.015* (0.008)	0.012 (0.008)
Subscribers	0.016 (0.014)	0.035 (0.040)	0.015 (0.014)	0.015 (0.014)
Price	-0.006 (0.006)	0.122** (0.016)	-0.008 (0.005)	-0.010+ (0.006)
Manufac Dummy	Y	Y	Y	Y
Constant	-0.005 (0.004)	0.140** (0.012)	-0.009* (0.004)	-0.009* (0.004)
Observations	15004	15300	14960	14960
Number of Carrier Categories	6	6	6	6
R-squared	0.77	0.06	0.77	0.77

Standard errors in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

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