

**Social Beliefs and Markets:
The Problem of Categorization, Justification, and Innovation**

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Abstract:

This article develops a theoretical conceptualization of a market epistemic system - how beliefs about products and market get formed and justified. Such conceptualization is necessary because prevailing social theories of markets contend that beliefs about firms and product induce conformity and limit change, but innovations often defy current categorization and beliefs to their economic benefit. I show how current theory presents an account of justification that is 1) incompatible with its social construction of beliefs, and 2) leaves unexplained how a market can accept new beliefs. To rectify the internal inconsistencies, I build upon Durkheim and Wittgenstein to argue that both belief formation and justification are embedded within social processes. To resolve the second issue, I argue that justification requires communities to cohere a new belief with the existing belief system. Building off of Douglas and Bloor, coherence varies based upon the structure of the pre-existing belief system leading to different reactions to new beliefs. The structural differences express the conditions under which beliefs mediate market behavior and provide a way of conceptualizing the dynamics of belief systems. The value of this epistemic system is demonstrated by its ability to explain innovation while not forfeiting the intuition that beliefs constrain behavior.

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Social theory has long been interested in the relationship between belief systems and social behavior, with a recent focus on how epistemic constructs shape economic behavior (see (Porac, Ventresca and Mishina 2002) for a review). In fact, the presumption that beliefs constrain behavior is at the heart of prevailing sociological explanations of markets and organizations in diverse literatures as organizational theory and marketing. Neoinstitutionalists hold that beliefs about how firms should look and act induce firms to adopt these procedures (DiMaggio and Powell 1983; Meyer and Rowan 1977). In ecological models, organizational inertia results from the increased scrutiny and decreased trust of firms that stray away for these institutionalized beliefs (Hannan and Freeman 1984; Hannan and Freeman 1989, chapter 5). In network models of markets, producers suffer severe penalties if they do not adhere to prevailing production schedules (White 1981; White 2001). In marketing, socially constructed interpretations of products constrain their evolution (Rosa et al. 1999) and how customers interact with them (McCracken 1986). Recently, sociologists have begun to apply cognitive frameworks, in particular classification systems, to explain how these constraints work (Ruef 1999; Zuckerman 1999). Mental categories are “the material of logical thought” (Durkheim 1912 [2001]) that help actors simplify and clarify a complex social reality (DiMaggio 1997; Hannan, Polos and Carroll 2007). It is argued that if a candidate offering, such as a product or organizational form, does not fit into a prevailing category, it is ignored, encouraging adherence to the prevailing belief system (Fligstein 2001; Zuckerman 1999).

However, there are cases in which actors defy the prevailing classification system to their benefit. Many of these cases center upon innovations that reveal the dynamic nature of classification systems. One form of innovation changes the boundaries of an existing category; for example, farmers extended the conventional concept of an automobile as a source of transportation by using it as a stationary source of power (Kline and Pinch 1996). Another form blends the boundaries between two categories, such as what occurred in French gastronomy (Rao, Monin and Durand 2005). Yet another type introduces an entirely new category to the schema, sometimes to great economic benefit (Schumpeter 1942). Before the commercial introduction of the automobile or computer, for instance, classification schemas did not include these categories. Thus, there are

times when beliefs clearly constrain market behavior and others when they do not, suggesting that social explanations of markets have not properly specified how and under what conditions belief systems mediate market behavior.

Part of this problem stems from the lack of attention to the epistemic systems that underlie a market, despite affording beliefs significant normative power. Epistemic systems explain how communities both form and justify beliefs (Knorr-Cetina 1999; Stehr and Meja 2005). Substantial research of these systems has been done within scientific communities, but less so in economic markets. Social theories of organizations provide hints about how such an epistemic system could work by making claims about the social origins of categories and taking certain categories for granted, but they lack a systematic account. Understanding how the processes of belief formation and justification work can help explain how beliefs mediate market behavior. Closer inspection reveals that current institutional and structural approaches found in sociological explanations of markets, in particular neoinstitutional, ecological, and structural accounts, are insufficient because they lead to an internally inconsistent and an overly constrained epistemic system. They share with Durkheim (1912 [2001]; 1901 [1963]) the belief that categories are the product of social interaction; however, the social construction of beliefs makes it difficult to explain how beliefs could constrain market behavior. Current approaches introduce constraints either through appealing to role structures or an institutionalization process, but both are incompatible with the socialized account of belief formation and create too demanding constraints that do not allow the community to accept new beliefs. Even though there may be institutional entrepreneurs (DiMaggio 1988) trying to change belief systems, existing sociological theory leaves unexplained how the community can accept these changes.

In this article, I address these issues by theoretically conceptualizing an epistemic system within an economic market: how propositional beliefs about products and firms come about, gain meaning, and get accepted within an economic market. To rectify internal inconsistencies, I build upon Durkheim (1912 [2001]) and Wittgenstein (1958; 1969) in arguing that both the formation and justification of beliefs are embedded within a social process. Justification of beliefs includes both confirmation of validity and coherency with other beliefs. The coherency criterion reveals the variety of different

relationships categories can have beyond just the presumed similarity and differences, and that contrary to current assumptions, evaluators can justifiably understand what a category is without knowing anything about its membership. Categorization's epistemic function is not just to organize thought, but also to be a source of novelty and imagination (Lakoff 1987).

Simply socializing justification, however, does not address the second issue of how a community can accept a new belief into the system. The social norms of justification can be just as restrictive as the current structural and institutional approaches. Building off of Douglas (1966; 1973; 1975) and Bloor (1983), I identify the structural characteristics of the categorical system that explain the conditions under which a community integrates a new belief. Douglas extended Durkheim's early work on religious belief systems to expose the different aspects of social control, what she calls grid and group, underlying social organization. Grid and group control vary in strength and the various combinations explain different reactions to anomalies. Analogous to Douglas's grid/group distinction, I argue that category schemas vary in their internal structures as well as the distinctions between categories. Some cognitive frameworks, for instance, have well organized internal structures with clearly defined grades of membership and clearly marked boundaries between categories; whereas, in other frameworks these distinctions are less established. The different combinations of internal structure and external relations express the conditions under which a cognitive framework mediates the response to new beliefs. In so doing, it provides a more nuanced view of acceptance/rejection of innovations, showing that epistemic systems can accept innovations by assimilation or opportunism and reject innovations either by expulsion or indifference. As a result, the normative import of a cognitive framework does not come solely from determining membership as currently presumed, but from the very structure of the framework itself and what types of categorical anomalies it allows to be viable. The value of this conceptualization is demonstrated by explaining how epistemic systems allow for the dynamics of innovation. This analysis extends Douglas' initial work which is initially comparative in nature to show how it can also explain change.

I begin by further defining the key characteristics of an epistemic system and how they apply to economic market settings. I then construct the epistemic systems of current

social theories of markets based upon their use of categorization to show the internal inconsistencies and inability to explain the acceptance of new beliefs. Current approaches such as ecological models of change and institutional entrepreneurs do not resolve these underlying epistemological issues. This critique motivates the structural approach which provides a more robust account of the different ways a new category or belief can change a belief system while not forfeiting the intuition that beliefs constrain behavior.

EPISTEMIC ISSUES WITHIN SOCIOLOGICAL EXPLANATIONS OF MARKETS

Epistemic systems explain how actors within a community both create and warrant knowledge: the formation and justification of beliefs (Knorr-Cetina 1999).¹ Belief formation considers the dynamics of generating and changing the particular beliefs actors have. It asks, why do actors believe what they do and how do these beliefs change? The sociological literature has paid substantial attention to belief formation through its discussions of the construction of categories (Durkheim 1912 [2001]; Durkheim and Mauss 1901 [1963]; Lounsbury and Rao 2004; Ruef 1999; Ruef 2000). However, it has paid much less attention to the justification of these beliefs. Justification explains when actors are on good grounds to believe what they do. Philosophy tells us that justification is necessary because the way in which a belief is formed does not guarantee that actors should believe it (Audi 2003). There are all sorts of possible good reasons to warrant belief in a proposition: other beliefs, experience, testimony, memory, self-evident truths, or even conformity with social norms. But, justification does not mean that in order to be justified in believing a proposition, an actor must go through a

¹ By considering the formation of the beliefs as well as justification, sociologists bridge the psychological literature which is mostly concerned with belief formation and the philosophical literature which is primarily concerned with justification. Organizational sociologists frequently incorporate insights from each literature, but do so in piecemeal fashion which contributes to some of the limited views and inconsistencies.

process of providing reasons; sometimes justification occurs implicitly or a belief is taken for granted. Belief formation and justification interrelate with each other to create a dynamic epistemic system. The process of accepting or rejecting new beliefs is the epistemic engine that enables belief systems to evolve (Kuhn 1970).

Sociologists of knowledge contend that epistemic systems vary across communities (Berger and Luckmann 1966; Stehr and Meja 2005). Knorr-Cetina (1999), for instance, shows that different scientific communities have different epistemic cultures, even to the level of cognitive structures and who is the epistemic agent. Consequently, it is important to specify the salient characteristics of an epistemic system within an economic market. The primary activities within a market involves various actors engaged in production, evaluation, exchange, and consumption. The evaluative nature of a market entails generating propositional beliefs about the firms and products involved in the exchange; for example, “I believe that organizations of form X are good at producing this product.” Sociologists have generally been interested in these kinds of propositional beliefs and their effect on the producing firms and products that are their objects (DiMaggio and Powell 1983; Hannan, Polos and Carroll 2007; Rosa et al. 1999). Consequently, even though there are many other kinds of knowledge claims within an economic market, I will focus on these propositional beliefs about firms and products. In addition, we often speak of “market knowledge” as if the epistemic agent was the collective market. Although collective agreement may give the impression of one opinion, the epistemic system operates at the individual actor level. That said, it is reasonable to presume that collective interpretations certainly influence individual belief formation and justification.

As a result, an epistemic system of an economic market, then, explains how propositional beliefs about products and firms form and get accepted. These beliefs center around attitudes toward what a firm or product should look like and act as well as their categorization. The justification of these beliefs expresses the reasons to hold them. For theoretical purposes, we are not so much interested in delineating each reason, but in understanding what counts as a sufficient reason to hold this belief. It is in having justification that gives these beliefs their normative power. With acceptance, beliefs have the authority to shape behavior.

Of course, sociological theories of market behavior rarely speak using this epistemological language. Since at least Durkheim, sociologists have presumed that concepts or categories form the basis of belief statements, “The material of logical thought (1912 [2001], p. 327)”. And, categorization is primarily portrayed as an epistemic process that actors use to clarify and simplify incomplete and complex market information (DiMaggio 1997; Hannan, Polos and Carroll 2007; Lounsbury and Rao 2004; Zuckerman 1999). Consequently, a large part of the discussion of belief formation centers upon how concepts get defined and used to generate these beliefs about products (Rosa et al. 1999) and firms (Hannan and Freeman 1989). Thus, social theories claims about the characteristics of categorization reveal presumptions about belief formation and justification within economic markets. For example, arguing that certain categories get taken for granted assumes that no additional reasons are needed to justifiably hold this belief. From these statements, we can construct and evaluate the market epistemologies implied within each theory.

My main critique asserts that current sociological theories provide inadequate accounts of justification. They are incompatible with their socialized account of belief formation and overly constrain the epistemic system such that they cannot explain the introduction of new beliefs. To make this argument, I begin with their articulation of the social origins of belief formation. Social construction of beliefs makes it difficult to explain how beliefs could constrain market behavior. Current approaches introduce constraints either through appealing to role structures or an institutionalization process, but both are incompatible with the socialized account of belief formation and create too demanding constraints that do not allow the community to accept new beliefs.

Sociological theories follow Durkheim’s insight that classification is a product of social relations (1912 [2001]; 1901 [1963]). Categories are “collective representations” that do not belong to any one individual but are the product of the community. According to this view, product and firm categories get their meaning through the recurrent use and social interactions of customers, producers, and mediators within the market. This social process lies at the center of Gidden’s (1984) structuration process and the construction of Berger and Luckmann’s (1966) social reality. Within a market setting, Orlikowski (2000) leverages Gidden’s structuration process to argue that

cognitive structures emerge through enactment. She shows how the meaning of Lotus notes technology emerged through the customers extended use of the product. Neoinstitutionalists also appeal to Giddens's structuration process to explain the emergence of the structures that define various organizational forms (DiMaggio and Powell 1983). Social movement theory identifies the interplay of self interest, resources, and political power in the creation and maintenance of categories (Lounsbury and Rao 2004; Rao, Monin and Durand 2005; Rao, Morrill and Zald 2000). Population ecologists also now describe the emergence of a category as a social process of coming to collective agreement (Hannan, Polos and Carroll 2007). Finally, sociological explanations of consumption also insist that the cognitive representation of products result from the enactment of the products (Rosa et al. 1999) and the social interaction of the actors who use them (McCracken 1986).

Durkheim originally presented this view in direct response to the prevailing realist and empiricist philosophical explanations of categories (Durkheim 1912 [2001]).² It is instructive to see how this socially-based view of meaning contrasts with the traditional philosophical view, in particular realism. According to the philosophical view (see (Lakoff 1987) for a review in cognitive psychology and (Bloor 1983) in philosophy), a thought category is an analytic entity, completely divorced from the reality it organizes and the actor doing the classification. Justification entails confirming objective validity – that the category does in fact identify the correct members. Actors must learn what the category means and then apply it to understand the world. Thus, both aspects of the epistemic system are decidedly under socialized. In turn, the causality of meaning and belief formation is reversed from Durkheim's social account. Actors must learn and apply the logically implicit meanings of categories to make sense of the world as opposed to the social context determining categorical meaning.

In essence, this explanation amounts to a behavioral account of belief formation. Beliefs form as the by-product of the social practice of the market. The social characteristics of belief formation also provide a clear explanation of the dynamics of beliefs. This approach entails that new uses or interactions can change beliefs, such as

² Wittgenstein repeats this same rhetorical approach when he builds his social theory of meaning and knowledge.

the farmer's use of the automobile for stationary power. Use, itself, is a form of experiential learning (Rosenberg 1983; Von Hippel and Tyre 1995), and what actors learn can change the prevailing categorization. For example, Yates's study (1993) of the insurance industry's use of tabulating machines reveals that their extended use created new understandings and interpretations of the product. They first understood the technology as a tool to do computational work in actuarial studies, but then learned that it could be applied to process repetitive information tasks in customer billing and record management. This behavioral account of categorical meaning suggests that the aforementioned issues with innovation are not within the belief formation aspect of the epistemic system. New beliefs certainly can emerge, but the justification process does not allow for these new beliefs to be accepted.

The social construction of categories creates two issues for justification. First, it localizes meaning and belief creation enough to allow for multiple belief systems to exist within a market. Orlikowski (2000), for instance, observed that the interpretations of the Lotus Notes technology differed across its usage contexts. Local interpretations may vary even in cases where the community has reached consensus on the meaning of the classification scheme (Bowker and Star 1999). Economic markets seem particularly prone to multiple interpretations given the different roles various actors play. Customers, for instance, focus on available choices and usage conditions; whereas, the producer perspective comes from competitive positioning (Rosa et al. 1999). These belief systems cannot be too distinct; otherwise, exchange would not occur. However, it is often presumed that either the audience belief system should be privileged because they do the evaluating or that some form of collective agreement occurs. However, Zuckerman (1999) warns that in certain market structures, such as monopolies or diffuse audience networks (Padgett and Ansell 1993), the audience's belief system may not matter. Therefore, to the extent that differences in belief system exist, the epistemic system must account for which belief system gets privileged in the justification process.

The second issue centers on whether actors are justified in applying a particular category. This issue is best illustrated through an example. If an actor asserts that "I believe that product X does not belong in category Y", one may respond that he is not justified in this belief because he misapplied the concept Y. But, the social construction

of meaning entails that categorical meaning is extendible, requiring additional explanation of why the actor was justified in denying X membership in category Y. We could say, for instance, that because X exists, category Y really means Y+X. This particular issue is pervasive in economic markets because competition dictates some level of differentiation between firms and products. So, although offers will be similar to be included within a category, they differ in some way (Zuckerman 1999). This difference can raise doubts as to whether the category is correctly specified. This issue also matters theoretically because propositional beliefs get their normative power through the justified application of categories. To say that an instance does not fit a category implies that the evaluator knows what correctly belongs in that category and correctly applies it. Yet, it is not clear how a cognitive framework can constrain market behavior when the very meaning of its categories depends upon market behavior. A full account of justification, in turn, requires additional explication of what determines whether the actor correctly applied the category.

Sociological theories interpret this tension in terms of the stability of classification schemas. Given the role of categories in the cognitive process, sociological theories presume that if a classification schema is stable, it has the integrity and authority needed to shape behavior (Hannan and Freeman 1989; Meyer and Rowan 1977; Zuckerman 1999). Here stability refers to what Durkheim calls the “clearly determined lines of demarcation (Durkheim and Mauss 1901 [1963], p. 4) or what belongs in that category. Yet, Hannan and Freeman (1989) point out that “the lines of demarcation” are not always stable. It is during these periods of instability, for instance, that niche width theory predicts that firms can successfully violate categorical boundaries (Freeman and Hannan 1983). However, it is presumed that stable boundaries ensure clear understanding of what belongs and does not such that an actor would not be challenged to provide reasons to substantiate his understanding of a category. Current approaches count of the fact that the skeptical question of the correct application does not come up when the categories are well defined and stable.

The literature has identified two sources of this stability, one structural and the other institutional. The structural approach follows Durkheim’s original insight that thought categories reproduce social order. White’s network model of production

markets, for example, argues that firms are not isolated entities, but are organized and ranked within “tangible cliques of producers watching each other” (1981, pg. 543; 2001). In competition, these firms enact and reproduce these role structures. This self-reinforcing behavior ensures that the cognitive framework is stable and properly followed. The reinforcing role structures in conjunction with the overall market structure also explain which belief systems matters in justification.³ In some markets, the audience explicitly creates categorical schemas to evaluate products, for example, the clustering of firms in stock market analysis (Zuckerman 1999), different film genres and ratings in entertainment (Hsu 2006; Zuckerman et al. 2003), or classification of cuisine in gastronomy (Rao, Monin and Durand 2003). Given their strong position within the market, this schema gets privileged. In other market structures, the producer’s viewpoint may dominate: monopolies or markets with diffuse customer networks (Padgett and Ansell 1993).

However, the appeal to role structures, in general, does not fully appreciate how much these cognitive frameworks are embedded within the actor doing the classification. Market participants within a role may have different belief systems. Resource partitioning theory, for instance, argues that even within the evaluator’s role, different audience segments can evaluate producers based upon different belief systems that are often incompatible (Carroll 1985). For example, in the beer industry, one set of consumers sees the category microbrewery as incompatible with mass brewers; whereas, another does not identify such sharp boundaries (Carroll and Swaminathan 2000). Something more discrete than role structure is needed to account for the justification of beliefs. In addition, since role structures essentially reinforce current beliefs, changes in the cognitive framework require the role structure to change. However, as mentioned, extended use of a product, such as the farmers, can create new interpretations and classifications of a product without a corresponding change in role structure. The market did not respect the farmers as some higher authority to accept this change, in fact, many in the market tried to emphasize their lower status with respect to the automobile (Kline

³ White does not explicitly consider roles other than production, arguing instead that customers mirror the producing firm’s cost, production schedules, and revenue. Following Zuckerman (1999), I relax this assumption to more generally consider how a particular category schema gets privileged given that there may be multiple roles within a market.

and Pinch 1996). Even though role structures give an account of epistemic authority, it is too constraining to explain the sources and acceptance of innovative changes to the classification schema.

Another approach, common to population ecology, neoinstitutional and social movement theories of organizations, appeals to an institutionalization process. According to this view, in certain cases, categories become institutionalized – actors collectively agree upon what a category means, which, in turn, decouples it from the social reality that created it; actors then take this meaning for granted and apply it to future cases (DiMaggio and Powell 1983; Hannan, Polos and Carroll 2007; Meyer and Rowan 1977). The social construction of technology literature, for instance, describes institutionalization as closing the “interpretive flexibility” of the object (Pinch and Bijker 1987). Early on, different social groups have different perceptions of the object, but through a socially negotiated process, they converge to form a collective understanding of the category. Thus, the answer to the first issue is that actors come to collective agreement as to what the classification schema looks like. The decoupling process then addresses how this socially constructed meaning has the authority to shape behavior. Decoupling removes this meaning from the social reality that created it such that variations in use do not necessarily change its meaning (Lounsbury and Rao 2004; Meyer and Rowan 1977). Decoupling ensures that the skeptical questions about the application of a category never come up within the system. If an actor applies the collectively agreed upon meaning, no further justification is necessary.

The way institutionalized categories function in justification, however, is incompatible with the social construction of categories. To see this requires probing the institutionalization a bit further. We should ask, what counts as a correct application of an institutionalized category? Since the category is decoupled from social reality, the answer does not lie there. This leaves the implicit meaning of the category itself. It is the fact that we collectively decided that category Y’s meaning is such that X does not belong that justifies my belief that X does not belong. Hannan and colleagues state,

In other words, after the audience segment has defined a class, the enthusiasts (and possibly other agents) try to abstract from extensional descriptions to some abstract code that makes sense of the class and can be used to decide not-yet-considered cases (2007, p. 59).

Social factors disappear in the sense that this abstraction, what they call a social code, now “decides not-yet-considered cases”. Marketing models follow a similar pattern. Even though their socio-cognitive explanations allow for socially constituted product markets, their depiction of meaning transfer focuses on how the thought category influences the individual actor (McCracken 1986; Rosa et al. 1999). In essence, decoupling ensures that following an institutionalized categorical meaning is a matter of fact, simply brought about by reaching consensus on its meaning. This view, except for the ontological status of categories, is essentially the same as the objective epistemology that Durkheim earlier rejected. As a result, the institutionalized approach presents a view of justification that is incompatible with its view on belief formation.⁴ On the one hand, categorical meaning depends upon social interaction, but on the other it does not as actors take what an institutionalized category means for granted and apply it to make future sense of the market.

This approach also results in an overly constrained epistemic system that cannot explain changes in the classification system. The constraints do not come from the social structure, but from the decoupling that justified the classification schema. A common criticism of institutionalism, in general, is that it cannot explain institutional change subsequent to the institutionalization (Barley and Tolbert 1997; Hirsch and Lounsbury 1997; Tolbert and Zucker 1983). Closer inspection of the epistemic system reveals that this institutional issue is not so much about the ability to create change, but the restrictions the existing institutionalized system has in accepting these potential changes. It is as if institutionalization over justified its current belief system to the extent that it cannot accept new beliefs. To see why this is the case, let’s walk through common resolutions to this problem.

One way to resolve this issue implicitly admits to this epistemological inconsistency, but argues that the different epistemologies occur at different times in a market lifecycle. Evolutionary models of market lifecycles recognize that the

⁴ To their credit, Hannan and colleagues recognize this: “If we took this route [Wittgenstein’s], then we would define a schema as a set of family resemblances with not pattern serving as the standard. Instead, we made the opposite choice, because we think that his fuzzy image does not represent how agents actually use schemata. The literature on cognitive science makes clear that people use schemata to simplify, to clarify a complex reality for ease of cognitive processing (2007, pg. 63).” The objective epistemology also creeps back into more general sociologies of knowledge and action; for example, Giddens’s (1984) dual aspect of structure and the reliance upon objectivity in Berger and Luckmann’s (1966) social construction of reality.

competitive dynamics of an industry change over time (Hannan and Freeman 1989; Utterback and Abernathy 1975). One of these changes includes the ways that actors understand and accept beliefs about the market. Early on in a market's life categories lack clear definition suggesting that actors learn socially through experience, but once the product's "interpretive flexibility" closes (Pinch and Bijker 1987), the categories' meanings are more definite and institutionalized. During this period, social reality does not generate categories, but actors use these rules to understand the market.

Institutionalization, in turn, implies a certain innovation trajectory: only incremental structural refinements to the classification system occur after institutionalization and to the extent that a new interpretation or schema emerges, it is exogenous (Tushman and Anderson 1986). Highlighting the epistemic system shows that even if the source of a new category is exogenous, institutional theory must still explain how the existing market understands and accepts this new category.⁵ Recently, the institutional literature has identified institutional entrepreneurs (DiMaggio 1988) who "lead efforts to identify political opportunities, frame issues and problems, and mobilize constituencies" to "spearhead collective attempts to infuse new beliefs, norms, and values into social structures" (Rao, Morrill and Zald 2000, p. 240). Yet, even if we allow for institutional entrepreneurs to exist externally to the belief system, they do not explain how the rest of the community accepts the new beliefs. According to the theory, the community should remain committed to and dogmatically support the prevailing institutionalized classification system. After all, it is through this system that the community makes sense of the world.

In addition, exogenous factors are not the only way classification schemas change. Tripsas (2006), for instance, observed that learning new uses and interpretations of a product can also lead to significant categorical changes. She showed that significant technological changes in the typesetting industry resulted after newspapers began using typesetting technology to print images in addition to the traditional use to print text. In the case of the automobile, consumers, like farmers and tourists, used the automobile

⁵ Sometimes the new innovation occurs within a separate market in which the new category may already be incorporated, for example, Christensen's disk drive examples (1996). However, in many cases, including Christensen, the innovation crosses over to the existing market, requiring additional explanation of how they accept it.

differently, often leading to technological changes (Clark 1985; Franz 2005; Kline and Pinch 1996). Also, Yates (1993) showed how significant technological changes in tabulating machines resulted from insurance firms applying it to new uses. The farmers and insurance firms changing conventional interpretations of existing categories do not seem to fit the mold of a politically astute institutional entrepreneur. They simply learned new uses through experience with the technology or adapted an existing technology to local usage conditions. However, it is not clear how an institutional entrepreneur could even endogenously emerge in this situation. According to current theory, they should also remain constrained by the existing cognitive framework.

More generally, the combination of endogenous and exogenous categorical changes associated with frequent innovations within a market suggest that even though a market may move towards a dominant design or understanding of a technology it contains both institutionalized and non-institutionalized categories at any given time. Even incremental changes of an existing category that occur after institutionalization require some interpretation. Some of these changes, as in Tripsas' newspapers and Yate's (1993) insurance firms are quite significant. However, the co-occurrence of institutionalized and non-institutionalized categories leads to an inconsistent market epistemic system, given the different epistemologies between these kinds of categories.

In summary, the primary source of these issues comes from an incomplete account of justification within the epistemic system. Social theories have begun to develop a social conceptualization of justification, explaining how the prevailing interpretation depends upon social factors such as structure and collective agreement. However, this account of justification only explains how acceptance of a belief occurs and leaves unexplained what counts as an acceptable application of this concept. For example, it shows why the product minivan is defined the way it is, but it does not explain why using minivan to refer to a bus may be viewed as an incorrect or correct application of the concept of minivan. Social theories fall short because they just explain how the individual actor gets the standardized definition of a category and then presume that actors consistently apply it. It becomes taken-for-granted, a social code. The resulting epistemic system becomes over constrained because once justified, decoupling removes these interpretations from the social reality that created it or the replication of

existing social structures prevents change. However, as the cases of innovation show, there is substantial variation in the application of categories, even after standardization. There always is the potential for someone applying the concept in an unforeseen way. Thus, epistemic systems cannot take the application of a justified categorical meaning as a matter of fact. Epistemic systems require further clarification of what gets counted as an acceptable reinterpretation of a category or the emergence of an entirely new category.

TOWARD A SOCIAL EPISTEMOLOGY OF MARKETS

The critique of the prevailing epistemic systems shows the need for consistency between explanations of belief formation and justification and a system which is not overly constrained epistemologically. The formation and acceptance of beliefs must allow for new beliefs to be created and enter an existing belief system. In his work on pre-modern belief systems, Durkheim develops an epistemic system in which the formation and justification of beliefs are embedded within a social process (Durkheim 1912 [2001]; Durkheim and Mauss 1901 [1963]). Wittgenstein later built a social theory of meaning that shares many of Durkheim's principles. Between the two accounts, an epistemic system emerges in which both belief formation and justification are socially embedded.

This system can best be described by Wittgenstein's slogan – "meaning is use" (1958). Like Durkheim, categories, concepts, beliefs are social objects that are determined by the systematic patterns of use. He states, "the mental experiences which accompany the use of a sign undoubtedly are caused by our usage of the sign in a particular system of language (Wittgenstein 1969, p. 78)." In addition to belief formation, justification is also a social matter. By declaring that meaning is use, Wittgenstein unites meaning with the application of the concept, where institutional accounts ultimately separate meaning from application. As a result, for Wittgenstein justification is the conformity of the application of the category with conventional

practice. In his words, “To obey a rule, to make a report, to give an order, to play a game, are customs (uses, institutions) (Wittgenstein 1958, p. 199).” Just as meaning is a social practice, so is justification; quite simply, the community decides whether an actor correctly applied the concept.

This social view of justification differs significantly from the previously described institutional approach. We can see this contrast by reconsidering the statement, “I believe that product X does not belong in category Y”. According to the institutional approach, categorical meaning is decoupled after collective agreement which entails that further justification is not a social process. It is an individual act where justification comes from correctly applying the implicit meaning. In Wittgenstein’s approach, there is no abstraction to an implied meaning of a category once social agreement occurs. There is no decoupling. Rather, the justification of my use of category Y comes from the fact that the community recognizes that this is the conventional use of category Y. If, on the other hand, the community decides that Y+X makes more sense, then the categorical meaning changes. Therefore, by basing the justification of the application of categories within the community itself, Wittgenstein’s theory of justification is consistent with his theory of belief formation.

However, Wittgenstein does not specify what this conformity entails, what the community uses as criteria to determine whether the category is used correctly. Here, Durkheim is helpful as he elaborates reasons to believe something:

Conversely, it is hardly the case that concepts, even when they are constructed according to all the rules of science, derive their authority only from their objective value. It is not enough for them to be true to be believed. If they are not in harmony with other beliefs, other opinions, in a word with the whole gamut of collective representations, they will be denied; minds will be closed to them; they will be as if they never were. (1912 [2001], pp. 333-4).

Durkheim’s comments identify two conditions to justify beliefs: objective validity and coherency.⁶ Objective validity refers to the internal consistency of the concept and whether reality corresponds to its intentions – firms that are in a category really exhibit

⁶ Despite recognizing these different criteria of justification, Durkheim never developed a social theory of justification to the same extent he did of belief formation. In fact Durkheim and Mannheim (1991) isolated epistemic practices of science primarily because of their stricter rules for justification. Since then, Bloor (1973) has used Wittgenstein’s notion of the social practice of following a norm to show that this is a false distinction.

the qualities implicit in what the category means.⁷ For Durkheim, objective validity is not enough for justification as the belief must also be “in harmony” with other beliefs. The belief is consistent with other beliefs.⁸ Justification, in turn, requires coherency with the existing conventional understanding of other categories.

The additional requirement of coherency with the schema further reveals the limitations of the current conceptualization of categorization’s epistemic functions. For current approaches, market understanding is a function of the way in which market objects get classified. Classification operates through determining whether a case is a member of a prevailing category. For instance, the first step in Zuckerman’s two-stage model and the initial screen in marketing models determine if the candidate is an instance of the category (Urban, Hulland and Weinberg 1993; Zuckerman 1999). To the extent that external categories are even considered, it is to establish contrast or clear demarcation between categories. Thus, “fitting in” is the cognitive practice of judging how similar an instance is to others within a category and the differences between categories. Population ecologists, for example, recently describe this process in terms abstracting membership rules from observed similarity-clusters and contrasting between categories, justifying this claim by appealing to a branch of cognitive psychology (Hannan, Polos and Carroll 2007).

However, similarity and difference comparisons are only one way in which a category can be consistent with other classifications. In cognitive psychology, Lakoff (1987) identifies a different kind of external relationships – “radial structures” in which some categories extend the meaning of a core concept. For example, concepts such as “birth mother” or “step mother” extend the core concept of “mother” into different

⁷ Objective validity is an important and interesting concept that does not receive sufficient attention, especially as it relates to authority. Of course, sociologists define “objective” as relative to the social context, where philosophers define it in more analytical terms. In Durkheim’s quote, he certainly downplays objective validity’s role in the category’s authority. Institutional accounts echo this interpretation, arguing that legitimacy can occur regardless of the belief’s validity (Meyer and Rowan 1977).

⁸ This coherency theory of justification emerged through the rationalists school of thought in philosophy, an approach Durkheim was aware of through his criticism of its category ontology (Durkheim 1912 [2001], pp. 10-21).

directions.⁹ The marketing literature identifies analogies between existing product domains and novel products as a way to help consumers learn the new product's benefits without fully understanding its technical details (Gregan-Paxton and John 1997; Moreau, Markman and Lehmann 2001; Sujon and Bettman 1989). Analogical comparisons do not involve identifying shared common characteristics, but are rhetorical devices to extend the concept (Fogelin 1988; Lakoff 1987). As a result, fitting in is not simply a literal exercise of establishing different combinations of similar characteristics. It can be done figuratively, establishing much looser and different types of connections.¹⁰ Coherency is a lower and broader epistemic criterion than similarity.

As a result, contrary to existing theory, "fitting into a category" is not a necessary condition for actors to understand that category. To illustrate this important point, consider Yate's (2005) analysis of the insurance industry's initial adoption and use of the computer. This is a case where the market, the insurance industry, confronted a novel product, the computer. Insurance firms did not try to identify the similarity clusters of the category or fit the computer into pre-existing categories as categorical membership would predict. Instead, insurance firms made analogies between the computer and tabulating machines and the human brain. Each comparison identified similarities with the computer – a computer can process repetitive tasks like at tabulating machine and make decisions like a human brain. In this case, the collective comparisons with the tabulating machine and the human brain helped established the differences between the computer and any one category. Computers are not like tabulating machines because they can also "think" like humans, but they are not like humans because they more efficiently process repetitive tasks. The insurance industry was successfully able to understand the computer without establishing its own internal membership or assimilating it into any prevailing category.

⁹ Current approaches also assume only hierarchical relationships (think of nested natural systems of classification (Clark 1985; Hannan, Polos and Carroll 2007; Rosch and Lloyd 1978)). However, Lakoff's insights mean that categorical schemas vary in their structural relationships.

¹⁰ The notion of coherency also suggests alternative ways to measure relations between categories. It is common to use Tversky's similarity measure which compiles the numbered of shared attributes (Hannan, Polos and Carroll 2007; Rosch and Lloyd 1978); however, this measure does not capture analogies. A more appropriate measure of analogy may be the correlations between relevant properties (Giere 1994). Ruef (1999) has explored alternative ways to map relationships between categories.

Thus, the focus on categorical membership as the primary epistemic function of classification schemas pays insufficient attention to both the broader schema in which a category is embedded and the other types of comparisons an actor may make.¹¹ Coherency is a broader criterion for justification which embraces similarity, but also allows for a variety of other comparisons observed within a market. Consequently, Durkheim and Wittgenstein have made two important clarifications for an epistemic system. First, both belief formation and justification are embedded within social processes. The social aspects of justification extend beyond just collective agreement upon what a category means (as presumed in institutional accounts) to also include the determination of whether an actor correctly applied the category. Second, they reveal that justification also requires consistency with other beliefs, which expands our understanding of the epistemic functions of classification. Therefore, market beliefs about products and firms are constituted through the social process of formation and justification.

These two insights are consistent with other findings about the role of categories within economic markets and innovation. Since categorical meaning is not an intrinsic property but emerges through use, actors can engage with products even if they do not fully understand what it means. Consequently this social epistemology is consistent with other sensemaking theories of organizational cognition that postulate that organizations often make sense of the world only after they act (Weick 1979), and with the observation that market actors often interact with and use market objects before they develop an explicit categorical definition (Hannan, Polos and Carroll 2007; Ruef 1999). Moreover, by giving a more prominent role to the external relationships between categories while broadening what kind of these relationships could be, a social epistemology explicitly recognizes the power of the entire cognitive structure in imaginative thought. Such cross-category comparisons and linkages lie at the heart of the common characterization of

¹¹ Hannan and colleagues (2007) do recognize that in many cases new categories emerge when a structured schemata already exists. In these cases, such as the computer, analogies with existing categories play a role. But, they develop their categorization model from unstructured cases in which there is no well formed schemata to compare, and thus they focus on categorical membership and establishing contrast. However, perspectives on learning and innovation suggest that pre-existing schemata play a role in understanding novel technologies and products (Cohen and Levinthal 1990; Hargadon and Douglas 2001). This does not mean that analogies are always used, but it points to the limitations of building a model on unstructured cases.

invention as the novel recombination of existing concepts and technology (Fleming 2001; Gilfillan 1935; Nelson and Winter 1982; Rosenberg 1983). Categories do not just classify things but also generate new knowledge through novel comparisons.

However, even though this social epistemology provides a more robust explanation of categorical change, it appears to also suffer from a highly constrained justification system. Since justification entails coherency with conventional understandings, new beliefs cannot enter the system to the extent that convention does not accept it. Durkheim recognizes the authority and necessity that these beliefs have as well as the difficulty in changing them. He states,

We say that an idea is necessary when, because of some internal quality, it imposes itself on the mind without any additional proof. There is something in it, then, that compels the intellect, that encourages acceptance without previous examination. ... So society cannot abandon these categories to the free will of particular individuals without abandoning itself. ... Therefore, to prevent dissident views it leans on its members with all the weight of its authority. What happens when a mind openly departs from these norms of thought? Society no longer considers that mind human in the full sense of the word, and treats it accordingly (Durkheim 1912 [2001], pp. 18-19).

Once these “norms of thought” are socially established and reinforced, it becomes difficult to introduce new beliefs. This issue persists, for example, in Kuhn’s explanation of scientific change. Similar to Durkheim and Wittgenstein, Kuhn (1963) believes that the process of the community accepting a new belief determines what it means. Kuhn (1970) then argues that a paradigm shift – a change in the norm of thought – is a consequence of the accumulation of exceptions. But, he does not explain how the community can even accept these exceptions, especially given their commitment to the existing paradigm. The original institutional issue of community acceptance of a new belief has reappeared. The social epistemic system still lacks an explanation of why a particular system holds the beliefs it does and how it can accept new beliefs.

Mary Douglas’ structural analysis of classification systems helps address the acceptance of new beliefs issue. Building off of Durkheim’s analysis of classification systems in religion, Douglas (1966; 1973; 1975) constructs a typology to explain the variation of responses to anomalous, impure, taboo things within the religious schema. She distinguishes between two types of control: group control or the pressures just from

being a member of a group and grid control or the conventions that apply regardless of being a member of the group (which she initially expresses in terms of whether a classification system was publically shared). These types of control vary in terms of their strength, forming four different combinations of social organization, e.g., some forms have strong grid, but low group control, but in other cases both are strong. Response to anomalous things, in turn, depends upon this social structure. For example, social organizations with strong group pressure, but low levels of internal rank and classification tend to perceive dissidents as threats and exclude them; however, if group boundaries were also less strong, the group is more likely to see the new case as justification for an alternative approach (Douglas 1973).

Bloor's (1983) adoption of this cultural typology to explain Wittgenstein's social theory of knowledge is also instructive. He takes taboo to represent a categorical anomaly, a new use of pre-existing category or an entirely new category, such that the social structure of the "language game" determines the reactions to these anomalies. Here, Bloor uses Wittgenstein's language game as analogous to Douglas' social organization, but never specifies what features matter. Since acceptance of a new belief requires its justification, we can specify these salient features by focusing on the categorical system and Durkheim's two criteria for justification. Objective validity, in part, specifies the internal characteristics of a category; whereas, consistency with other beliefs explains the external relations between categories. From a structural perspective, the justification process involves appeals to both the internal and external structure of a category schema. Analogous with Douglas' and Bloor's grid/group typology, variations in the combinations of internal and external categorical structure of the prevailing classification system explain how the epistemic system accepts new beliefs. As a result, Durkheim's "norms of thought" vary in social structure, some of which exclude entry of new beliefs, but, in others, they allow exploitation or assimilation of new ideas.

To complete the analogy, however, requires further clarification of both the dimensions in which internal and external structures vary and the potential community responses. Cognitive psychologists and sociologists have appealed to another Wittgensteinian concept, "family resemblances" (1958), to explain the complex

membership structure of categories.¹² Wittgenstein argued that a category does not need to have common elements in order to be understood and used; rather, each item can have at least one element in common with other items, but no elements are common to all items. Think of a family – a daughter may have her father’s nose, mother’s eye, and uncle’s hair color, but there is no one set of characteristics which the entire family has. Since a category consists of overlapping attributes, not every member shares the same level of overlap. Some members who exhibit more of the redundant features of the category are more prototypical or central than peripheral members who share less of these features (Rosch and Lloyd 1978; Rosch and Mervis 1975). Zadeh (1965) calls these different levels of centrality gradations of membership. For example, a desktop computer seems more central to the category personal computer than a tabulate computer or a personal device with a keyboard and Internet access. Based on this notion of core and periphery, categories vary in the level of structure; where, structured categories are ones in which there are clear gradations of membership within a category.

A cost of defining categories as a set of family resemblances is that categories are potentially infinitely extendable. Although a new item may differ from most of the member’s characteristics, it would nevertheless belong to that category as long as it shares any attribute with a member. The farmer’s new use of the automobile illustrates such an extension. Even though the farmer’s use of the automobile as a source of stationary power contradicted the intuitive notion that automobiles are used for transport, such use belongs to the automobile category because it shared other characteristics. Moreover, technically an airplane and an automobile would be in the same category because they share some common characteristics such as wheels and windows. However, the social construction of categories explains various ways in which boundaries and structures get defined. Following Giddens (1984) and Orlikowski (2000), the construction of the meaning of a category also defines its structure. The structure can depend upon a variety of social factors, including social processes of agreement as well as enactment. For instance, collectively agreeing upon what a category means also

¹² The application of family resemblances to explain categorical structure has a long standing research stream in cognitive psychology (Rosch and Lloyd 1978; Rosch and Mervis 1975). Several sociologists have applied this concept to their discussion of market category formation (Hannan, Polos and Carroll 2007; Ruef 1999).

entails agreeing upon its salient features. Pinch and Bijker's negotiation process not only defined what the bicycle (1987) is, but also its core and periphery structure.¹³ Or, a powerful actor may become the prototypical member centering the category upon its characteristics (Lounsbury and Rao 2004). Kahl (2007) observed that despite the idiosyncratic nature of use, patterns of use can emerge such that the market converges on a common usage, implying that the market also converges on what the category means. Lastly, social factors also influence which and what kinds of comparisons are made between categories. For instance, in Yate's insurance case with the computers, the industry associations, not the producing firms, played the important role of building and disseminating the analogies. Despite the infinite possibilities of connecting categories, social factors dictate which certain connections are emphasized.

Along the external dimensions, the broad nature of consistency suggests that categories can have different kinds of relationships with each other. Some relationships reduce the distinction between categories; whereas, others increase demarcation. Again, reconsider Yate's (2005) case of the computer in the insurance market. The multiple comparisons of the computer with tabulating machines and the human brain establishes weak boundaries between the computer and these two categories. However, in so doing, it showed how tabulating machines and humans differed, further strengthening the contrast between these categories. Thus, external relationships vary in the degree of "contrast": the level of boundary demarcation and distinction between categories (Hannan, Polos and Carroll 2007).

Figure 1 pulls this discussion together to construct the structural framework of classification systems. Internal category organization varies according to the level of structure in terms of well defined grades of membership; whereas, external relationships vary in terms of the degree of contrast between categories. This structure emerges through the social process which defines the categories. These variations create four prototypical categorical structures: high internal structure, high contrast; low internal structure, high contrast; low internal structure, low contrast; high internal structure, low contrast. Therefore, at any point in time, we may draw the cognitive framework of a

¹³ This view of the social origins of core/periphery within categories contrasts with the popular view within the technology literature that the technical interdependencies determine what is core and periphery of a technical system (Baldwin and Clark 2000; Murmann and Frenken 2004).

belief system by building the network of relationships between categories and the internal structure of each category.¹⁴ Whether the community accepts a new belief depends upon the local structure of the classification system the new belief wants to enter.

Insert Figure 1 Here

Following Douglas and Bloor, these structural combinations explain how different epistemic systems react to anomalies. Low internal structure, but high contrast classification schemas exclude new beliefs. In this case, the cognitive framework clearly separates categories without having a strong sense of internal order within a particular category. This structure expels any anomaly in order to maintain internal consistency, where the strength of the boundary determines its ability to prevent the entry of the new belief. For example, consider the reaction of the telephone industry to the anomalous use of the phone for social purposes (Fischer 1992). Like the introduction of many new technologies, the potential uses of the phone were not well understood upon its commercial introduction, resulting in a product category that lacked internal cohesiveness. According to Fisher, even though the telephone producers recognized that the phone had many uses, including social ones, they focused on fostering business uses. To the extent that they marketed to households, they emphasized how the phone can help manage the business of the house and not its social uses. Through these marketing campaigns, early phone companies established clear boundaries of the phone. Thus, the category schema of the early telephone was one of high contrast between categories, but low internal structure. When farmers started introducing the use of the phone for social purposes, the phone companies rejected it due in part to how they constructed the phone

¹⁴ There is one important point of clarification: Douglas and Bloor apply this structure to an entire social organization or language game, but it is unlikely that a classification system will exhibit the same structure universally across the entire system. At any given time, it is not the case that all categorical boundaries have high contrast but low internal structure. As previously mentioned, it is more likely that these structural features are localized to certain categories and that the entire system exhibits multiple structural features.

category.¹⁵ Given their strong market position, these boundaries held even as customers began presenting a more diversified view of the phone.

By comparison, a high internal structure and contrast structure assimilates new beliefs into the existing schema. In this case, there are well defined levels of membership as well as distinction between categories, representing the stable categories most often considered in the literature. This highly structured system entails that many complex relations have emerged and been accounted for within the system. As a result, actors do not perceive the new belief as a threat as in the previous structure, but instead they try to assimilate it in a way that fits with the existing schema. Assimilation results in restructuring, particularly within categories, but can also occur between categories. To illustrate, consider Rosa and colleagues' (Rosa et al. 1999) description of the introduction of the minivan. The pre-existing structure of the automobile was highly organized internally with clear differences between cars, trucks, vans as well as clear demarcation between automobiles and other categories. Customers and producers tried to integrate what we now call the minivan into this classification schema by making a series of comparisons with existing kinds of automobiles. Eventually, they assimilated the minivan as a distinct group within this classification scheme of the automobile.

Low internal structure and contrast treat new beliefs as opportunities. Because there is a lack of boundary between categories as well as within the internal structure, this combination lacks any type of significant constraint, making it difficult to justify that the new belief belongs within a particular category. As a result, actors do not try to accommodate these new cases into the existing structure as in assimilation, but leave it alone with an eye for exploitation. The new belief is viewed as an opportunity for new approaches. Analysis of the introduction of the automobile suggests that its initial categorical structure supported this type of reaction. Similar to the telephone, the internal structure of the automobile lacked strong distinctions (Clark 1985), but unlike the phone, the producers did not draw sharp boundaries between the automobile and other categories. As a result, when new uses emerged, the automobile companies perceived these as opportunities to think of the automobile in new ways. They thought of ways to

¹⁵ Of course the cognitive structure is not the only reason they rejected the social use of the phone; however, it is a clear example of how sharp categorical boundaries with little internal cohesiveness support this type of response.

exploit these new opportunities. For example, historian Kathleen Franz (2005) describes how customers actively engaged in the construction of the automobile through user modifications such as lights, electric starters, and new bodies. Many of these modifications entailed consumers creatively comparing the automobile with other categories, in one instance, thinking of the automobile as a living room on wheels (Clark 1985). Companies, in particular Ford, embraced these creative uses and even help disseminate it through articles and pictures. In fact, one of the early pictures of Ford with an automobile was with it being used as a stationary source of power (Kline and Pinch 1996). In contrast with the phone, this market did not reject alternatives, but exploited them as new ways to think about the automobile.

Finally, high internal structure but low contrast simply ignores new beliefs. This structure paints a picture of fragmentation because there is no significant distinction between categories. Yet, there is high structure within the category making it more difficult to incorporate within any particular category. As a result, actors leave these new cases alone as opposed to excluding it. They simply ignore it, but not opportunistically as they do not try to take advantage of it.¹⁶ To illustrate, consider the early adoption of software within manufacturing firms (Kahl 2007). Kahl notes that early on the internal structure of software became clearly demarcated through convergence to particular uses of software, such as to administer repetitive clerical tasks. However, the boundaries between software and other categories, especially the computer, were less clear considering that computer operators bundled software with computers and programming involved lower level integration with the computer. Consequently, when new uses emerged, such as using the software to manage decision processes in production planning, they simply were ignored. It was not until software became more clearly demarcated that new uses were treated more opportunistically.

As way of summary, Figure 2 outlines the different responses depending upon the structure of the classification system the new category tried to enter. Paying closer attention to these structural features explains why a social epistemic system does not

¹⁶ Ignorance represents some of the earliest recognized forms of skepticism and differs from exclusion (Stroud 1985). Exclusion implies reflective thought about the current state of affairs and providing reasons as to why; whereas, ignorance simply is indifference. This difference has implications for how the belief system evolves after the initial response.

necessarily prevent the entry of new beliefs. Following Douglas and Bloor, Durkheim’s “norms of thought” and Kuhn’s paradigms have different structures. In some, there are sharp boundaries between categories and strong internal structures and in others they are less strong. Responses to anomalies vary depending upon these structures. Categorical membership is not just a matter of accepting and rejecting a new instance as current sociological theory presumes – cognitive frameworks can accept opportunistically, assimilate into existing structures, or they can reject by exclusion or ignorance. Since justification is a social activity that requires coherency with existing beliefs, the internal and external features serve as the principle constraints. To see how this works requires re-examining the initial puzzles surrounding beliefs, constraints, and innovation.

Insert Figure 2 Here

EPISTEMIC STRUCTURES, INNOVATION, AND THE CATEGORY DYNAMICS

The value of the social epistemic system can be demonstrated in terms of its ability to explain the initial empirical paradoxes surrounding innovation: addressing the frequent changes in categorical systems while preserving their ability to constrain behavior. Some of these changes are endogenous in the sense that the market develops new interpretations of the categories through extended interaction with the market objects; whereas, in other cases, they are exogenous as outsiders, perhaps with a different classification schema, introduce an entirely new category.

The initial approach found in the literature emphasizes the social construction of belief formation which explains these changes, but at the cost of providing constraints.

Since categorical meaning ultimately depends upon the social setting in which it is enacted, thought categories can endogenously evolve through extended enactment, like the farmer's use of the automobile for stationary power or the insurance firms learning new uses of tabulating machines. Exogenous changes can simply be incorporated as the market interacts and engages with the new products and firms. Theoretically, categories are always extendible, by definition of the construction of categorical structures as family resemblances (Lakoff 1987; Ruef 1999). However, socially constructed standards may emerge to establish artificial boundary extension as well as define internal structures. Constraints enter through the justification process as firms only need to adhere to beliefs to the extent that they are accepted. Current sociological theories interpret justification in terms of a stable category which is taken for granted either because of reinforcing role structures or decoupling of collective understanding of the category. However, since the meaning of the category is no longer tied to social reality, these approaches cannot address future change. They are helpful for one episode of change, but cannot explain the more continuous changes that the innovation cases suggest happens in many industries.

The social epistemology approach, in contrast, argues that justification is embedded within a social process. Even though social norms do evolve around what a category means, following a norm is a social process that requires sanctioning by the community (Bloor 1983; Durkheim 1912 [2001]; Wittgenstein 1958). Justification requires that a belief coheres with the existing belief system – it must fit in a loose sense and not only in the strict sense of being similar or dissimilar. More importantly for explaining change the conventions reached within the community have different structures. New beliefs in the form of categorical extensions or entirely new categories are assimilated, expelled, ignored, or treated opportunistically in the belief system depending upon the social structure of the pre-existing classification scheme. Therefore, the constraint of the epistemic system comes from the social acceptance of new beliefs, not from the stability of the category. The constraint of the epistemic system, in turn, is not simply whether it fits with accepted beliefs, but how that belief is determined to be coherent with existing beliefs.

This social epistemic system also addresses dynamics of change because the underlying classification system is dynamic. It is not restricted to explaining one period of change, but explains the underlying dynamics of belief formation as well. This extends Douglas' and Bloor's originally use of the grid/group typology for comparative purposes. Since the acceptance or rejection of a new belief entails different forms of integration with the existing belief system, the justification process changes the structure of the classification system. The previous examples of the different responses illustrate these differences. Sometimes the new belief leads to further internal structuring as in the case of the minivan; in others, it establishes a new category with weak contrast and internal structuring as in the initial introduction of the automobile; in others, it is passively allowed to exist, but does not integrate with the existing software system; whereas, in others, it is actively excluded against as in the social uses of the telephone.

The introduction of a new belief, not only has a direct affect on the categories to which the new belief is compared, but it also has secondary effects on the relationships between other categories. Yate's (2005) example of the computer demonstrates these secondary effects. Not only did the integration of the new computer category determine boundaries between itself and tabulating machines and human brains, it redefined the relationship between tabulating machines and the human brain. More precisely, it established more contrast between the two by showing the ways in which a tabulating machine is not like the human brain – brains make decisions, whereas tabulating machines do not. As a result, after going through the process of justifying a belief, the belief system's structure changes itself. No two beliefs face the same justification structure.

It is important to realize that this structural change is a feature of the justification process itself, an artifact of the requirements to cohere with the existing belief system. As a result, the structure of the belief systems changes whether the belief is accepted or rejected. Indifference or expulsion does not mean that the belief disappears – it still exists, but it has the feature of not being integrated with the existing belief system. Consequently, it is possible that some time in the future a new belief may emerge which either assimilates the category or treats it more opportunistically. For example, the concept of an electric car re-enters at a later time period because the underlying belief

system has changed enough such that it can incorporate this concept in more meaningful ways. As Basalla (1988) reminds us, change is not just about what gets selected, but also what gets left behind. This social epistemology approach not only helps us understand why a concept gets left behind, but also why it may reappear later.¹⁷

However, this model does not predict the direction of change. As mentioned, prevailing evolutionary models of innovation predict that the classification system follows a certain trajectory: the selection among competing interpretations and then further incremental refinement thereafter, until an exogenous radical change occurs (Pinch and Bijker 1987; Tushman and Anderson 1986; Utterback and Abernathy 1975). This model captures this trajectory in the shift from a schema in which both the contrast and internal structure are low to one in which both are high.¹⁸ When these structural features are low, alternatives are treated opportunistically, but when they are high, alternatives are integrated into the existing classification system. However, assimilation does not necessarily follow opportunism. For example, if the contrast and internal structure of the new category solidifies, then the next period would be one of assimilation. However, if only the contrast becomes sharper, then the next period should exhibit characteristics of expulsion; if only the internal organization became more structured, the next period should exhibit characteristics of indifference. This model provides a more robust explanation of change within a belief system because it is not limited to one kind of trajectory, but provides the necessary conditions for different kinds of possible change. The direction of change depends upon what structural features, internal or external, change as the new belief integrates within the system.

As a result, the social epistemic system has important ramifications for the study of innovation and industry change. By placing justification in the hands of the community, this view suggests that it is possible that a belief will be defined and justified

¹⁷ Integration with an existing belief system also suggests an endogenous nature to belief formation and evolution not presently captured in demand-oriented models of evolution (Adner 2004; Christensen and Bower 1996; Sutton 1998). These models presume that beliefs are fixed and only change through structural changes in the demand market and substitutability of products.

¹⁸ This perspective also suggests other important refinements to evolutionary models. First, evolutionary models presume the initial period of technological change is the opportunistic periods; however, this only occurs in certain circumstances where both the internal and external structures are loosely defined. Second, it provides an explanation of how endogenous change of a radical nature can occur. A new belief, for instance, may not be assimilated into the internal structure of the prevailing categorical system, but instead formed as a distinct category which relates to the existing structure.

in a way not imagined by the actors who proposed the new idea. This insight dates back to earlier explanations of the role of the community in scientific method in which a discovery is only part of the community to the extent that the community allows it to be (Bloor 1997; Kuhn 1963; Latour 1987; Popper 1969). This model, in turn, explains why this occurs: Because justification is not just confirmation (objective validity) but also integration with other beliefs (coherency), the process of establishing consistency can change the interpretation of the belief. Empirically, this difference frequently happens with innovations as the market uses products in ways not intended by the producer (Lounsbury and Rao 2004; Oudshoorn and Pinch 2003). Farmers use cars as stationary sources of power, telephones for social purposes; newspapers use printing technology to print images as opposed to texts. How radical an innovation truly is depends upon how it is justified in its applications, which, in turn, is a function of the social structure of the classification system with which the innovation must cohere. Innovations that require radical new capabilities and technologies may be integrated as incremental changes to existing technologies, or vice-versa. Again recall Yate's analysis of the computer: despite the fact that the computer was radical in construction, the insurance market thought of the computer as similar to a tabulating machine and used it incrementally.

As a result, the epistemic system helps clarify a tension in the organizational literature about the relevance of external categorical relationships in establishing the legitimacy of new forms. One perspective downplays the importance of relations between categories by focusing on the need to distinguish from existing categories. This perspective implies that presenting a focused identity that contrasts highly with other categories enhances a new firm's recognition and survival (Hannan, Polos and Carroll 2007). McKendrick and colleagues (2003), for instance, argue that providing a coherent identity and agglomerating around this related identity increases survival chances of new organizational forms because it increases perceptual focus for evaluators. This view emphasizes the importance of the internal structure of a new category while assuming that contrast is necessary for survival. Or, actors manipulate categories to reduce the number of competitors to which they have to pay attention (Porac et al. 1995).

In contrast, another perspective pays closer attention to the role of other categories in establishing recognition and legitimacy. This view implies that establishing

strong relationships with existing categories should enhance the survival of new forms. Hargadon and Douglas (2001) argue that innovators should include design elements that invoke pre-existing schemas to facilitate consumer understanding and adoption. However, there is a limit: comparing with a highly established category can prevent actors from recognizing the legitimacy of the new category (Ruef 2000). Although cross-category comparison helps create familiarity, ultimately, a category must establish and sustain its differences with other categories. If not, it risks being subsumed into the other category. For example, in the computer case, the collective comparisons with the tabulating machine and the human brain helped establish the differences between the computer and any one category.

This approach integrates both views by specifying the conditions when presenting different identities make strategic sense. Belief systems with loosely internally structured categories and less clear demarcation between categories tend to treat new beliefs opportunistically without must assimilation into the existing schema. This structure suggests that when presenting a new idea, establishing similarities with existing categories may not be necessary. However, strengthening either the internal structure or the contrast can generate skeptical responses that limit adoption. In these cases, establishing similarities appear to play a more important role. But, similarity depends upon whether the internal structure or the external contrast increases. Strong internal structure suggests that showing how the new idea shares similar features to different members within the category may lead to acceptance; however, this strategy would not work so well if there is only strong contrast between categories. In these cases, the community does not fully understand the different gradations of membership and are not as well qualified to make these comparisons. Therefore, knowing about the internal and external structure of the classification scheme helps entrepreneurs design and position their innovations to maximize adoption. Successful entrepreneurship is not just about coming up with a new idea, but anticipating how it will be received and integrated into the existing system.

CONCLUSION

Economic markets are evaluative by nature such that actors form judgments about products and firms as part of their exchange activity. Leading social theories of markets and organizations contend that these beliefs shape the behavior of firms and products by inducing conformity (DiMaggio and Powell 1983; Meyer and Rowan 1977) or limiting significant change (Hannan and Freeman 1984; Hannan and Freeman 1989, chapter 5). Despite the normative implications of belief systems, social theories have paid less systematic attention to how these beliefs get formed and justified. One of this article's goals is to simply clarify what an epistemic system looks like for these prevailing theories.

The clarification reveals a significant tension between the explanation of the social origins of beliefs and a less social version of justification. Sociologists have long been interested in the social construction of thought categories and beliefs, but have generally left the justification of these beliefs unexplained. Yet, grounding our beliefs in social behavior makes it difficult to ascribe to these beliefs the necessary authority to shape subsequent behavior. They presume that social structure or collective agreement involved in the process of belief construction provides the necessary reasons to warrant belief. However, philosophers have long argued that belief formation does not entail belief justification. Even though philosophers are generally interested in a much more objective measure of justification than sociologists, the point still remains. Social theory of markets and organizations lacks a sufficient account of justification that underlies the normative power of institutionalized beliefs.

To fill this void, I presented a social explanation of justification based upon Durkheim's and Wittgenstein's theories of knowledge. Just like belief formation, justification is a social process in which the community determines if beliefs cohere with existing belief systems. Coherency as the prime justification criterion shows the limited view current approaches have of categorization and its epistemic function. Categories do not just organize thought by establishing similarities and differences between concepts, but they extend thought through figurative comparisons. Coherency also suggests that

more empirical and theoretical work needs to be done about the tacit assumptions used to compare different categories. Why is it that certain comparisons are made and not others?

The explanations of innovation demonstrate the value of this social epistemic system. Scholars have long criticized current social theory for not being able to address the types and frequency of change often observed within industries. Innovation proves difficult to explain while also trying to maintain the normative implications of beliefs. Closer inspection of the implied epistemic practices in existing theory reveals that the issue lies more in justification of new beliefs than in their creation. The issue is not so much in the ability to create new beliefs, but in the overwhelming restrictions the existing belief system has in accepting these potential changes. Douglas and Bloor help resolve this issue by showing that different coherent categorization systems have different structures. I express these differences in terms of the internal structure of categories as well as the external relations between categories. These different structures lead to different reactions to innovations – expulsion, ignorance, assimilation, or opportunism. Innovation is not a binary process of acceptance or rejection as commonly characterized in the literature.

This structure also provides a way of conceptualizing the dynamics of belief systems. Through the process of justification itself, communities determine if an innovation coheres with the existing system, which in turn changes the underlying structure. The structure of classification system evolves, but always has a given structure when considering an innovation. Stability is not necessary as previously assumed. As a result, the true value of this social epistemic system is that it begins to develop the social structure of innovation – why is it that an innovation is accepted the way it is? Why do communities accept innovations in different ways? Addressing these questions can enhance our understanding of the relationship between innovation and market dynamics.

Finally, highlighting the social aspects of belief formation and justification also has important methodological implications. Social theories have long resisted fully integrating customer beliefs because of the empirical difficulty of capturing their tastes and beliefs (White 1981; White 2001). Even current approaches tend to select industries in which the categories are explicit and socially constructed and maintained by critics or take

these different categories for granted. However, by bringing up Wittgenstein's slogan "meaning is use", we can see that customers' interpretations can be expressed through how they use the product. Use is more concrete than taste or need, enabling scholars to identify usage patterns as a proxy for customer beliefs about a product. In addition, one could use network analysis tools to map out a classification scheme and measure the variation in internal categorical organization and different structural positions between the categories. The figurative aspect of categorization, such as analogy, also suggests the possibility of exploring new network relationship measures. Thus, the social epistemic system has real methodological and empirical tractability that enables further testing of its implications and continued theoretical development.

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Figure 1: Various Internal and External Structure Combinations of Classification Schemes

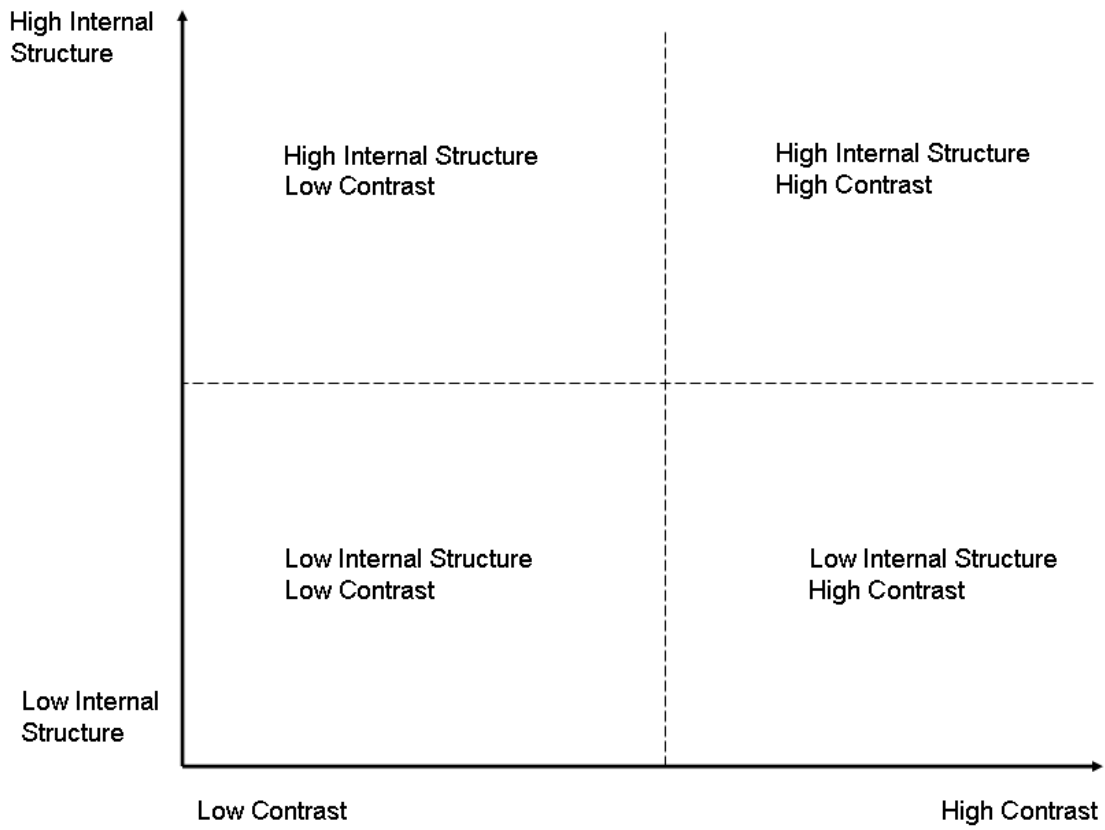


Figure 2: Different Responses Based upon Categorical Structure

