KNOWING YOUR ROLE: THE IMPACT OF REPUTATION SIGNALS ON

PARTICIPATION IN AN ONLINE COMMUNITY

by

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A DISSERTATION

Presented to the Department of Marketing
and the Graduate School of the University of Oregon
in partial fulfillment of the requirements
for the degree of
Doctor of Philosophy

June 2016

DISSERTATION APPROVAL PAGE

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Title: Knowing Your Role: The Impact of Reputation Signals on Participation in an Online Community

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Degree awarded June 2016

DISSERTATION ABSTRACT

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   Online Community

Generating and maintaining participation in online communities is critical to their success. In this research, I investigate how the design of the reputation system can influence user participation. Specifically, I explore differences in individuals' perceptions of the two most common reputation signals: points and labels. Using theory from sociology and social psychology, I argue that reputation signals vary in role clarity and signals with greater role clarity foster a community atmosphere, leading to greater user connectedness and participation behaviors. By observing a natural experiment on the T-Mobile support community, which changed its reputation signal from points to labels, Study 1 demonstrates that labels drive greater user participation (more discussions and comments) than points. To test role clarity as the underlying construct, Study 2 compares points and labels differing in role clarity, and shows that high role clarity is critical to generating the positive effects. Study 3 shows that providing additional role information can strengthen the impact of low role clarity labels on participation intentions. The final four studies address situations in which role information is more or less critical to the user experience. Study 4 surveys members of a newly-built online community, and finds that users' community tenure moderates the preference for labels, such that new users'

participation is influenced by the reputation signal, but not long-term users. Study 5

shows that low status users are more willing to participate when labels are used, but high

status users are driven to participate when the community uses either reputation signal

type. Study 6 finds that when community membership turnover is greater, points and

labels have a similar effect on participation intentions, while labels drive participation

when there is little community membership turnover. Finally, Study 7 confirms that face-

to-face interaction mitigates the positive advantage of labels. These findings have

important implications for the use of reputation signals as a strategic tool when managing

online communities.

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PUBLICATIONS:

Hanson, S. & Jiang, L. (2016). The Low Status Advantage: The Effect of Status Structure on Participation in an Online Community. Electronic Markets, DOI 10.1007/s12525-015-0200-3

ACKNOWLEDGMENTS

I dedicate this manuscript to my husband, Brian, for supporting me along the way, challenging my theorizing, and letting me adopt a puppy to snuggle between revisions.

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CHAPTER I

INTRODUCTION

Branded online communities have become an integral part of doing business, as customer membership can have a direct impact on the bottom line. A recent study found that customers who join online communities increase their online purchases online by 37% and offline by 9% (Manchanda, Packard, and Pattabhiramaiah 2012). A key component of these communities is the way in which users' reputation in the community is signaled (Lampel and Bhalla 2007). As such, many communities adopt a reputation signal procedure or system as a way to convey trust and reliability in the information presented in the community by aggregating users' past contribution behaviors (Dellarocas 2003; Resnick, Kuwabara, Zeckhauser, and Friedman 2000). While one community might construct a hierarchy of labels to display user status such as Newbie, Citizen, and Super Citizen, another may use numerical scores such as points. For example, users in the National Multiple Sclerosis Society community gain points based on the number of comments they post to the community and the number of appreciations they gain from other users. Other communities, such as like Proctor and Gamble's Being Girl community and Random House's Figment online writing community, feature no reputation signal at all.

Yet, most communities employ one reputation signal type or highlight one type over another if multiple types are used simultaneously. Even when points and labels are used to signal reputation concurrently, a pilot study I conducted ($n = 80$) indicates that individuals tend to rely on one reputation signal type (points or labels) as the major signal (i.e., 70% of participants in a multiple signal condition could recall only one signal type)

and directional evidence suggests the presence of multiple signals may be confusing. As such, the focus of this research is to systematically explore differences in individuals' perceptions of two of the most common reputation signals independently.

Community owners go to great lengths to promote status and reputation in an effort to motivate their users to participate by posting new discussions and commenting on existing discussions (Bolton, Katok, and Ockenfels 2004; Wasko and Faraj 2000). Yet the information systems and human-computer interaction (HCI) literatures have paid little attention to explaining how different types of reputation signals impact individuals' participation behavior. There are many ways that firms can design a reputation system (De Alfaro, Kulshreshtha, Pye, and Adler 2011; Chen, Harper, Konstan, and Li 2010; Dellarocas 2010; Goes, Guo, and Lin 2014; Marti and Garcia-Molina 2005; Masclet and Penard 2012). Additionally, existing research in the IS literature has shown that different types of visual information presentation can influence decision-making and knowledge acquisition (i.e., graphs versus tables; Benbasat and Dexter 1986; DeSanctis 1984; Dickson, DeSanctis, and McBride 1986; Jarvenpaa and Dickson 1988; Tractinsky and Meyer 1999). Yet, to my knowledge, no research on information presentation in the online community context has been conducted. I explore the reputation signal as a new type of information presentation. Specifically, I show that the type of reputation signal is important information that will impact the users' online experience, thereby demonstrating that interface designers should consider the presentation of reputation signals as a strategic tool to motivate online behaviors. Can the type of reputation signal impact users' participation in an online community? If so, what types of signals are most effective and why? Additionally, does a user's existing level of participation in the

community influence their perception of different types of reputation signals? These are some of the key questions I address in this research.

The current work extends existing research on online communities, user status and reputation systems, and the design of HCI systems. A number of studies have considered how community features and reputation-related rewards influence user contributions in the online context (Bretzke and Vassileva 2003; Chen et al. 2010; Cheng and Vassileva 2005; Harper et al. 2005; Ling et al. 2005). Additionally, research across the domains of open source software and e-markets indicate the functional and motivational value of reputation systems (Hertel, Niedner, and Herrmann 2003; Lakhani and Wolf 2005; Resnick and Zeckhauser 2002). Yet, research on reputation signaling and its social value in the context of online communities—where reputation signals serve no direct economic value—is lacking. The lack of attention to this area is puzzling, given that encouraging new user membership and maintaining participation in online communities is the central path to gaining positive outcomes including trust, commitment, customer retention, purchase behavior, and new product adoption (Adjei, Noble, and Noble 2010; Brodie, Ilic, Juric, and Hollebeek 2013; Dholakia, Bagozzi, and Pearo 2004; Thompson and Sinha 2008). A community's success is critically dependent upon attracting and retaining members (Arguello et al. 2006; Butler 2001; Lazar and Preece 2002; Ma and Agarwal 2007; Tsai and Bagozzi 2014) and providing clear and coherent reputation information is fundamental to that success (Donath 1998).

In this research, I explore two popular types of reputation signals–one based on numerical scores (points) and one based on social categories (labels)–and investigate their impact on user participation and feelings of connectedness to the community.

Importantly, using sociological and social psychological theories, I consider how the meaning of the social category label (i.e., the degree to which the reputation signal communicates the user's role in the community) has an effect. Indeed, the information systems literature has found that providing users with a role is useful from a community design and management standpoint (Gleave, Wesler, Lento, and Smith 2009; Ransbotham and Kane 2011), but no research has explored how individuals react to different reputation types nor the psychological mechanism underlying their reactions. I also contribute to the information presentation literature by showing that the presentation of information can serve a social function, as opposed to more functional (i.e., perceptual and visual) approaches taken in past work.

Across seven studies, I conduct a series of empirical tests that contribute to the literature on the design of user reputation systems and user participation motives. First, I show that the type of reputation signal matters. Labels, which separate users into discrete and discontinuous categories, drive participation behaviors and feelings of connectedness to the community to a greater degree than points, in which reputation is represented along an infinite numerical continuum. Second, I demonstrate that the key differentiating factor between labels and points is the degree to which they communicate role clarity, which involves the presence of user roles that provide information with regard to the behaviors required of a specific role in a group or community. Third, I identify the user's tenure and level of status in the community are critical individual-level factors that moderate the positive effect of labels on user participation and connectedness to the community. Specifically, I show that when connectedness is already satiated and a need for role clarity is attenuated as it is with long-term users and high status users who have been

acclimated to and socialized in the community, the impact of labels on user participation is diminished. Lastly, I examine how two community-level features—community turnover and community interactivity—also moderate the effect. When the community turnover is greater or when the community has an opportunity to meet face-to-face, the positive impact of labels is mitigated.

In the following section, I review the literature on online communities and reputation signals. Next, I develop a theoretical model and propose a series of hypotheses that examine the advantage of labels over points, as well as the influence of each type on perceptions of role clarity, connectedness to the community, and user participation. Then, I present seven studies that test the hypotheses, including a natural experiment using field data, lab experiments, and a field experiment using real community users. I conclude by discussing the theoretical and managerial implications of this work and propose several promising avenues for future research.

CHAPTER II

THEORETICAL BACKGROUND AND HYPOTHESES

Online (or virtual) communities involve individuals joining together to communicate via an electronic platform (Figallo 1998). Traditionally, communities are conceptualized as a group of people within a certain geographic area, such as a neighborhood (Wellman and Gulia 1999). Online communities, on the other hand, exist without a physical place and facilitate interactions via computer-mediated communication (Hiltz and Wellman 1997) and are characterized by a greater degree of anonymity (McWilliam 2000). As a technology-enabled collective, online communities provide knowledge creation, collaboration, and innovation in an unconventional setting. Research on online communities has typically focused on methods to organize and govern the community (e.g., O'Mahony and Ferraro 2007), the value-creation process from functional to economic to social benefits (e.g., Armstrong and Hagel 1996), and factors that motivate existing users to contribute to the community (e.g., Wang and Fesenmaier 2003).

An online customer community is a specific type of online community that is hosted or facilitated by a brand host. The community may involve a specific product, such as an Apple iPhone or iPad in a peer-to-peer problem solving community such as Apple Support Community, or it may relate to a specific interest such as the Huggies Baby Forum where new moms discuss sleep training and pediatrician recommendations. Existing research has emphasized the business case for online communities (Hagel and Armstrong 1997), particularly regarding their ability to increase brand/product engagement, brand loyalty, product choice, trial, and adoption (Adjei et al. 2010; Brodie

et al. 2013; Mathwick 2006; McAlexander, Schouten, and Koenig 2002; Thompson and Sinha 2008). Additionally, consumers that are members of an online customer community are more motivated to assist others as well as enlist other consumers to join the community (Bagozzi and Dholakia 2006; Algesheimer, Dholakia, and Herrmann 2005). Given the clear positive impact online communities can produce in a consumer context, in this research I focus on online customer communities that are hosted and supported by a brand.

One typically joins an online customer community for one of two reasons: functional value (Furlong 1989; Jones 1995; Wellman, Salaff, Dimitrova, Garton, Gulia, and Haythornthwaite 1996) or social value (Mathwick, Wiertz, and De Ruyter 2008; Watson and Johnson 1972). Functional value involves the user joining the community to obtain advice, information, or expertise (Dholakia et al. 2004; Mathwick 2006). By contrast, social value involves seeking interpersonal connectivity. Online communities can provide social benefits including social support, friendship, and intimacy (Dholakia et al. 2004; Watson and Johnson 1972). In an online community, it is vital for its users to trust the population that will be providing advice and/or social support (Dellarocas 2003; Resnick et al. 2000). The use of reputation signals is one approach that helps users understand the community and its contributors (Dellarocas, Fan, and Wood 2003) and incorporating or changing a reputation system may stimulate social changes in the community (Zacharia and Maes 2000).

Reputation Signals in Online Communities

In the absence of directly observable behavior, reputation signals indicate the rank or position an individual holds in a group (Bierstedt 1963; Dawson and Cavell 1986; Donath 2007). In an online community, a system to indicate user reputation will be adopted to help users—both new and old—to decide whom to trust, to reward positive contributions and reciprocity, and to discourage suspect participation (Resnick et al. 2000). The purpose of reputation signals is to provide users with a social incentive to participate in the community (Shen, Hu, and Rees 2015) and indicate user reputation (Farzan, DiMicco, Brownholtz, Dugan, Geyer, and Millen 2008; Ghosh 2013). There is large variance in how communities signal user reputation in the online community setting, as reputation signals can take the form of points, labels, icons, badges, stars, and other signals or competition/accomplishment-based rewards.

Two of the most common types of reputation signals are points and labels (Dellarocas 2010). According to the HCI literature on reputation systems, both points and labels can motivate users (Farzan et al. 2008). For example, the Tactical Gamer online community uses points-based reputation signals, with each user profile including the total number of points (representing the number of comments or discussions). On the other hand, users in the PlayStation community are provided with labels, varying in name from Naughty Robot to Uncharted Explorer. Both forms of reputation signals reflect the user's contribution to the community but are presented in different ways.

Points are numerical displays of the user's contributions to the community. Points are metrics that are typically generated by either the quantity of discussions and comments in the community or the quality of the user's contributions to the community,

such as the number of times the user's contributions have been Liked or Favorited by other users. New users in the community gain points as they contribute content to the community. In the case of points-based reputation signals, the focal unit of analysis is the individual. By representing user reputation along a continuous numerical array, users are forced to make quantitative and unidimensional distinctions about the reputation of the community's members. Additionally, research on reputation systems in online marketplaces such as eBay and Amazon anecdotally suggests that "simple numerical ratings fail to convey important subtleties of online interactions" (Resnick et al. 2000, pp. 48).

Labels, on the other hand, are organized within a social system and are typically hierarchical (Owens and Sutton 1999; Sluckin and Smith 1977), such that a new user is granted a label as they join the community and are granted a new label as they participate in the community to a greater degree. In this case, the label-created group is the focal unit of analysis, such that qualitative and functional distinctions can be made between each label category. The types of labels seen in online communities can vary greatly, from clear-cut (such as the Apple Support Community's Level 1, Level 2, Level 3, etc.) to descriptive (such as New Member, Contributor, Trusted Contributor, and Caterpillar Employee in the CAT equipment online community for Caterpillar operators and professionals) to complex (such as the 23 labels featured in the AT&T Support Community including Voyager, Tutor, Curator, Historian, Guru, and Sage). Labels are often generated based on a conversion from the number of points a user has attained, such that a user in the T-Mobile Support Community will start out as Newbie Bronze (0-25 points) and may eventually rise to the top title of Super Citizen Magenta (greater than

400 points). As discussed previously, some communities feature both points and labels together to present user status, however I focus on the distinction between the two types of reputation signals in this research rather than the interactive effect.

The Effect of Reputation Signals on User Participation

I suggest that labels differ from points because labels can communicate the user's role in the community (Hogg and Abrams 1993). While labels and points may differ on other aspects (e.g., words versus numbers; I empirically test this difference in Study 2), I hypothesize that the critical difference in the online community context is the degree to which a label can convey one's role. A role is composed of a set of expected behaviors for individuals that occupy a certain position in a group or particular social category (Ashforth 2001; Forsyth 2006). Role clarity involves the presence of roles that provide individuals with information about one's place within the social system (Kahn, Wolfe, Quinn, Snoek, and Rosenthal 1964; Oakes, Turner, and Haslam 1991). Role clarity limits ambiguity around how users perceive themselves and others within the social system.

It is important to note that some labels have higher role clarity than others. For instance, labels such as Newbie/Expert/Master may exhibit greater role clarity and better illustrate the role that the user plays in the social structure than labels like Level 1/2/3. However, both types exhibit a characteristic of reputation signals that I refer to as position clarity. Position clarity is one's perception of his or her position in the community relative to others. Position clarity can be perceived via the presence of a clear hierarchy. In both of the previous examples, hierarchical subgroups or categories are created within the community. However, only in the case when the labels indicate the

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user's role in the community, i.e., have high role clarity, do I expect to see the advantage of labels over points. In fact, one could argue that points can also demonstrate position clarity (I empirically test this in Study 2), such that a user can understand that 50 points is greater than 100 and less than zero. Still, because points cannot communicate role clarity, I propose that they will not be as effective at attracting and connecting with users.

A role serves two primary functions: informational and social (Kahn et al. 1964). The informational function involves roles as descriptors of task-related behaviors that are required of the individual in a group or community (Bray and Brawley 2000), while also reducing the complexity of the social system by organizing the community's members into a set of roles (Gleave et al. 2009). For example, an Expert member of the community is assumed to provide more advice and know-how than a Newbie member. The social function of roles is to provide socioemotional clarity, personal comfort, and connections with others (Grand and Carron 1982; Kahn et al. 1964; Leary and Tangney 2005). Roles serving a social function is particularly important in this context because: 1) reputation is socially constructed (Srivastava and Anderson 2011), and 2) participation in an online community is visibly social (Joyce and Kraut 2006), involving creating discussions, posting comments, "Liking" content, etc. Indeed, considering social presence is a major design principle in computer-mediated communication design (Biocca, Harms, and Burgoon 1995; Preece and Maloney-Krichmar 2003; Shen and Khalifa 2009). When a user is provided with a role via a label such as Newbie, they not only join their fellow Newbies but also become part of the social structure that exists in the community. Roles can provide individuals with meaning about who they are and what to do in a community or group, which can deliver a sense of ease, contentment, and security (Hornsey and

Hogg 2000; Reitzes and Mutran 1994). Communities are a particularly fitting context for the development of collaborative roles (Ransbotham and Kane 2011).

When clear roles are designated in a community, it increases the likelihood that individuals will have stable, positive relationships with others (Bolton 1981; Callero 1985; Mead 1934). Feelings of role clarity create group cohesion and facilitate the sense that users are united around a central goal or group, i.e., the community (Carron, Brawley, and Widmeyer 1998). Work in sociology has found that when individuals are assigned interrelated but complementary roles in a group, they experience strong group attachment (Burke and Stets 1999). Recognizing the differences between users and their place within the social structure via labels can therefore foster a community atmosphere (Hewstone 1996; Tajfel 1981; Turner 1982; van Knippenberg 1984). By contrast, when role clarity is low, individuals feel less of a connection to the group and are therefore less likely to participate. As such, I expect that when reputation signals have high role clarity (i.e., labels), users will feel greater feelings of connectedness to the community due to feeling welcomed and accepted via the label-created category (Hornsey and Hogg 2000). Additionally, because connectedness to the community and participation are positively related (Rashid, Ling, Tassone, and Resnick 2006), I expect that when labels are used, individuals will be more likely to participate in the community (see Figure 1).

Hypothesis 1:   *User participation is greater when the user reputation is signaled via a label (i.e., high role clarity signal) than when it is signaled using points (i.e., low role clarity signal).*

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Hypothesis 2: *Role clarity underlies the effect of reputation signal type on user*

participation through feelings of connectedness.

Figure 1. Theoretical Framework.
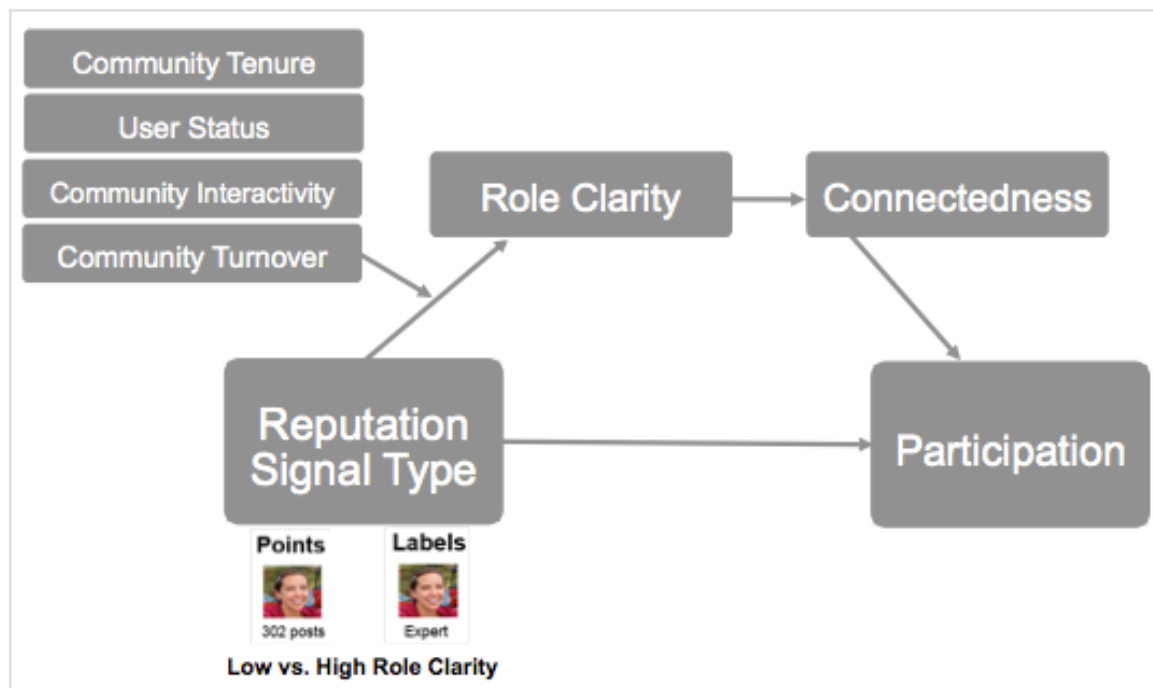
The positive effect of labels on user participation is contingent upon the assigned labels being positively framed. Indeed, research on social categorization shows that emphasizing power differentials and subordinate status can be detrimental to group success (e.g., Billig and Tajfel 1973; Georgesen and Harris 2000). If the label provides a degree of role clarity but emphasizes differences between individuals that is negative (i.e., Follower, Servant, Dictator), then the positive effect of role clarity will be mitigated. While I focus the majority of my efforts on comparing positive labels to points, I empirically test this contention in Study 2.

The Moderating Role of Community Tenure

Labels, with their high role clarity, facilitate the sense of connectedness for members in the community. However, the extent to which members rely on this cue to feel connected varies as they spend more time with the community, as does a member's need to understand their role. According to Kozinets' (1999) model of the developmental progression of members in an online community, it takes time for new users to understand the social structure of the community and to become connected. At the early stage in a new user's progression, the user will seek out topical information, but also social-emotional information about the norms and role expectations associated with the community. Specifically, gaining knowledge about the types of social interactions that are appropriate and desired in the community and the roles that other group members play are at the forefront of new member development (Kozinets 1998; Kozinets 1999). Labels with high role clarity quickly endow new users with a role in the community and generate greater feelings of connectedness to the community, which will influence greater user participation. Prior research has shown that when newcomers feel attached to the community, they are more likely to increase their visit frequency than oldtimers (Ren, Harper, Drenner, Terveen, Kiesler, Riedl, and Kraut 2011). On the other hand, existing community users already feel connected and bonded to the community (Brodie et al. 2013) and have progressed in their tenure to no longer need information about roles and the social structure (Kozinets 1999). Aligning with recent research that shows incentive hierarchies becoming less motivating over time (Goes et al. 2014), I suggest that when the user's tenure in the community increases, feelings of connectedness and one's need for role clarity are satiated and labels are no longer necessary to connect long-term users to the community.

Hypothesis 3*:*   *As the user's tenure increases, the positive effect of labels (versus points) on user participation is mitigated.*

The Moderating Role of User Status

Another user-related factor that moderates the impact of reputation signal type on user participation is the user's existing level of status. Similar to community tenure, as users become more acclimated in the community and attain greater status via participation, they gain camaraderie and connections with others (Kozinets 1999). Mathwick and colleagues (2008) compared newbies (low status) and wikis (high, coveted status) and found that wikis were more committed to the community as a result of the social value, or connectedness-related aspects, at play as a result of their long-term affiliation and status. Conversely, newbies do not have the status and experience to feel connected to others. Therefore, I propose that as a user's status increases, the impact of labels as a connectedness facilitator becomes less important. As high status members already feel connected to the community, labels will not provide an incremental boost of connectedness and thus the difference between labels and points will be negligible. However, when the user has low status and has not yet benefitted from the feelings of connectedness that accompany high status, labels will drive one's willingness to participate in the community.

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Hypothesis 4*:*   *When the user has high status (vs. low status) in the community,*

        the positive effect of labels (versus points) on user participation is

        mitigated.

The Moderating Role of Community Interactivity

Community features can also moderate the degree to which connectedness is felt in an online community and the effect of high role clarity reputation signals on user participation. Community interactivity is one such feature. Some online communities foster relationships between users strictly online, while others provide opportunities for users to also meet face-to-face. Compared to the online setting, face-to-face communication offers a richness of interpersonal contact that the electronic medium cannot achieve (Daft and Lengel 1986), building stronger social ties and connections more effortlessly (Arrow and McGrath 1994). Furthermore, users do not need high role clarity reputation signals to feel connected to one another. Therefore, I propose that in the face-to-face context, the connection facilitated via high role clarity labels is superfluous, which will minimize the positive effects of high role clarity reputation signals on user participation.

Hypothesis 5*:*   *When the community meets online and face-to-face (versus only*

        online), the positive effect of labels (versus points) on user

        participation is mitigated.

The Moderating Role of Community Turnover

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Another community feature can impact the degree to which connectedness is felt in an online community, thus impacting the degree to which labels are needed over points. One such feature is the turnover rate in the community. Some communities are stable, while others have a more temporary user base (Dholakia et al. 2004). When the community turnover of members is greater, building and maintaining connections with others is not important. On the other hand, in a more stable community, role clarity is more highly appreciated (Graen and Ginsburgh 1977), as users desire connection with others when they know that the long-term viability of the community is not at risk. As such, label-based reputation signals can strengthen feelings of connectedness when the community turnover is low, which will also enhance participation. On the other hand, when the community turnover is high, I expect the advantage of high role clarity reputation signals to be reduced.

Hypothesis 6*:   When community turnover is high (versus low), the positive effect of labels (versus points) on user participation is mitigated.*

CHAPTER III

OVERVIEW OF STUDIES

By observing a natural experiment with an online community of T-Mobile users, Study 1 demonstrates that when a community adopts labels as a reputation signal, user participation (more discussions started and more comments posted) increases over when the community used points to indicate user reputation (H1). Study 2 uses a controlled laboratory experiment of prospective community users to manipulate points and labels and finds that labels drive participation intentions due to greater role clarity possessed by labels. Labels also induce greater feelings of connectedness to the community than points and I show, via serial mediation, that role clarity and connectedness act as sequential mediators of the relationship between reputation signal and participation (H2). Study 3 shows that providing additional role information to a low role clarity label can improve participation outcomes. Study 4 examines whether the user's tenure in the community influences the effect of reputation signal type on participation intentions by implementing a randomized experimental design with members of a real online community (H3). Study 5 shows that the user's existing status in the community has an impact on the positive effect of labels on participation intentions (H4). Studies 6 and 7 further explore the connectedness mechanism by focusing on features of the community. Study 6 examines the degree of community interactivity as a moderator, while Study 7 tests how the community's level of user turnover impacts the superiority of high role clarity reputation signals over low role clarity reputation signals (H6).

CHAPTER IV

STUDY 1: CHANGING FROM POINTS TO LABELS ON T-MOBILE

Method

The data for Study 1 consist of the online community participation behaviors of

5,841 users in the T-Mobile Support Community (https://support.t-mobile.com/

community/community/). The T-Mobile Support Community is an online platform where

users discuss their T-Mobile devices and services and ask and answer questions. On July

19, 2013, T-Mobile changed their method of signaling user reputation for all users of

their online community, which created a natural experiment. This study analyzes the

differences in user participation behaviors before and after the reputation signal change.

Prior to July 19, 2013, the T-Mobile Support Community used points to display

user reputation. Points were displayed under the user's name, which was associated with

all of the discussion posts the user starts or comments on in the community.[1] After the

change on July 19, T-Mobile converted all users from points-based reputation signals to

label-based reputation signals. Users' points were converted to one of twelve labels that

are separated into three primary label subcategories: Newbie, Citizen, Super Citizen.

These label subcategories also correspond to a number (1 = Newbie, 2 = Citizen, 3 =

Super Citizen), which is displayed below the user's photo that is associated with all

discussions or comments the user makes in the community. Therefore, the T-Mobile

Support Community changed its reputation signal procedure from points to labels. See

Appendix A for before and after screenshots of the reputation signal change.

To determine how a change to the reputation signal procedure impacted actual

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[1] In a small percentage of cases, the highest performing users were also provided with a "Pillar" icon that indicated their high status in the community.

participation-related behaviors in the community, I gathered user-level data for members of the website who had created an account. Users must register for an account on the website in order to post a new discussion, comment on an existing discussion, "Like" a discussion or comment, etc. I excluded any accounts that were deactivated or were designated as employee accounts and only considered accounts that were created prior to the initial change in April 2013 in an effort to compare pre/post participation activity. I focused on changes in user-level behavior three months before (April 19, 2013 to July 18, 2013) and three months after (July 19, 2013 to October 19, 2013) the reputation signal change. I compared the number of discussions started and the number of comments posted when points were used and when labels were used to indicate user reputation by conducting repeated measures analysis. In this community, a comment is tied to a discussion in a many-to-one relationship, such that a discussion is initiated and comments follow.

Further, to find initial support for my theory that labels help to facilitate feelings of connectedness, which underlies the motivating effect of labels versus points, I studied the degree of shared language overlap between discussion and comment content. Shared language has been shown to positively influence participation in groups (Heinz and Rice 2009; Huffaker 2011). Shared language "represents a common linguistic background, in which individuals converge on a set of words including acronyms or jargon," and can be seen as a proxy for connectedness (Huffaker 2011). To quantify the degree of shared language before and after the reputation signal change, I used an open source Perl module called Text::Similarity (Pederson, Patwardhan, Banerjee, and Michelizzi 2008). Text::Similarity counts the frequency of overlapping words between two text files and is

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normalized by the length of each file. The module produces a Lesk measure of the percentage of language similarity.

Results

User-level participation behaviors. To begin, I collapsed the months contained within the before period (points) and the after period (labels). A paired samples t-test revealed that users started more discussions when the community used labels versus points (M_{Labels} = .42 discussions vs. M_{Points} = .27 discussions, $t(5840)$ = -10.83, p < .001). Additionally, users posted more comments when labels were used to represent user reputation as opposed to points (M_{Labels} = 3.29 comments vs. M_{Points} = 2.23 comments, $t(5840)$ = -3.23, p = .001).

In an effort to provide support for my contention that the change from points to labels influenced user participation, rather than simply a general increase in activity over time, I compared user participation behaviors within the before period (points) and within the after period (labels). If the change in user participation can be attributed to the change in the online community's reputation signal, then I would see no difference in the amount of discussions started or comments posted when comparing 30-day periods within the before period. Furthermore, I would expect to see continued increases in discussions started and comments posted when comparing 30-day periods within the after period. Also, I would expect to find a significant difference between discussions started and comments posted when comparing only the 30-days before the change to the 30-days after the change.

Within the before period, I compared discussions started within the first 30-day

period (April 19 to May 18) to the second 30-day period (May 19 to June 18) and found no difference ($M_{AprilMay}$ = .10 discussions vs. $M_{MayJune}$ = .09 discussions, $t(5840)$ = .60, p = .55). The number even dropped from the second period (May 19 to June 18) to the third (June 19 to July 18; $M_{MayJune}$ = .09 discussions vs. $M_{JuneJuly}$ = .08 discussions, $t(5840)$ = 2.72, p = .007). Comments posted showed no difference between the first and second 30-day period ($M_{AprilMay}$ = .75 comments vs. $M_{MayJune}$ = .77 comments, $t(5840)$ = -.16, p = .88) or the second and third 30-day period ($M_{MayJune}$ = .77 comments vs. $M_{JuneJuly}$ = .70 comments, $t(5840)$ = 1.37, p = .17) when points were used for reputation signals.

Within the after period, there was a consistent pattern of discussions increasing from the first 30-day period (July 19 to August 18) to the second 30-day period (August 19 to September 18; $M_{JulyAugust}$ = .11 discussions vs. $M_{AugustSeptember}$ = .13 discussions, $t(5840)$ = -3.46, p = .001), as well from the second 30-day period (August 19 to September 18) to the third 30-day period (September 19 to October 18; $M_{AugustSeptember}$ = .13 discussions vs. $M_{SeptemberOctober}$ = .18 discussions, $t(5840)$ = -5.18, p < .001). For comments, I found no difference in the first 30-day period to the second 30-day period ($M_{JulyAugust}$ = .91 comments vs. $M_{AugustSeptember}$ = .98 comments, $t(5840)$ = -.47, p = .64), but found an increasing pattern when comparing the second 30-day period to the third 30-day period ($M_{AugustSeptember}$ = .98 comments vs. $M_{SeptemberOctober}$ = 1.40 comments, $t(5840)$ = -3.12, p = .002).

Additionally, when comparing discussions started and comments posted 30 days before the reputation signal change (June 19 to July 18) to 30 days after the change (July 19 to August 18), I replicated the initial results such that more discussions were started (M_{Labels} = .11 discussions vs. M_{Points} = .08 discussions, $t(5840)$ = -4.33, p < .001) and

more comments (M_{Labels} = .91 comments vs. M_{Points} = .70 comments, $t(5840)$ = -3.24, p =

.001) were posted when labels were used to indicate user reputation. Overall, these results

suggest that it was the change to the reputation signal, rather than a simple increase in

activity over time, which influenced the change in user participation behavior (see

Figures 2 and 3).

Figure 2. Average Number of Discussions Started.
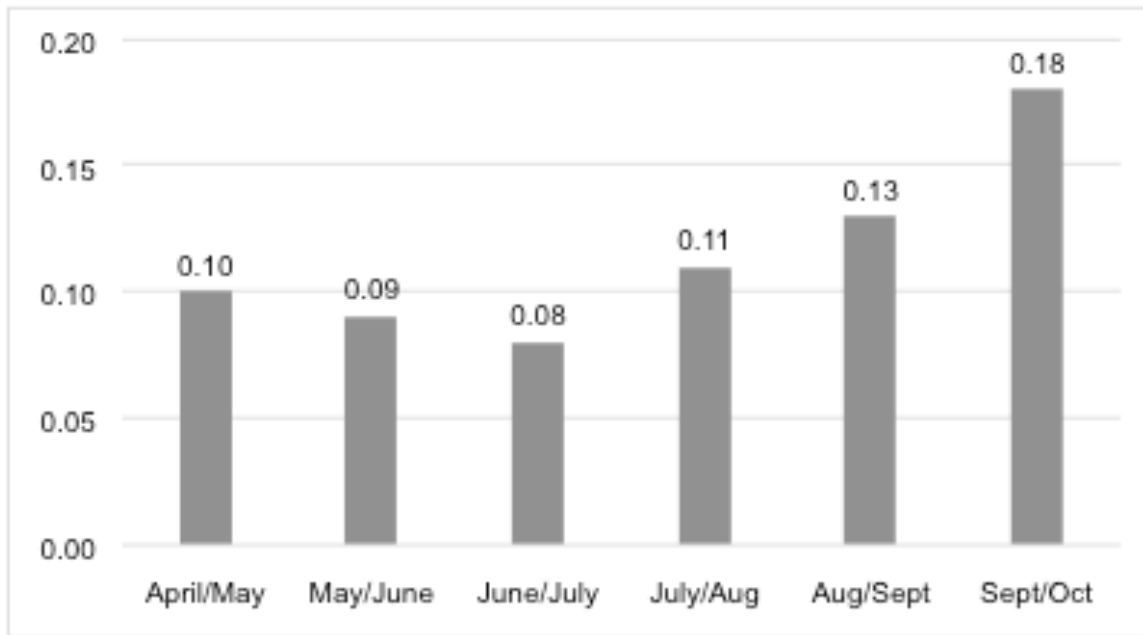
Figure 3. Average Number of Comments Posted.
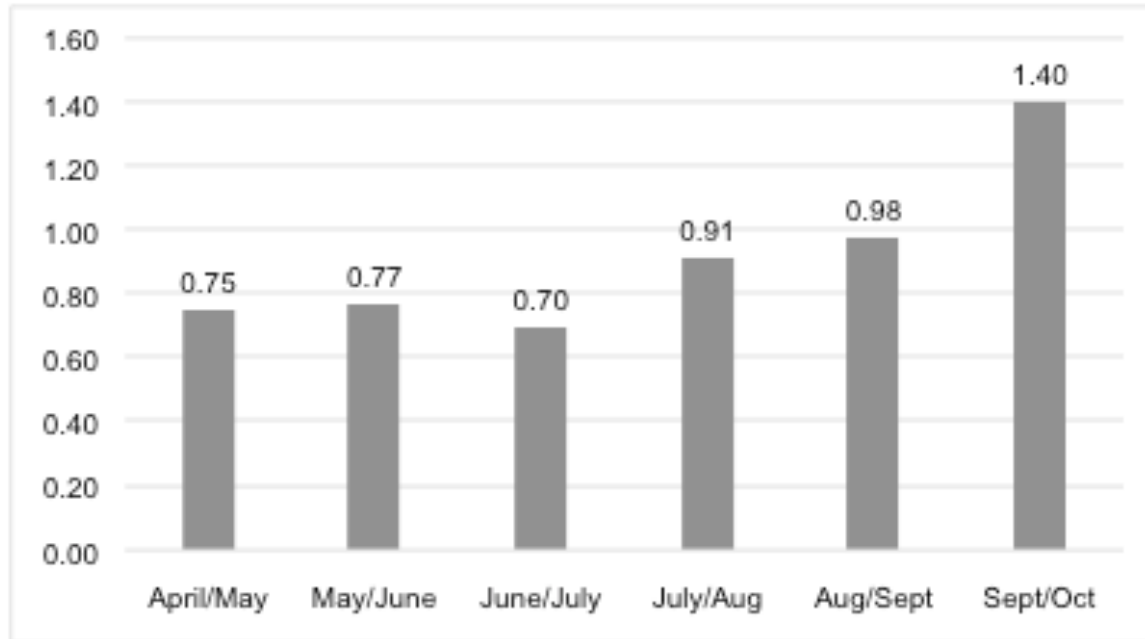
Connectedness-related indicators. In regard to shared language and considering the content of all discussions and comments, there was greater word overlap when the community used labels ($M = 32.14$, maximum $= 1,110$) for the user reputation scheme when compared to the content when points were used ($M = 30.28$, maximum $= 432$). Additionally, the Lesk measure of the percentage of language similarity also indicated greater shared language after the reputation signal change (.05% = points, .058% = labels). These results indicate a greater degree of shared language when labels were used, a proxy for connectedness among community members.

Discussion

Although it is not a controlled study, this natural experiment suggests that labels drive real user participation behavior to a greater degree than points, providing support for H1. Additionally, I provide initial support for connectedness as the psychological

mechanism underlying the positive effect of labels on user participation, as indicated by a greater degree of shared language when the community adopted labels as the reputation signal scheme.

While I am able to demonstrate that labels motivate the participation behaviors of the actual users of an online community, this study does have its limitations. Certainly, as time goes on, communities become more active. While I focused specifically on a subset of this activity for the analysis, follow-up analysis revealed limited time effects. Additionally, in the case of both points and labels, reputation signals in this community were represented numerically (i.e., the icon "1" corresponded to the Newbie title that appeared on a pop-up screen, see the Appendix A for details). Still, the label becomes dominant and salient in the subsequent case. Given the limitations of this study, the next studies control for these factors. To empirically test whether labels can drive user participation in an online community, Study 2 focuses on comparing points against three different types of labels—a label type that clearly communicates the user's role in the community, a label type in which role clarity is more ambiguous, and a label type that is negative. I propose that only a high role clarity label will result in enhanced participation intentions and feelings of connectedness to the community.

CHAPTER V

STUDY 2: THE MAIN EFFECT OF REPUTATION SIGNAL TYPE

Method

Study 2 adopts a 4-condition (Reputation Signal: Points vs. Labels (Newbie/Expert/Master) vs. Low Role Clarity Labels (Bronze/Silver/Gold) vs. Negative Labels (Follower/Servant/Dictator)) between-subjects design.

In this design, I include the two most common reputation signals and those analogous to those tested in Study 1: Points and Labels (Newbie/Expert/Master). Importantly, I also include two additional reputation signal types to rule out alternative explanations to the superiority of labels over points driving participation behaviors and intentions. First, I include a lower role clarity label condition (Bronze/Silver/Gold). The purpose of this condition is to show that categorization or grouping is not sufficient when implementing a label-based reputation system. Bronze/Silver/Gold labels do not have high role clarity (which I confirm via a manipulation check), although they have position clarity when compared to high role clarity labels like Newbie/Expert/Master. Consequently, I propose that this label type will not entice prospective users to participate in the community nor feel connected to the community due to the lack of role clarity. Second, this condition also serves to test the contention that labels are more effective because words may be preferred over numbers in certain contexts (e.g., Epstein, Pacini, Denes-Raj, and Heier 1996; Stone, Sieck, Bull, Yates, Parks, and Rush 2003). Thus, if the points condition and the Bronze/Silver/Gold condition perform similarly, then I can determine that the quantitative versus qualitative nature of the reputation signal is not the key differentiating factor between points and labels, but rather role clarity. Third, I

include a final, negative label condition (Follower/Servant/Dictator) to show that labels must be positive in order to stimulate users to participate in the community.

The survey experiment (Nock and Guterbock 2010) was administered via an online survey and participants were recruited via Amazon Mechanical Turk. A total of 126 U.S. adults (age range = 21-69, M_{Age} = 34.35, 57.9% male) completed the survey in exchange for a small payment. A three-page description of the community and its reputation procedure were presented to participants, followed by a survey that measured participation intentions, feelings of connectedness to the community, and perceptions of role clarity. The first page provided participants with a general description of the community's procedure for awarding reputation signals, such that users are provided with a reputation signal, which indicates their standing in the community. The content or purpose of the community itself was not specified in an effort to isolate the effect of reputation signal type. The second page provided examples of different user reputations in the community. It displayed what the participant's reputation ranking would look like if they joined the community but had not interacted with it yet (i.e., customizing the photo, posting comments, etc.). The third page provided additional detail about the reputation signals and stated that users gained reputation and status in the community by having their discussion or comment Liked or rated as Helpful by other users in the community[2]. See Appendix B for the full stimuli.

The reputation signal manipulation was executed on the first, second, and third page of the stimuli. In the points condition, participants were told that the community

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[2] In a pilot study of Study 2, I varied reputation signal attainment by either quantity or quality of activity, but found no interaction with reputation signal type. Therefore, I proceeded with the quality of community interactions as the way users achieve reputation signals in my stimuli.

used points to represent each user's reputation. On the second page, they viewed

examples of users with 0 points, 500 points, and 1,000 points. Finally, participants were

told that they would receive a point whenever their discussion or comment was Liked or

rated as Helpful. In the low role clarity label (Bronze/Silver/Gold) condition, participants

were told that the community uses labels to represent each user's status. On the second

page, they viewed examples of users with the labels Bronze, Silver, and Gold. Finally,

participants were told that they would receive a point whenever their discussion or

comment was Liked or rated as Helpful, which would be converted to a label. In the

negative label condition, participants viewed examples of users with the labels Follower,

Servant, and Dictator. The high role clarity label (Newbie/Expert/Master) condition

mirrored the Bronze/Silver/Gold condition, except that participants viewed examples of

users with the labels Newbie, Expert, and Master.

After viewing the information about the community's reputation signaling

procedure, participants were asked to rate their participation intentions toward the

community. Participation intentions were measured using four items (1 = strongly

disagree, 7 = strongly agree, e.g., "I would participate in this community). In addition,

role clarity was measured and averaged from three items (1 = strongly disagree, 7 =

strongly agree, e.g., "I feel like I have a role in this community") and feelings of

connectedness to the community were measured and averaged from two items (1 =

strongly disagree, 7 = strongly agree, e.g., "I feel connected to this community"). In a

pretest, I also performed a factor analysis to ensure that each construct was distinct. A

Principal Axis Factor (PAF) with Varimax (orthogonal) rotation of the items yielded a

three-factor solution (factor loadings > .7). Scale items were presented in random order.

See Table 1 for a full list of items, means, and correlations.

Table 1. Study 2 Descriptives.

	Mean	SD	Correlations		
Participation Intentions ($\alpha = .96$)	4.93	1.59	1		
1. I would participate in this community 2. I would communicate with other users in this community 3. I would consume the information available in this community 4. I would visit this community					
Role Clarity ($\alpha = .72$)	4.63	1.62	.670	1	
1. I feel like I have a role in this community. 2. People have roles in this community. 3. My role in this community is clear.					
Connectedness to the Community ($r = .92$)	4.23	1.20	.805	.708	1
1. I feel connected to this community 2. I could really belong to this community.					

Results

Participation intentions. A one-way ANOVA on participation intentions revealed a significant difference between the groups ($F(3,120) = 3.43$, $p = .019$, see Figure 4). When the community used high role clarity labels (Newbie/Expert/Master) to signal user reputation, participants were more likely to participate in the community than when points were used ($M_{Labels} = 5.57$ vs. $M_{Points} = 4.85$, $t(120) = -2.03$, $p = .047$) or when negative labels were used ($M_{Labels} = 5.57$ vs. $M_{Follower} = 4.33$, $t(120) = 3.20$, $p = .002$). Also, I found a marginally significant difference between participation intentions when Newbie/Expert/Master and Bronze/Silver/Gold labels were used ($M_{Labels} = 5.57$ vs. $M_{Bronze} = 4.98$, $t(120) = 1.69$, $p = .098$). Additionally, I found no difference between points and the alternate label conditions on participation intentions ($M_{Points} = 4.85$ vs.

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$M_{Bronze} = 4.94$, $t < 1$; $M_{Points} = 4.85$ vs. $M_{Follower} = 4.32$, $t(120) = 1.20$, $p = .23$).

Figure 4. Participation Intentions as Function of Reputation Signal Type.
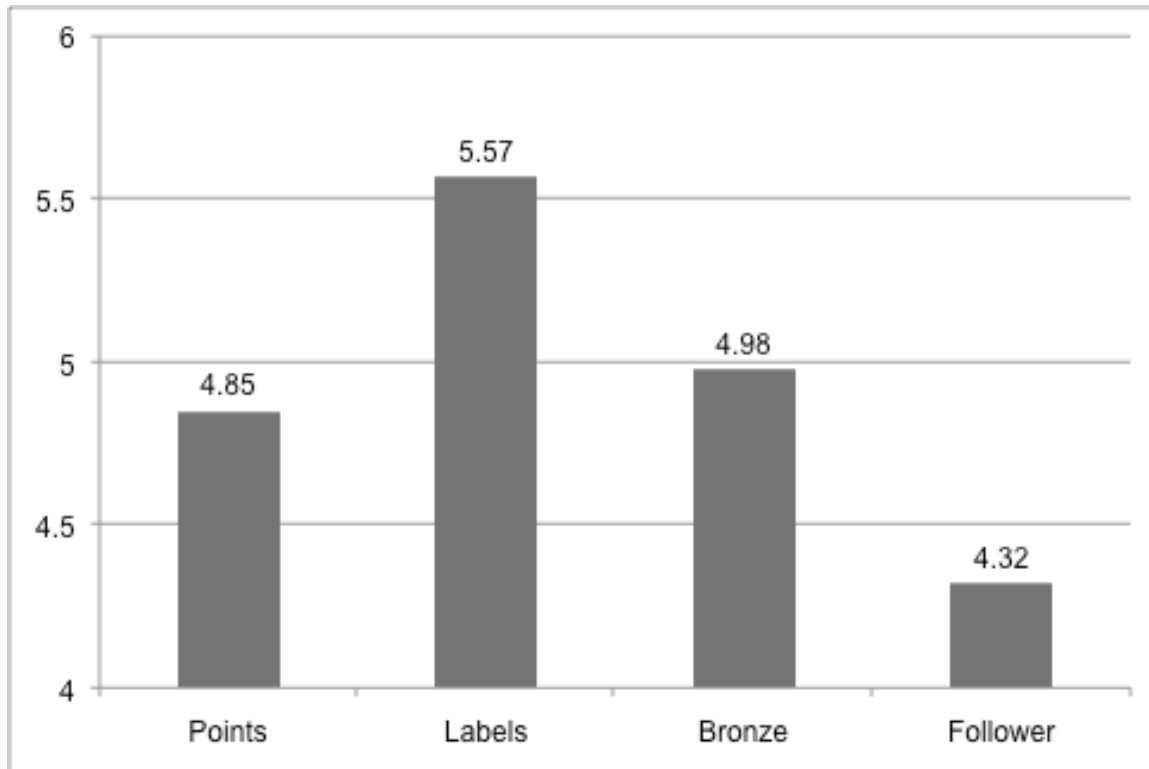
Role clarity. A one-way ANOVA revealed a significant difference on role clarity ($F(3,122) = 4.32$, $p = .006$). When the community presented user reputation in high role clarity labels (Newbie/Expert/Master), participants felt more like they had a role in the community than when points were presented ($M_{Labels} = 5.24$ vs. $M_{Points} = 4.21$, $t(122) = -3.47$, $p = .001$). Additionally, Newbie/Expert/Master labels were greater in terms of role clarity than the other label types, Bronze/Silver/Gold or Follower/Servant/Dictator ($M_{Labels} = 5.24$ vs. $M_{Bronze} = 4.59$, $t(122) = 2.20$, $p = .030$; $M_{Labels} = 5.24$ vs. $M_{Follower} = 4.49$, $t(122) = 2.56$, $p = .012$). Points and Bronze/Silver/Gold labels did not differ on role clarity ($M_{Points} = 4.21$ vs. $M_{Bronze} = 4.59$, $t(122) = -1.30$, $p = .20$), nor did points and Follower/Servant/Dictator ($M_{Points} = 4.21$ vs. $M_{Follower} = 4.49$, $t < 1$). Interestingly, I find that negative labels did not evoke perceptions of high role clarity, perhaps due to

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dissonance created by the negative aspects portrayed by each category.

Connectedness to the community. A one-way ANOVA on connectedness to the community revealed a significant difference ($F(3,122) = 7.74, p < .001$). Patterns follow the results for participation intentions. Participants felt more connected to the community when high role clarity labels (Newbie/Expert/Master) were used to indicate user reputation than when either type of low role clarity reputation signals were used, including points ($M_{Labels} = 4.92$ vs. $M_{Points} = 4.15, t(122) = -2.26, p = .045$), nor when negative labels were used ($M_{Labels} = 4.92$ vs. $M_{Follower} = 3.23, t(122) = 4.45, p < .001$). Participants reported feeling no more connected to the community when Newbie/Expert/Master labels or Bronze/Silver/Gold labels were used ($M_{Labels} = 4.92$ vs. $M_{Bronze} = 4.66, t < 1$). I found no difference in feelings of connectedness between points and Bronze/Silver/Gold labels ($M_{Points} = 4.15$ vs. $M_{Bronze} = 4.66, t(122) = -1.35, p = .18$). However, points stimulated greater feelings of connectedness than Follower/Servant/Dictator labels due to their negative slant ($M_{Points} = 4.15$ vs. $M_{Follower} = 3.23, t(122) = 2.32, p = .023$).

Mediation. I conducted serial mediation analyses using the PROCESS macro (model 6, Hayes 2013) with 10,000 bootstrapped samples. Mediation analyses showed that both perceptions of role clarity and feelings of connectedness to the community mediate the relationship between reputation signal type and participation intentions when comparing the points condition to the high role clarity (Newbie/Expert/Master labels) condition. I found the indirect effect of reputation signal type on participation intentions to be significant through role clarity and feelings of connectedness to the community (a x b = .47, 95% CI: .15, .99). The indirect effect and serial mediation was not significant

when comparing low role clarity points to Bronze/Silver/Gold labels (a x b = .06, 95%
CI: -.04, .19).

Position clarity. Some may argue that points are more precise and fine-grained
than labels given their quantitative nature, which may influence the degree to which users
are clear about their specific position in the community. To address this contention and to
delineate between the concepts of role clarity and position clarity, I measured items
related to the degree of position clarity (e.g., "My position in this community is clear").
The results indicate no significant difference between how points and labels make one's
position clear in the community (M_{Points} = 4.29 vs. M_{Labels} = 4.76 vs. M_{Bronze} = 4.46 vs.
$M_{Follower}$ = 4.27, $F(3,122)$ = 1.03, p = .38), and in fact the Newbie/Expert/Master
condition directionally shows that it is greater in position clarity than the points
condition. These findings suggest that the infinite nature of points may make it difficult
for user's to understand one's role and position in the community, given the lack of 1)
information about role-related behaviors (i.e., role clarity), and 2) information about the
range and distribution of user reputations within the community.

Negative impact of social categorization. I also measured items related to the
negative effects of social categorization (e.g., "I can tell who is superior and who is
inferior in this community") to examine whether label-created categorization makes
people feel distant from other community members. The results show that, unlike the
negative outcomes of social categorization shown in previous literature (Bales 1953;
Tajfel 1981; Archibald 1976; Lee and Ofshe 1981), there is no significant difference
between the label-based conditions and the points condition on perceptions of distance
from others (M_{Points} = 5.29 vs. M_{Labels} = 5.32 vs. M_{Bronze} = 5.45 vs. $M_{Follower}$ = 5.48, $F < 1$).

This finding suggests that, while labels are often hierarchical, the division of groups does not result in negative perceptions of individual's feeling inferior or superior to other users. This may be explained by the virtual nature of the community. Because communication is typically depersonalized (see Walther, Anderson, and Park (1994) and Bordia (1997) for exceptions) and the social value of the community is valued, hierarchy and competition may not be a primary factor (Reid 1999). In this case, labels can bring community members together.

Status pursuance. One alternative explanation for the results could be that high role clarity labels (i.e., Newbie/Expert/Master) are simply more motivating in general, such that users not only have a greater desire to participate in the community but they would also make a greater effort to pursue this type of reputation signal more than they would points. For example, perhaps the infinite nature of points is less motivating than the movement from Newbie to Expert. As such, I measured how likely participants were to pursue a reputation in the community (e.g., "I am interested in earning status in this community"). I found no significant difference in the degree to which participants were motivated to pursue status whether reputation signals were points or any label type ($M_{Points} = 4.40$ vs. $M_{Labels} = 4.80$ vs. $M_{Bronze} = 4.73$ vs. $M_{Follower} = 3.98$, $F(3,122) = 1.40$, $p = .25$). The reported results therefore suggest that individuals are more likely to participate in the community when high role clarity labels are present, but are not necessarily more motivated to pursue the reputation signal itself.

Discussion

Study 2 showed that when labels are used in an online community, specifically

labels that clearly communicate the user's role, participants were more likely participate in the community and feel more connected to the community than if points were used, supporting H1. I also empirically demonstrate that labels have greater role clarity than points, while both communicate position clarity. Role clarity and feelings of connectedness to the community indirectly (and sequentially) influence participation intentions, supporting H2. Importantly, I found that the clarity of the label matters, such that Newbie/Expert/Master labels provide greater role clarity than Bronze/Silver/Gold labels. Additionally, results of the serial mediation tests confirmed that low role clarity labels (Bronze/Silver/Gold) do not boost connectedness in the way that high role clarity labels (Newbie/Expert/Master) do.

In Study 3, I provide further empirical support for the positive effect of labels and the necessity of role clarity. In this study, I test whether providing additional role information can improve the impact of low clarity labels such as Blue/Green/Red on participation.

CHAPTER VI

STUDY 3: THE IMPACT OF ADDITIONAL ROLE INFORMATION

Method

Study 3 adopts a 3-condition (Reputation Signal: Low Role Clarity (Points) vs. Low Role Clarity Labels (Blue/Green/Red) vs. High Role Clarity Labels (Blue/Green/Red with Additional Role Information)) between-subjects design.

The study was administered via Amazon Mechanical Turk. A total of 90 U.S. adults (age range = 20-57, M_{Age} = 31.78, 66.7% male) completed the survey in exchange for a small payment. A three-page description of the community and its reputation procedure were presented to participants, mirroring the format of Study 1a. The two low role clarity conditions (Points and Blue/Green/Red) were the same as Study 1a. In the high role clarity condition, I used Blue/Green/Red labels but also included additional information about the reputation structure by adding an image of stylized figures with thought bubbles that told the participant more about each role. For example, the Red user said, "I'm New!", the Blue user said, "I Can Help!", and the Green user said, "I'm a Pro!" The stimuli was pretested prior to the full study with the same population to verify that the condition with additional information about the reputation structure evoked higher role clarity than the points condition or the Blue/Green/Red labels condition without additional information (see Appendix B for full details).

Following the scenario, participants were asked to report their participation intentions, connectedness to the community, and role clarity, as they did in Study 2.

Results

       Participation intentions. A one-way ANOVA on participation intentions

revealed a significant difference between the groups ($F(2,87) = 4.22$, $p = .018$, $\eta^2 = .088$,

see Figure 5). Respondents reported greater participation intentions when labels with

additional role information were used than when points were used ($M_{RoleLabels} = 5.75$ vs.

$M_{Points} = 4.91$, $t(87) = -2.76$, $p = .007$) or labels without role information were used

($M_{RoleLabels} = 5.75$ vs. $M_{Labels} = 5.09$, $t(87) = -2.15$, $p = .034$). There was no difference on

participation intentions when comparing the two low role clarity conditions ($M_{Points} =$

4.91 vs. $M_{Labels} = 5.09$, $t < 1$).

Figure 5. Participation Intentions as a Function of Reputation Signal Type
(Additional Role Information).
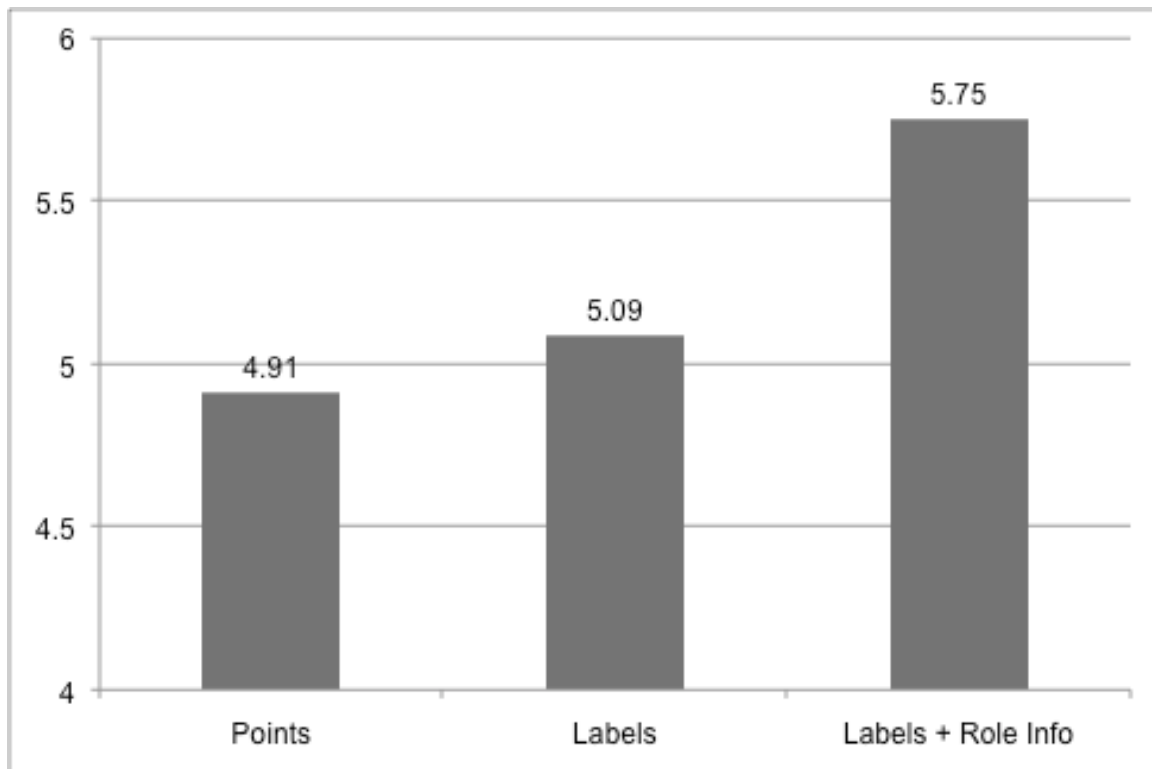
       Role clarity. A one-way ANOVA ($F(2,87) = 7.91$, $p = .001$) revealed that when

the labels provided additional information about the roles in the community

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(Blue/Green/Red labels with additional information) participants reported greater role clarity than participants in the points condition ($M_{RoleLabels}$ = 5.67 vs. M_{Points} = 4.52, $t(87)$ = -3.94, $p < .001$) or when the labels did not continue role information ($M_{RoleLabels}$ = 5.67 vs. M_{Labels} = 4.94, $t(87)$ = -2.44, $p = .017$). There was no difference in role clarity between the two low role clarity conditions ($t(87)$ = -1.45, $p = .151$).

Connectedness to the community. A one-way ANOVA on connectedness to the community revealed a significant difference between the groups ($F(2,87)$ = 3.10, $p = .050$, $\eta^2 = .083$). Patterns follow participation intentions. Greater feelings of connectedness to the community were reported when labels with role information were employed when compared to points ($M_{RoleLabels}$ = 5.33 vs. M_{Points} = 4.58, $t(87)$ = -2.25, $p = .027$) and low role clarity labels ($M_{RoleLabels}$ = 5.33 vs. M_{Labels} = 4.64, $t(87)$ = -2.05, $p = .044$). Additionally, I found no difference on connectedness when comparing the two low role clarity conditions (M_{Points} = 4.58 vs. M_{Labels} = 4.61, $t < 1$).

Mediation. Serial mediation analysis using 10,000 bootstrap samples (PROCESS model 6) showed a significant indirect effect of reputation signal type on participation intentions through role clarity and connectedness to the community when comparing points to labels with additional role information condition (a x b = .20, 95% CI: .08, .41), but not when comparing points and the label condition without role information (a x b = .14, 95% CI: -.01, .46).

Discussion

In this study, I find additional support for the importance of role clarity and show that providing additional information along with low role clarity labels can strengthen

role clarity to the positive position of high role clarity labels. I also replicate the findings

from Study 2, showing that high role clarity reputation signals drive participation

intentions and connectedness to the community more than points. Additionally, I find

further support for the serial mediation model, with connectedness to the community

underlying the relationship between reputation signal type and participation intentions.

In Study 4, I test the effect of an individual-level characteristic, community

tenure, on the relationship between reputation signal type and user participation. Because

the study stimuli in the prior study focused on individuals who would be joining the

community for the first time, Study 4 also explores the case of users who are long-time

members of the community. I conduct a randomized, between-subjects experiment with a

new sample by surveying both new and more seasoned users in a real online sports

community.

CHAPTER VII

STUDY 4: THE MODERATING EFFECT OF COMMUNITY TENURE

Method

In Study 4, I surveyed members of an online sports community called HuddlePass. The community, which features articles, discussions, and commentary about college football, was created in August 2013. I included a between-subjects manipulation points and labels as part of the community's annual user satisfaction survey. Users also reported their join date, i.e., community tenure. This field experiment allowed me to randomly assign users to points and labels conditions and determine how the user's tenure in the community factored into future likelihood of participation in a real world setting. No existing reputation system was in place prior to or at the time of the experiment.

The data in Study 4 consisted of responses to a survey sent by the HuddlePass host to its users. The brand sent an email with a link to the survey to 4,001 registered users, encouraging them to participate by offering a drawing of two $100 Amazon gift certificates to those that entered their email address at the end of the survey. Out of the total user list, 224 users completed some component of the study. I removed any users that were employees of the company ($n = 8$). I also removed incomplete responses ($n = 46$)[3], leaving 170 users that completed both the first-half questions (including the user's community tenure) as well as the second-half post-manipulation items. Therefore, 170 responses are considered in the following analysis (4.3% response rate, age range = 19-72, $M_{Age} = 39.79$, 84.7% male).

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[3]I compared the dataset with incompletes to the dataset of completes to ensure that the distribution of users along the community tenure variable was similar and that there was no apparent selection bias. The distribution proved to be very similar with frequencies within 1-2%.

The survey consisted of two parts. The first part of the survey involved questions about the users' behaviors, attitudes toward the community, their recommendation intentions, as well as an open-ended response for users to provide suggestions to the company for the community's future improvement. Of primary interest for this study was the question related to the user's timeline of membership in the community, "When did you join HuddlePass?" (answers ranging from August 2013 to March 2014).

The second part of the survey included the reputation signal type manipulation, followed by items related to future likelihood of participation, connectedness to the community, and role clarity. The reputation signal manipulation was posed as a new idea that HuddlePass was considering for future development. An introductory page told participants that the company is considering incorporating a reputation system into the website, and that their users' opinion is very important as their feedback will help the company determine how to roll out the new system in the future. Participants were also told that the purpose of the system is to reward users that interact with the platform.

The manipulation of reputation signal type was executed on the second and third pages of the stimuli. In the points condition, participants were told that the company is considering using points to represent each user's reputation in the community and that the points will be displayed under the username on HuddlePass. The points will be based on comments, new discussions, new questions, Likes, etc. that the user posts in the community. On the next page, participants were presented with an example of their reputation if they hadn't posted anything yet or for someone who is just joining the community (0 points), as well as examples of users (50 points and 100 points) that had already contributed and interacted with the website by commenting, starting new

discussions, etc. In the labels condition, participants were told that the company is considering using labels to represent each user's reputation in the community and that the label will be displayed under the username on HuddlePass. The label will be based on comments, new discussions, new questions, Likes, etc. that are posted in the community. On the next page, participants were presented with an example of their reputation if they hadn't posted anything yet or for someone who is just joining the community (Newbie), as well as examples of users (Expert and Master) that had already contributed and interacted with the website by commenting, starting new discussions, etc. Discussions with the company confirmed that both the points and labels manipulations were equally realistic and reasonable.

After reading about the new system, participants were asked to provide ratings of their future likelihood of participation, feelings of connectedness to the community, and perceptions of role clarity if the company were to incorporate the status system that was described (see Table 2). Future likelihood of participation were measured using three items ($\alpha = .78$, 1 = definitely will not, 5 = definitely will, e.g., "Given that HuddlePass incorporates this reputation system in the near future, how likely are you to log-in to the website again?"). Connectedness to the community was measured using two items ($r = .76$, 1 = strongly disagree, 5 = strongly agree, e.g., "If this system were introduced, I think this reputation system will make me feel more attached to the community"). Role clarity was measured using two items ($r = .74$, 1 = strongly disagree, 5 = strongly agree, e.g., "Given that this system was introduced, I would have a clear role on HuddlePass"). See Table 2 for a full list of measures.

Table 2. Study 4 Descriptive Statistics.

	Mean	SD	Correlations		
Future Likelihood of Participation ($\alpha = .87$)	3.42	.75	1		
1. Given that HuddlePass incorporates this reputation system in the near future, how likely are you to log-in to the website again?					
2. This system would make me contribute to HuddlePass more often.					
3. This system would make me visit HuddlePass more often.					
Role Clarity ($r = .81$)	3.27	.72	.624	1	
1. Given that this system were introduced, I would have a clear role on HuddlePass.					
2. I would play a part in the HuddlePass system.					
Connectedness to the Community ($r = .81$)	3.37	.73	.698	.524	1
1. I think this reputation system will make me feel more attached to the community.					
2. If this system were introduced, I think this reputation system can make this website feel more welcoming.					

Community tenure, the second independent variable, ranged from 1 month to 8 months (1 = August 2013, 8 = March 2014, average = 2.09, SD = 1.49). The following analysis adopts a 2 Reputation Signal Type x Community Tenure analysis, with reputation signal type as the between-subjects variable and community tenure as a continuous measure.

Results

Future Likelihood of Participation. A significant two-way interaction (Reputation Signal Type x Community Tenure) emerged for the measure of future likelihood of participation (β = -.175, t = -2.15, p = .033, R^2 = .044, see Figure 6), as well as a main effect of presentation (β = 1.38, t = 2.40, p = .018). Next, I plotted the graphs at one standard deviation above and below the mean for community tenure, such that one standard deviation below the mean indicated a user that had joined HuddlePass more recently and one standard deviation above the mean indicated a longer term user. I found that participants in the labels condition were more likely to report intentions to continue visiting HuddlePass then participants in the points condition, but only for users that were not members of the community for a long time (i.e., at -1 standard deviation on community tenure; M_{Points} = 3.30 vs. M_{Labels} = 3.74, β = .43, t = 2.15, p = .03). For users that were members for a longer period of time (i.e., at +1 standard deviation on community tenure), no difference was observed between points and labels (M_{Points} = 3.40 vs. M_{Labels} = 3.38, β = -.02, t = -.09, p > .05). Floodlight analysis using Hayes and Matthes' (2009) MODPROBE using the Johnson-Neyman technique found that the region of significance shifts at 2.46 (or approximately two-and-a-half months into the user's membership in the community).

Figure 6. Future Likelihood of Participation as a Function of Reputation Signal Type and Community Tenure.
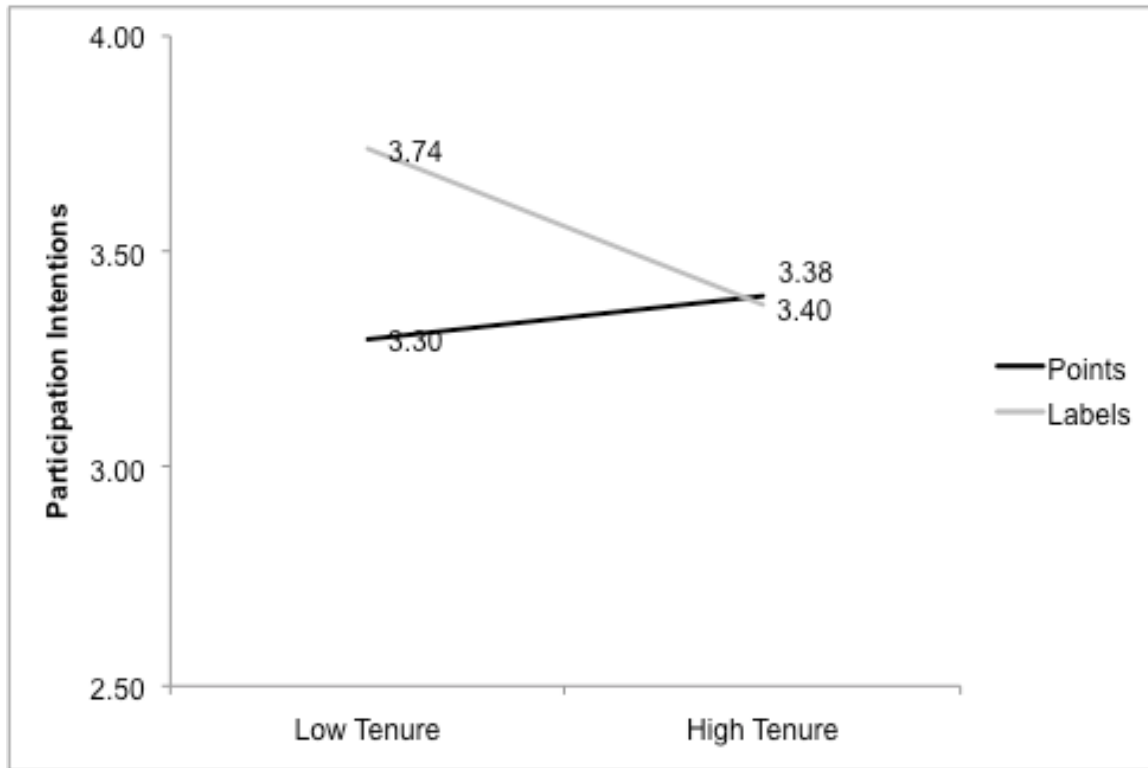
Role clarity. A main effect of reputation signal type on role clarity found that participants in the points condition reported that they felt less role clarity than participants in the labels condition $(\beta = 1.43, t = 2.62, p = .010,$ mean difference $= 1.29)$. No other significant effects emerged.

Connectedness to the community. A significant two-way interaction (Reputation Signal Type x Community Tenure) emerged for the measure of connectedness to the community $(\beta = -.189, t = -2.37, p = .019, R^2 = .063)$, as well as a main effect of community tenure $(\beta = .26, t = -2.29, p = .023)$. I plotted the graphs at one standard deviation above and below the mean for community tenure and found that feelings of connectedness were greater for new users when labels as opposed to points

were used (i.e., at -1 standard deviation on community tenure; M_{Points} = 3.15 vs. M_{Labels} = 3.69, β = .54, t = 3.83, p < .001).

By contrast, more seasoned members (i.e., at +1 standard deviation on community tenure) did not differ on their feelings of connectedness whether user reputation featured points or labels (M_{Points} = 3.34 vs. M_{Labels} = 3.39, β = .06, t = 1.77, p > .05). Floodlight analysis showed that the effect of reputation signal type on connectedness to the community moved from significant to non-significant at a tenure of 1.50 (or approximately one-and-a-half months after the user joined the HuddlePass community).

Mediation. Moderated mediation analysis using the PROCESS macro (model 8) and 10,000 bootstrap samples confirmed that the indirect effect of reputation signals on future likelihood of participation is significant through connectedness to the community for new users (i.e., at -1 standard deviation on community tenure; a x b = .39, 95% CI: .13, .62), but not for more long-standing users (i.e., at +1 standard deviation on community tenure; a x b = .042, 95% CI: -.16, .23). Additionally, I found a replication of the serial mediation in Study 2 (model 6), such that indirect effect of reputation signal type on participation intentions is significant through role clarity and community connectedness (a x b = .08, 95% CI: .03, .15) when focusing the analysis on new users.

Discussion

In Study 4, I demonstrate that new users are more likely to participate in the future if HuddlePass adopted labels as opposed to points as reputation signals. These users also reported greater connectedness to the community when labels were suggested, while labels generated greater perceptions of role clarity for both new and long-term

users. However, users with a longer tenure in the community did not vary on future likelihood of participation whether points or labels were suggested as the new user reputation scheme, supporting H3. I can easily resolve this finding with the results of the second study, such that I surveyed only incoming or prospective members and found that labels are particularly influential at driving intentions to participate. In this study, surveying actual users of an online community platform, I replicate the results for new users, but not for longstanding users.

In Study 5, I test whether the user's existing level of status in the community moderates the effect of reputation signal type on participation intentions. Similar to community tenure, Study 5 examines different types of users and their reactions to reputation signals. However, tenure and status are orthogonal constructs so it is worthwhile to explore whether they indicate the same pattern of results.

CHAPTER VIII

STUDY 5: THE MODERATING EFFECT OF USER STATUS

Method

Study 5 adopts a 2 (Reputation Signal Type: Points vs. Labels) x 2 (Community Status: Low vs. High) between-subjects design. The study was administered via an online survey and participants were recruited via Amazon Mechanical Turk. A total of 74 U.S. adults (age range = 19-62, M_{Age} = 33.43, 52.7% male) completed the survey in exchange for a small payment. A three-page description of the community and its reputation procedure were presented to participants, mirroring the structure of the stimulus used in Study 2.

The manipulation of community status was added to the last page of the stimuli. In the high status condition, participants were told that they had contributed quite frequently to the community and have developed significant expertise. In the low status condition, participants were told that they had just started commenting on discussions and starting your own discussions in the community, but hadn't yet become a key player in the community. In each condition, participants were also given an example of their high/low status in the community, such that participants in the Points/High Status condition saw 1,000 points, while participants in the Points/Low Status condition saw 5 points. In the labels conditions, High Status participants saw an Expert label, while Low Status participants saw a Newbie label. Additional details are included in Appendix B.

Following the scenario, participants were asked to provide ratings of their participation intentions, perceptions of role clarity, and feelings of connectedness to the community as they did in previous studies. As manipulation checks, I asked participants

whether they had high or low status in the community.

Results

      Manipulation check. A chi-square test of difference revealed that 89% of participants accurately interpreted the user status manipulation ($\chi^2(1) = 49.67$, $p < .001$), while 100% of the participants correctly recalled whether points or labels were used in the community ($\chi^2(1) = 65.53$, $p < .001$).

      Participation intentions. A 2 (Reputation Signal Type) x 2 (Community Status) ANOVA on participation intentions revealed a significant interaction ($F(1,70) = 6.72$, $p = .012$, $\eta^2 = .088$, see Figure 7). When participants had low status in the community, labels impacted participation intentions to a greater degree than points ($M_{Labels} = 5.47$ vs. $M_{Points} = 4.80$, $F(1,70) = 4.59$, $p = .036$). However, when participants were told that they had high status in the community, participation intentions did not significantly differ by reputation signal type ($M_{Labels} = 5.28$ vs. $M_{Points} = 5.76$, $F(1,70) = 2.32$, $p = .13$), although there was a trend toward high status users being more likely to participate when points were used in the community.

Figure 7. Participation Intentions as a Function of Reputation Signal Type and User Status.
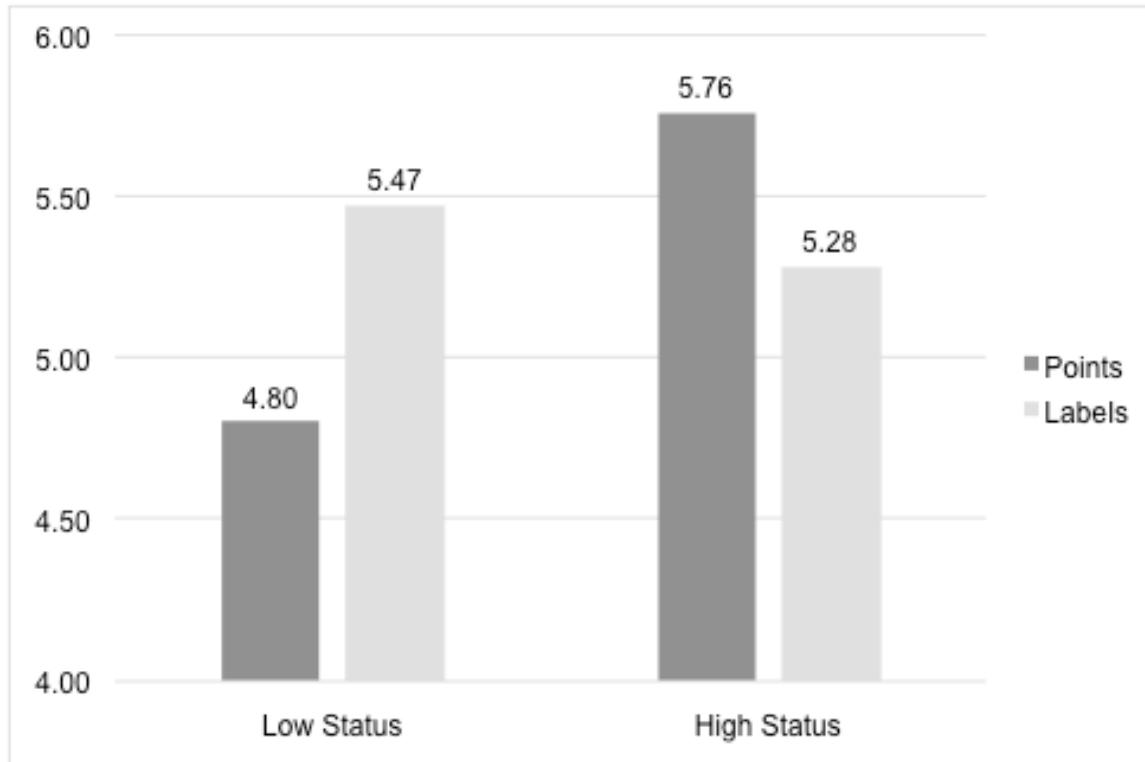
Role clarity. A 2x2 ANOVA on role clarity revealed a marginally significantly interaction ($F(1,70) = 3.39$, $p = .070$, $\eta^2 = .046$). Interestingly, I did not find a significant main effect of reputation signal type on role clarity ($F < 1$). When the user had low status in the community, they felt a sense of their role regardless of whether labels or points were used ($F < 1$, $M_{Labels} = 5.11$ vs. $M_{Points} = 4.79$). When it came to high status users, points surprisingly communicated greater role clarity than labels ($F(1,70) = 3.08$, $M_{Labels} = 4.89$ vs. $M_{Points} = 5.55$).

Connectedness to the community. A 2 (Reputation Signal) x 2 (Community Status) ANOVA on connectedness to the community revealed a marginally significant interaction ($F(1,70) = 3.78$, $p = .056$, $\eta^2 = .051$). When the user had a low status in the

community, participants reported that labels made them feel more connected to the community than points (M_{Labels} = 5.41 vs. M_{Points} = 4.52, $F(1,70)$ = 5.42, p = .023). By contrast, when the user had high status, I found no difference in connectedness to the community whether the reputation signal was points or labels (M_{Labels} = 5.30 vs. M_{Points} = 5.46, $F < 1$).

Mediation. Moderated mediation analysis using 10,000 bootstrap samples (PROCESS model 8) indicated that the indirect effect of reputation signals on participation intentions is significant through connectedness to the community in the low status condition (a x b = -.54, 95% CI: -1.32, -.13), but not the high status condition (a x b = .09, 95% CI: -.40, .46). Because role clarity seems to have less of an importance when it comes to user status, the serial mediation was not confirmed (a x b = -.08, 95% CI: -.52, .09).

Discussion

Study 5 demonstrates a user-related moderator that influences the relationship between reputation signals and participation intentions: whether the user's existing level of status is high or low. When the user has a low level of status, I replicate Study 2, such that labels generate greater participation intentions and feelings of connectedness when compared to points. I find no difference in intentions to participate in the community when the user has high status, suggesting that high status users are satiated in terms of their feelings of connectedness and do not need labels to drive connection and thus participation. Interestingly, I find that labels do not generate feelings of role clarity in this context, unlike prior and upcoming studies. Additionally, I see a nearing significant trend toward high status users being more willing to participate when points rather than labels

are used. Perhaps the context, where status is more highly emphasized, generates this inconsistent result. For example, as users gain top-level status, they reach a ceiling effect in terms of what they can attain in the community when labels are used (i.e., Master). With points, there is no such ceiling. In the case of this study, points may become more appealing and generate greater participation intentions. Study 4, which involved real users in the HuddlePass community, may not have captured this ceiling effect due to the start-up nature of the community and the fact that the distinction between low and high tenure users ranged only eight months. Given these results, additional research to tease out the difference between tenure and status should be conducted, and more positions along the user life cycle should be considered, as I address in the General Discussion.

In the next two studies, I move from user-level moderators to community-level characteristics, which managers can consider during their decision-making process, and explore whether the positive impact of labels is consistent depending on different types of online communities.

CHAPTER IX

STUDY 6: THE MODERATING EFFECT OF COMMUNITY INTERACTIVITY

Method

Study 6 adopts a 2 (Reputation Signal Type: Points vs. Labels) x 2 (Community Interactivity: Online Only vs. Online and Face-to-Face) between-subjects design. The study was administered via an online survey and participants were recruited via Amazon Mechanical Turk. A total of 156 U.S. adults (age range = 18-67, M_{Age} = 35.18, 57.1% male) completed the survey in exchange for a small payment. A three-page description of the community and its reputation procedure were presented to participants, mirroring the structure of the stimulus used in Study 2.

The manipulation of community interactivity was added to the first page of the stimuli. In the online only condition, participants were told that in this community, users join to discuss topics that interest them and help one another by providing answers to questions. In the online and face-to-face condition, participants were provided with the same introduction but were also told that several times throughout the year, the community facilitates in-person meet-ups across the country for the users to get together face-to-face. The manipulation included a photo of a recent meet-up (see Appendix B).

Following the scenario, participants were asked to provide ratings of their participation intentions, perceptions of role clarity, and feelings of connectedness to the community as they did in previous studies. As a manipulation check, I asked whether the users of this community meet online only (1) or online and in-person (2).

Results

Manipulation check. To confirm that the community interactivity manipulation was successful, a chi-square difference test showed that 93% of participants in each of the community interactivity conditions (online only vs. online and face-to-face) reported the correct condition at the end of the study ($\chi^2(1) = 120.37$, $p < .001$), while 98% of the participants correctly recalled whether points or labels were used in the community ($\chi^2(1) = 149.36$, $p < .001$).

Participation intentions. A 2 (Reputation Signal Type) x 2 (Community Interactivity) ANOVA on participation intentions revealed a significant interaction ($F(1,152) = 5.10$, $p = .025$, $\eta^2 = .032$, see Figure 8). When the community only met online, participants were more motivated to participate when the community used labels versus points ($M_{Labels} = 5.19$ vs. $M_{Points} = 4.46$, $F(1,152) = 7.74$, $p = .006$). By contrast, when the community also incorporated in-person meet-ups, participation intentions did not differ by reputation signal type ($M_{Labels} = 4.70$ vs. $M_{Points} = 4.82$, $F < 1$).

Figure 8. Participation Intentions as a Function of Reputation Signal Type and
Community Interactivity.

Role clarity. A 2x2 ANOVA on role clarity found that participants in the points condition reported that they felt less role clarity than participants in the labels condition (M_{Labels} = 4.86 vs. M_{Points} = 4.36, $F(1,152)$ = 10.26, p = .002). No other significant effects emerged.

Connectedness to the community. A 2 (Reputation Signal) x 2 (Community Interactivity) ANOVA on connectedness to the community revealed a significant interaction ($F(1,152)$ = 10.14, p = .002, η^2 = .063). When the community only met online, participants were more likely to feel connected to the community when labels were used to signal user reputation as opposed to points (M_{Labels} = 5.15 vs. M_{Points} = 4.41, $F(1,152)$ = 10.32, p = .002). However, when the community met online and in-person, I

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found no difference in connectedness to the community whether the reputation signal was points or labels (M_{Labels} = 4.75 vs. M_{Points} = 5.07, $F(1,152)$ = 1.83, p =.18).

Mediation. Moderated mediation analysis (PROCESS model 8) indicated that the indirect effect of reputation signals on participation intentions is significant through connectedness to the community in the online only condition (a x b = .64, 95% CI: .26, 1.07), but not the online and face-to-face condition (a x b = -.28, 95% CI: -.71, .070). Serial mediation analysis (PROCESS model 6) confirmed that the impact of reputation signal type on participation intentions is mediated sequentially via role clarity and connectedness in the online only condition (a x b = .38, 95% .12, .68).

Discussion

Study 6 demonstrates a boundary condition that influences the relationship between reputation signals and participation intentions: whether the community meets online or also face-to-face. When the community met strictly online, I replicate Study 2, such that labels generate greater participation intentions and feelings of connectedness when compared to points. I find no difference in the core measures when the community meets online and in-person. This finding suggests that the connectivity boost that labels provide are unnecessary when community members can connect face-to-face, supporting H5.

CHAPTER X

STUDY 7: THE MODERATING EFFECT OF COMMUNITY TURNOVER

Method

Study 7 adopts a 2 (Reputation Signal Type: Points vs. Labels) x 2 (Community Turnover: High vs. Low) between-subjects design. The study was administered via an online survey and participants were recruited via Amazon Mechanical Turk. One hundred and seventy U.S. adults (age range = 19-66, M_{Age} = 34.38, 53.6% male) completed the survey in exchange for a small payment. A three-page description of the community and its reputation procedure was presented to participants, similar to the stimulus in Study 2a.

The manipulation of community turnover was added to the first page of the stimuli. In the low turnover condition, participants were told that this community is fairly stable in terms of its members, that most people have been a member of the community for a long time, and most people who join stay in the community. In the high turnover condition, participants were told that this community is fairly unpredictable in terms of its members and members of the community come and go; they will join the community for a short time and then leave the community.

Participants were then provided ratings of their participation intentions and feelings of connectedness. As manipulation checks, I asked whether the reputation signal evoked role clarity, as well as whether the community turnover was high or low ("The members of this community typically: (1) come and go from the community, (2) stay in the community").

Results

     Manipulation check. To confirm the turnover manipulation, a chi-square test of difference found that 92% of participants indicated the correct condition ($\chi^2(1) = 123.17$, $p < .001$), while 95% of the participants correctly recalled whether points or labels were used in the community ($\chi^2(1) = 137.36$, $p < .001$).

     Participation intentions. A 2 (Reputation Signal Type) x 2 (Community Turnover) ANOVA on participation intentions revealed a significant interaction ($F(1,166) = 4.34$, $p = .039$, $\eta^2 = .025$, see Figure 9). When the community turnover was low, participants were more motivated to participate when the community used labels versus points to communicate users' reputation ($M_{Labels} = 4.88$ vs. $M_{Points} = 4.07$, $F(1,166) = 5.61$, $p = .019$), replicating the findings in Study 2. By contrast, when the community turnover was high, participation intentions did not differ by reputation signal type ($M_{Labels} = 3.85$ vs. $M_{Points} = 4.04$, $F < 1$).

Figure 9. Participation Intentions as a Function of Reputation Signal Type and Community Turnover.
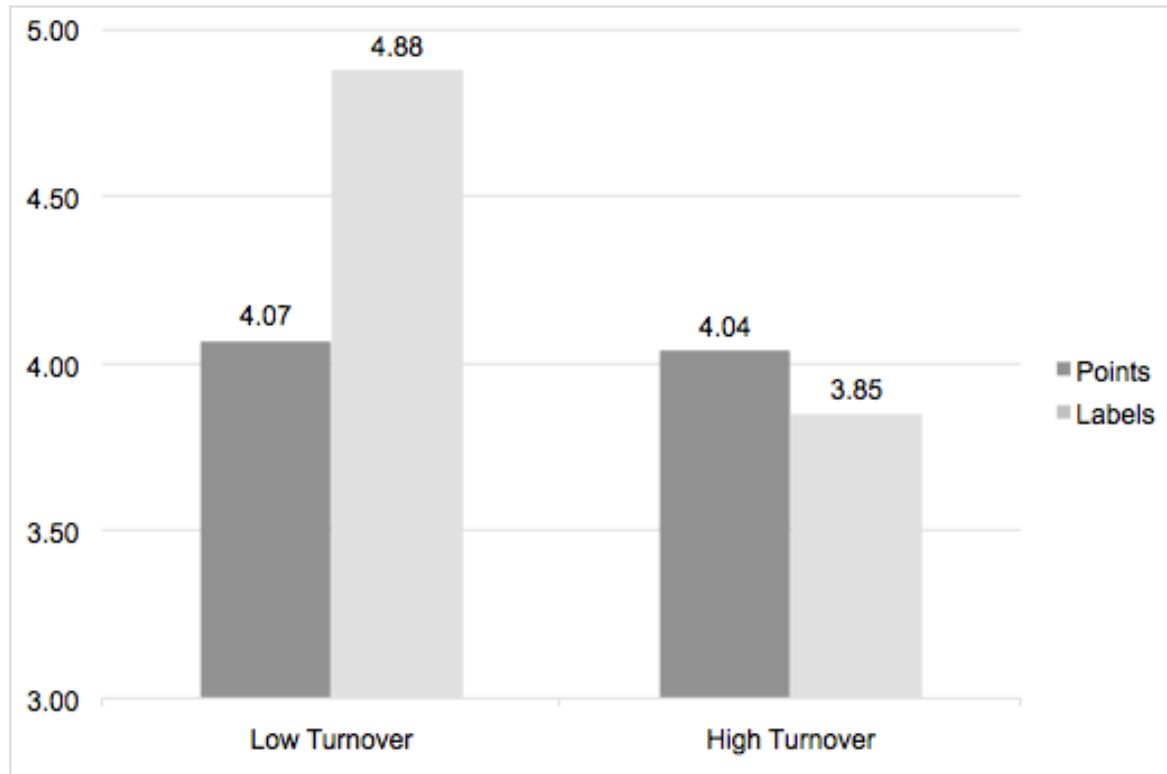
Role clarity. A 2x2 ANOVA on role clarity found that participants in the points condition reported that they felt less role clarity than participants in the labels condition (M_{Labels} = 4.70 vs. M_{Points} = 4.22, $F(1,166)$ = 6.17, p = .014). No other significant effects emerged.

Connectedness to the community. A 2 (Reputation Signal Type) x 2 (Community Turnover) ANOVA on connectedness to the community revealed a significant interaction ($F(1,166)$ = 4.28, p = .040, η^2 = .025). When members maintained their presence in the community, participants were more likely to feel connected with the community when the reputation signal used was labels rather than points (M_{Labels} = 5.12 vs. M_{Points} = 4.39, $F(1,166)$ = 6.22, p = .014). However, the community turnover was

high, I found no difference in connectedness to the community whether the reputation signal was points or labels (M_{Labels} = 4.40 vs. M_{Points} = 4.52, $F < 1$).

Mediation. Moderated mediation analysis (PROCESS model 8) indicated that the indirect effect of reputation signal type on participation intentions is significant through connectedness to the community in the low turnover condition (a x b = .44, 95% CI: .12, .83), but not in the high turnover condition (a x b = -.073, 95% CI: -.49, .31). Serial mediation analysis (PROCESS model 6) confirmed that the impact of reputation signal type on participation intentions is mediated sequentially via role clarity and connectedness in the low turnover condition (a x b = .55, 95% .11, 1.14).

Discussion

In this study, I find that high role clarity reputation signals have a more positive effect on participation intentions than low role clarity reputation signals when the community turnover is low. However, when the community turnover is high, the type of reputation signal does not matter, such that the positive effect of labels is mitigated, supporting H6. This study provides additional support for the mechanism I propose, i.e., a moderated mediation analysis shows that connectedness plays a crucial role in enabling labels to be effective, specifically in communities with less user turnover.

CHAPTER XI

GENERAL DISCUSSION

This research presents three studies that explore individuals' reactions to different types of reputation signals. First, I show, using field data for online community participants of the T-Mobile Support Community, that users participate more when labels (versus points) are used to indicate user reputation. Second, I demonstrate that labels have an advantage such that this signal type generates greater participation intentions, perceptions of role clarity, and feelings of connectedness in a laboratory experiment. Using a theoretical background in sociology and social psychological, I find that role clarity and connectedness are the psychological constructs that underlie the effect of reputation signals on user participation intentions. In addition, I utilize a randomized field experiment with a real online sports community to demonstrate that the advantage of labels over points is mitigated for users with a longer tenure in the community. I further show that user status also moderates the impact of reputation signal type on participation, such that users with low status are more willing to participate when labels are used in the community, but high status users' participation is not contingent upon signal type. Finally, I demonstrate that two community features—the degree of interactivity and the turnover rate of the community—impact the degree to which labels drive participation intentions. Specifically, I show that when the community does not meet face-to-face and when the community turnover is low do labels compel users to participate to a greater degree than points.

Theoretical Implications

From a theoretical perspective, the results of this research contribute to the information systems and HCI literatures on the importance of reputation in the online community context. While studies have confirmed that the design of a reputation system is important and that the way in which reputation is presented has an effect on user contribution behavior (Bretzke and Vassileva 2003; Chen et al. 2010; Masclet and Penard 2012), this research is the first to investigate two of the most common types of reputation signals in online communities–points and labels–and comparing the degree to which each stimulates role clarity, feelings of connectedness, and user participation. I show that in certain cases, labels are particularly effective at generating feelings of connectedness, as well as participation behaviors and future likelihood of participation, but only when the label communicates role clarity.

I shed new light on the function of role clarity as a necessary condition for the advantage of labels over points and contribute to research in the areas of e-markets and open source software that emphasize the functional value of reputation systems (Hertel et al. 2003; Lakhani and Wolf 2005; Resnick and Zeckhauser 2002). Rather, the social value of reputation signals has a significant effect on user participation. I also contribute to the literature on information presentation. While prior research has focused on the impact of visual presentations of information (i.e., graphs versus tables; Benbasat and Dexter 1986; DeSanctis 1984; Dickson et al. 1986; Jarvenpaa and Dickson 1988; Tractinsky and Meyer 1999) most commonly in managerial decision-making contexts, I show that reputation signals are another area of information presentation that needs to be explored. This research answers a call to investigate additional modes of information

presentation (Kuechler and Vaishnavi 2006).

At the same time, this research makes a theoretical contribution by extending the social psychology literature on social categorization. To date, the bulk of research on social categorization involves the effect of group categorization on intergroup discrimination and out-group bias (e.g., Allen and Wilder 1975; Brewer 1979; Dovidio, Gaertner, and Validzic 1998), but virtually no research has considered how different types of category labels can influence one's likelihood to participate in a community. I find evidence for the positive reward that social categorization offers, not only to the individual via feelings of connectedness but also to the community host by way of increased user participation. While the discussion over the positive or negative effect of social categorization continues, I find support for the positive effect of role-based social categories in driving participation behavior in the online community context. To my knowledge, this research is the first to explore the advantage of labels as a motivator for participation as well as the first to empirically examine the relationship between reputation signal type and user participation.

Moreover, I contribute to the literature on the importance of a user's tenure and existing level of status in the community as moderating factors of one's attachment to an online community (Ren et al. 2011). I show that long-term users and high status users are satiated in terms of their need for connectedness, such that different types of reputation signals do not have an effect on their intentions to participate in the community in the future. However, for new and low status users, high role clarity signals can provide the information necessary to navigate the community as well as offer connectedness more effectively than low role clarity signals, which leads to greater future likelihood of

participation. By providing clarification around what types of reputation systems are effective and when, I add to the HCI literature by showing that the implementation of labels is an online community success factor (Arguello et al. 2006; Butler 2001; Lazar and Preece 2002; Ma and Agarwal 2007; Tsai and Bagozzi 2014).

Moreover, I identify several community-level characteristics that impact when the relationship between role clarity and connectedness is more or less influential. One such characteristic is whether the community is strictly virtual or also meets in person. I show that if community members only meet online, users are more motivated to participate in the community if the community uses high role clarity reputation signals. If the community meets online and in-person, I find that the positive effect of high role clarity signals is mitigated. Another situation I examine is the degree to which the membership of a community turns over frequently or not. In this case, I demonstrate that the difference between points and labels matters only when the community turnover is low, but not when it is fleeting or temporary. Specifically, I find that in low turnover communities, where connecting with others is valued, labels lead to greater user participation than points.

Managerial Implications

From a managerial perspective, this work highlights the importance of considering reputation signals when building and maintaining an online community. This research suggests that labels have an advantage over points when the label clearly communicates the roles users play in the community, particularly for new users, low status users, and when the community meets only online and the user turnover is low.

These insights have important managerial implications, as community managers have the ability to personalize the online user experience and change the way that user reputation is emphasized or de-emphasized (Chen et al. 2010). For example, high role clarity labels as a reputation mechanism should be highlighted for new members (via community messaging, welcome emails, etc.), but can become less salient over time, i.e., as the user gain experience and status. Indeed, research on cultural adaptability indicates that dynamically changing the interface experience by user and providing personalized content is a valuable effort (Reinecke and Bernstein 2013). Additionally, I show that the type of label is critical to engaging users. Managers should then focus on integrating reputation labels that communicate role clarity. For example, the simple label structure in the Apple Support Community (Level 1, Level 2, Level 3, etc.) could be re-examined in favor of a scheme that more clearly communicates the behaviors required of each user category.

Additionally, managers should consider the aim and type of community that they administer. For example, for more temporary communities, such as those arranged around short-term events like a marathon, the community manager may spend less time considering the reputation signal type. However, for communities in which the user turnover is low, labels should be implemented to gain the greatest degree to user participation. In addition, strictly online communities should also adopt labels, while communities such as the Harley Davidson community, whose key feature involves in-person meet-ups such as the Sturgis Motorcycle Rally in South Dakota, can devote less resources to implementing the right reputation signal in their online space.

Limitations and Future Research

Although this research yields valuable insights, it is also subject to certain limitations. While I incorporate secondary data in the motivating example and survey data from real community users, the studies I report do not examine the effect of reputation signals from a longitudinal perspective. While the results with the HuddlePass community indicate that new users intend to participate if the community adopts labels, but more seasoned users have no preference, future research could investigate more cases along the user life cycle. Additionally, how do reputation signals affect lurkers, i.e., users that observe community content but do not actively participate and are estimated to be between 50 to 90 percent of a community's users (Bishop 2007; Zhang and Storck 2001)? Can reputation signals influence lurkers to become active participants? Also, I treated participation intentions as a single dependent variable. Does one type of reputation signal influence passive participation intentions (i.e., viewing content) while another influences active participation intentions (i.e., contributing content)? Future research should explore these questions.

My primary contention is that labels are successful when they have strong role clarity, as well as position clarity (i.e., hierarchical nature). Additional research could explore situations of high role clarity and low position clarity, such as labels like record keeper and fact checker. In this case, the hierarchy and position of individuals is flat and perhaps connectedness is strengthened. While the lab experiments use a very general manipulation of reputation signals without a great degree of context in an effort to maintain generalizability, future research could address how the type of community, the community's subject matter, and the community's importance moderate the effect, for

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example, whether reputation signals are more important in product-focused communities or interest-focused ones such as wedding planning communities. The social motives could be stronger in the latter case, yet there might also be a satiation effect.

Conclusion

Despite these limitations, this research illustrates the importance of delineating between the type of reputation signal as I study online communities in a variety of domains. I also show that sociological and social psychological theories can provide insights into why certain community structural features may be more successful than others. This research shows that labels are a win/win approach from both the community manager's perspective as well as the user's viewpoint. Labels can help to attract new users and sustain user participation, as well as bring users closer to the community and help them feel connected around a common purpose.

**T-MOBILE SUPPORT COMMUNITY BEFORE AND AFTER
REPUTATION SIGNAL CHANGE**

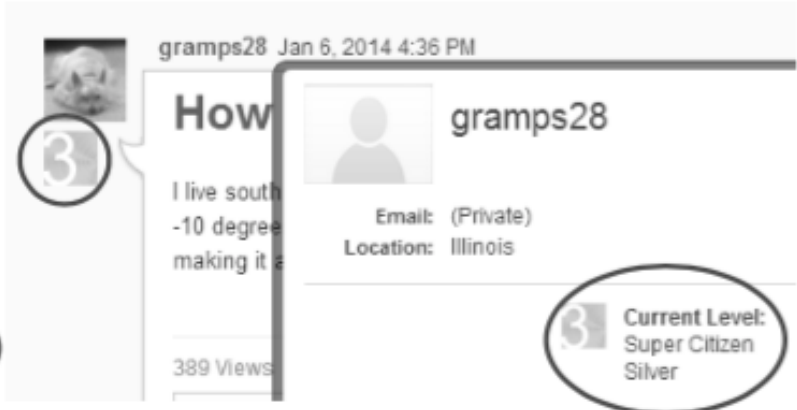**Study 2 Stimuli**

This study is about how online communities use status rankings (or reputation systems). First, we will tell you about an online community. Then, we will explain the way in which users receive status in the community. Finally, we will ask you some questions about your perceptions of the community.

Points Condition

In this community, users are provided with a status, which indicates their standing in the community. This community has chosen to use **points** to represent each user's status. The points are displayed under the user's name.

Below is an example of what your status ranking would look like if you joined the community but had not interacted with it yet (i.e., customizing your photo, posting comments, etc.).

Username

0 points

Below is an example of the other types of status rankings users may have in the community:

Username　　**Username**

500 points　　**1,000 points**

If a user posts a new discussion or comment to the community and it is **Liked** or rated as **Helpful** by other users in the community, the user receives a point.

Labels Condition

In this community, users are provided with a status, which indicates their standing in the community. This community has chosen to use **labels** to represent each user's status (**Newbie, Expert, Master**). The label is displayed under the user's name.

Below is an example of what your status ranking would look like if you joined the community but had not interacted with it yet (i.e., customizing your photo, posting comments, etc.).
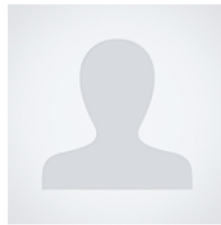
Username

Newbie

Below is an example of the other types of status rankings users may have in the community:

Username   **Username**

Expert   **Master**

If a user posts a new discussion or comment to the community and it is **Liked** or rated as **Helpful** by other users in the community, the user receives a point. When users obtain a certain number of points, they are **granted the next label**.

Bronze/Silver/Gold Labels Condition

In this community, users are provided with a status, which indicates their standing in the community. This community has chosen to use **labels** to represent each user's status (**Bronze, Silver, Gold**). The label is displayed under the user's name.

Below is an example of what your status ranking would look like if you joined the community but had not interacted with it yet (i.e., customizing your photo, posting comments, etc.).

Username

Bronze

Below is an example of the other types of status rankings users may have in the community:

Username

Username

Silver

Gold

If a user posts a new discussion or comment to the community and it is **Liked** or rated as **Helpful** by other users in the community, the user receives a point. When users obtain a certain number of points, they are **granted the next label**.

In this community, users are provided with a status, which indicates their standing in the community. This community has chosen to use **labels** to represent each user's status (**Follower, Servant, Dictator**). The label is displayed under the user's name.

Below is an example of what your status ranking would look like if you joined the community but had not interacted with it yet (i.e., customizing your photo, posting comments, etc.).
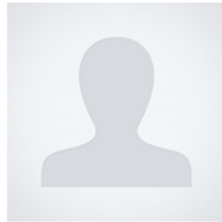
Username

Follower

Below is an example of the other types of status rankings users may have in the community:

Username

Servant

Username

Dictator

If a user posts a new discussion or comment to the community and it is **Liked** or rated as **Helpful** by other users in the community, the user receives a point. When users obtain a certain number of points, they are **granted the next label**.

Study 3 Stimuli

The image below accompanied the High Role Clarity labels condition.

Study 4 Stimuli

Points Condition

We are considering using **points** to represent each user's status in the HuddlePass community. The **points** will be displayed under your username. The **points** will be based on comments, new discussions, new questions, "Likes", etc. that you post on HuddlePass.

The **points** will reflect your current contribution. If you haven't posted anything yet or for someone who is just joining, this is what it would look like:

Sample User
0 points

If you've already contributed to the website or as you start interacting more with the HuddlePass website by commenting, starting new discussions, etc., your contribution will be reflected in the **points**. See below for some examples.

Sample User
50 points

Sample User
100 points

Labels Condition

We are considering using **labels** to represent each user's status in the HuddlePass community. The **labels** will be displayed under your username. The **labels** will be based on comments, new discussions, new questions, "Likes", etc. that you post on HuddlePass.

The **labels** will reflect your current contribution. If you haven't posted anything yet or for someone who is just joining, this is what it would look like:

Sample User
HP Newbie

If you've already contributed to the website or as you start interacting more with the HuddlePass website by commenting, starting new discussions, etc., your contribution will be reflected in the **labels**, like **HP Expert** or **HP Master**. See below for some examples.

Sample User
HP Expert

Sample User
HP Master

Study 5 Stimuli

Low Status/Points Condition

Imagine that you have **5 points** in this community as a result of your contributions to the community.

You have just started commenting on discussions and starting your own discussions in the community, but haven't yet become a key player in the community.

You

5 points

High Status/Points Condition

Imagine that you have **1,000 points** in this community as a result of your contributions to the community.

You have contributed quite frequently to the community and have developed significant expertise.

You

1,000 points

Imagine that you are a **Newbie** in this community as a result of your contributions to the community.

You have just started commenting on discussions and starting your own discussions in the community, but haven't yet become a key player in the community.

High Status/Labels Condition

Imagine that you are a **Master** in this community as a result of your contributions to the community.

You have contributed quite frequently to the community and have developed significant expertise.

You

Master

Study 6 Stimuli

Online and Face-to-Face Condition

Several times throughout the year, the community facilitates **in-person meet-ups** across the country for the users to get together face-to-face.

Here's a photo from a recent meet-up:

Study 7 Stimuli

Low Turnover Condition

In this community, there is a low degree of user turnover, meaning it is a fairly stable community.

High Turnover Condition

In this community, there is a high degree of user turnover, meaning that users come and go.

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