Encouraging Commitment in Online Communities

Yuqing Ren, Robert Kraut, Sara Kiesler

In Kraut, R. E. & Resnick, P. (Under contract). Evidence-based social design: Mining the social sciences to build online communities. Cambridge, MA: MIT Press.

Summary

Online communities depend upon a core of committed members who participate, contribute, and stick with the group. To encourage commitment, community design has to accommodate people’s motivations for being in the community and unleash the social forces that cause people to feel attached to the community, to feel responsibility for the community, and to experience net benefits for staying in the community. By designing with these social forces in mind, we can increase members’ attachment and loyalty to the community and build a committed core.

1. Introduction

Suppose you have just started an online community and recruited your first flow of visitors. You’ll want to encourage your casual visitors to participate and contribute, and you will want to cause the most desirable members to for a core of people who contribute and come back repeatedly. In this sense, you are interested in designing for commitment, for members who feel a sense of ownership and are loyal to the community in thought and action. Their loyalty could be based on their feelings of closeness to other individuals in the group, their feelings of strong identification with the group or its main interest, their feelings of obligation to the community, or even on the costs or risks of leaving the community (Festinger, Schachter, and Back 1950, Johnson 1982, 1991a; Allen and Meyer 1990; Prentice et al. 1994).

Core members of a community are likely to stay longer than anyone else (although sometimes they burn out by devoting too much time to the community). The core group is described by the power law in message distribution, indicating that a very small group contributes significantly more content than do average members (e.g., Mockus, Fielding & Herbsleb, 2002). Members of the core group often perform a large proportion of community building and maintenance work such as infrastructure maintenance, writing and reading messages, and moderating and policing the site (Butler et al., 2008).

Core members of a community are also those with the most influence on the direction of the community, conformity to its values or norms, and people’s sense of belonging to the community. From social impact theory and research (Latane 1981; Latane and Nida 1980), we can identify three factors that determine the impact of a core group. The first factor is the number of committed core members whose presence is felt in the community. The second factor is their immediacy, and the more salient their communications, the greater the impact. The last factor is the attractiveness, credibility, or felt closeness of core members to other members. The greater is this closeness, the greater the impact. These factors highlight the importance of the core group and their engagement with the rest of the community.
Studies of affiliation with offline volunteer organizations show that members who are at the peripheral of a network or who have memberships with multiple organizations are more likely to leave an organization than are core members of the group (Pearson paper in community psychology). Having a set of core members and connecting them with newer members can help community to retain the peripheral members and prevent them from leaving (see also chapter on newcomers). Arguello et al. (2006) found that newcomers to Usenet groups who received a reply from other members, especially from experienced members, were more likely to return to the group and post again. Social comparison theory (Festinger add year) states that we validate our beliefs and opinions against those of members of our social groups in order to have confidence in them. By connecting newcomers with core members, newcomers may perceive higher value in the affiliation with the online community and therefore are more likely to stick with the community and become committed themselves.

Community designers can draw from theories of commitment to make design decisions that influence whether and how people will become committed to a community. Commitment is harder to achieve than a flow (or trickle) of visitors, but for most online communities, commitment is crucial. Committed members work harder, say more, do more, and stick with a community after it becomes established. They care enough to help with community activities and to sustain the group through problems. Committed members are those most likely to provide the content that others value, such as answers to people’s questions in technical and health support groups (Blanchard and Markus 2004; Fisher et al. 2006; Rodgers and Chen 2005), code in open source projects (Mockus et al. 2002), and edits in Wikipedia (Kittur et al. 2007). Committed members are those who care about and enforce norms of appropriate behavior (Smith et al. 1997). Committed members are more likely to expand effort to maintain the community, and work behind the scenes work to keep the online community going (Butler et al. 2007). Indeed, few online communities can survive without a core of committed members, so encouraging commitment is a critical design problem.

Generating and keeping people’s commitment is not an easy design problem. Many online communities struggle to retain core members. Turning visitors into committed members requires convincing them to spend extended time and energy on your community. Even if your community is compelling, there are always alternatives in the offing, and people can easily migrate elsewhere. There are other reasons why commitment is difficult to design. Committed community members can become overly involved in community conflict, and flee out of frustration. Some feel their current community is not going in the direction they want, and they start a new group rather than try to change their community from within. Social scientists have devoted years of research into discovering the difference between commitment and flight. In the rest of chapter, we draw insights from this research to understand the forces that attract and keep people in an online community, or drive them away.
2. A Psychology of Group Commitment

Our knowledge about why and how people become committed to communities has its roots in a post-World War II theory of groups, called “field theory.” Field theory was invented by Kurt Lewin (“Le-veen”), a psychologist who emigrated to the United States when the Nazis took over Germany. Lewin was fascinated by group dynamics. He wondered what it was that caused people to follow a leader, form cohesive bodies, and instill loyalty in members of a group. Lewin rejected the idea that people’s loyalty to a group is based only in their individual personality or personal history. He observed that, in the right environment, a group could attract very strong group feelings from all sorts of people. Field theory looked to the forces in people’s environment (or “field”) that attracted them to a group and kept them loyal (Lewin 1951).

Kurt Lewin and his graduate students, such as Leon Festinger, Bernice Lott, and Roger Barker, invented ingenious laboratory experiments on group dynamics as well as methods for measuring people’s behavior in naturally formed groups. They discovered many patterns that occurred over and over again, such as the principle of proximity--how simply living or working near people initiates a sense of identity and group feelings with those nearby. They discovered various ways that a group’s autocratic or democratic management changed the group’s dynamics. Kurt Lewin’s passion for empiricism and insights into how people experienced the group environment was a major influence on the science of commitment that exists today.

Hundreds of studies later, theories of group psychology distinguish among three types of commitment that we can apply to online communities: (1) personal commitment, based on feelings of closeness and attachment to a group or members of the group, (2) moral commitment, based on feelings of rightness, or felt obligation to the group, and (3) economic commitment, based on an incentive structure in the group that increases the net costs of leaving the group. Some researchers think of these forces as adding together to determine an individual’s decision to continue membership in a group (Johnson 1982, 1991a). According to this perspective, a committed person has one or more of three subjective experiences in the group: wanting to continue as a member of the group (personal commitment), feeling he or she ought to continue (moral commitment), and feeling that he or she must continue --or at least is better off in the group than out of it (economic commitment). The rest of this chapter discusses how online community design influences each of these experiences.

3. Personal Commitment

Community designs that encourage personal commitment must address a large diversity of individual needs that bring people into online communities. Recognizing these needs is the first step in the design process.
3.1 Needs satisfaction

Hogg’s social cohesion model (Hogg and Abrams 1988, Turner 1982) argues that individuals aggregate into groups because our individual goals cannot be satisfied without participation in the group. “Thus it follows that a collection of people come together to form a group, spontaneously or deliberately, to the degree that they have needs capable of mutual satisfaction and in this sense are dependent upon one another” (Hogg 1992: p. 25). According to this perspective, people stay in a group only as long as they perceive the group and other members as being attractive and instrumental in fulfilling personal goals. Social exchange theory (Homans 1961) also emphasizes the cost-benefit aspects of social relations, and suggests that interactions continue to the extent that benefits outweigh costs. Reinforcement theory (Lott and Lott 1961, 1965) similarly argues that interaction that facilitates goal achievement or is rewarding is reinforcing and hence results in continued relationships or continued affiliation within the group.

Human beings evolved to have strong social needs that are inextricably tied to how we think and experience the social world. Online communities, like purely real world groups and communities, meet many different social needs such as a desire for information from others, a wish for help and support, a design to give to others (altruism), friendship and love, social affiliation, reputation or fame, and entertainment (Ridings and Gafen 2004). Different communities emphasize different social needs. Information exchange is common across many different online communities, but the type of information people are looking for differs radically across topics. Participants in a health support group might be interested in the side effects of medication whereas those in a hobby group might want to learn specialized skills. Exchanging social support is an important motivation in health-support and professional groups whereas recreational goals are more prevalent in multiplayer online games, and friendship or companionship is characteristic of hobby groups and social network sites.

A successful community might meet several different needs. In an active open source development community, for example, some people participate because they are trying to learn a new programming language; others want to build a software component for themselves, demonstrate to future employers their software expertise, contribute to a cause they believe in or fulfill an employer’s assignment (see Hertel et al, 2003 for an empirical study of developers’ motivations).

People can have different goals in their different communities, and in the same community, change their motivations as they learn more and participate in the group (Preece & Schniederman, 2009). Thus, people might initially join a cancer support group to get information about the disease, but they might remain because of the friends they made there or to help others who are newly diagnosed. The role of a community in a person’s life also changes with the person’s focus at the time (Ashforth & Johnson, 2001; Brewer, 2001; Brewer & Gardner, 1996). For example, a young man’s status as a cancer patient will be salient in his online cancer support group but may be much less salient when he is participating in a parent-teachers’ association meeting or interacting with a group of friends from college. His commitment to the cancer...
support group may remain strong as long as the group continues talking about relevant health-related topics. Further, it should be robust against turnover in the membership in the group. His friendships will be less affected by social context and what the group talks about, especially if the relationships on which his friendship is based cross group boundaries. Thus it should matter less what the cancer support group is discussing if the young man has personal friends in the group. Commitment to the group should be robust against drift in conversation topic. On the other hand, friendship groups are vulnerable to member turnover because friends can leave as a clique (e.g., Krackhardt & Porter, 1986).

Designers and managers of online communities therefore should understand the motivations of their members and how they want the main focus of the community to be oriented if they want to provide them experiences that meet these motivations. A program of active measurement of what people are looking for can help insure that the community provides appropriate features and experiences for its members. We elaborate this principle more below as we distinguish between identity-based and bond-based attachment to online communities, but the principle applies to almost any motivation that people have for their participation in online communities.

If you don’t know what members want, then it is hard to satisfy them. For example, even though most developers who participate in open source software development projects do so for instrumental reasons (i.e., to get better code or a better job) or for identity-based ones (e.g., to feel part of social movement they consider ideologically important), some may also want to develop friendship with other developers they meet online. To satisfy this need, some open source development projects host ‘code fests’, where developers can meet each other and form relationships. For example, The GNOME software project, a graphic desktop for the Linux operating system, hosts the GNOME Users’ And Developers’ European Conference, whose motto is ‘Meet, Plan, Party!’.

**Design claim:** Communities will be better able to retain their members if they measure and try to meet members’ different needs and desires.

### 3.2 Identity-based commitment versus bonds-based commitment

Social psychologists who study groups distinguish between two kinds of attachment to groups. One kind of attachment is a feeling of being part of the community and helping to fulfill its mission. The other kind of attachment is feeling close to individual members of the group. These two kinds of attachment represent two reasons for a person’s commitment to an online community. The person who feels attached to the community as a whole will want to be part of...
the community and to further its purpose. The person who feels attached to specific people in the
group may be more committed to these close individuals than to the group as a whole. Of course
people can feel both types of attachment in the same community, but these feelings stem from
different causes, so for purposes of design, we need to distinguish between identity-based
commitment and bonds-based commitment.

The distinction between identity-based commitment and bonds-based commitment can be traced
to Festinger, Schachter, and Back’s (1950) theory of group cohesiveness. They identified two
ways that commitment to a group is formed: through the attractiveness of the group or through
the attractiveness of individual group members. Commitment because of the attractiveness of the
group as a whole became the focus of social identity theory (Turner 1984, Hogg and Abrams
1988). This theory emphasizes how belonging to the same social category such as having the
same gender or race, or sharing the same geographic location, nationality, hobby, or interest
causes people to categorize themselves as a rightful member of a group and to identify with the
group. Having members with identity-based commitment has many interesting effects on an
online community. For example, when members feel strong identity-based commitment, they
may stick with the group even if their friends leave.

More individually-focused commitment is the type that forms when members of a community
become psychologically close to some others in the community and feel bonds of mutual liking.
This form of commitment is based upon idiosyncratic preferences and is firmly dependent on
close personal interaction (Lott and Lott 1965). If members of a community mainly feel bonds-
based commitment, then they are more likely to leave if their friends leave.

The different attitudes characteristic of those who feel identity-based commitment versus bonds-
based commitment have been demonstrated in empirical studies. Prentice, Miller and Lightdale
(1994) classified topic-based university student groups such as art groups, school newspapers,
and sports teams, as common identity groups. These are groups to which students belong more
because of the activities they do than because of individual friendship. The researchers
differentiated these groups from largely friendship or bond-based groups such as residential
units, fraternities, and eating clubs. Members of the common identity groups reported feeling
more attached to their group as a whole than to their fellow group members, whereas members of
the common bond groups reported feeling attached both to the group as a whole and to group
members. The authors argued that “the two perspectives might . . . be viewed as describing two
separable processes in the development and maintenance of groups, either of which might
dominate under a given set of circumstances” (Prentice, Miller & Lightdale, 1994: 490).

The distinction between identity-based and bond-based attachment also has been made in
studies of online communities (e.g., Postmes & Spears, 2000; Sassenberg, & Postmes, 2002; Utz,
2003; Utz, & Sassenberg, 2002). In general, common identity in the online context implies that
members feel a commitment to the online community’s purpose or topic. The following message
send by an existing member of a cancer support group to a newcomer illustrates this type of
attachment. “Welcome to the list nobody wants to join. While it really stinks to have to be here,
you'll find a wealth of experience. You'll find many excellent suggestions and tips prior to
surgery in the archives.” Common bond in the online context, in contrast, implies that members
feel socially or emotionally attached to particular members of the online community. This quote from a thank you note from one member of the cancer-support group to another illustrates the type of bond developed between the two. “Thanks for your kind words - YOU [sic] are an inspiration to me ... ! I still remember that you were the first to respond to my first post on this list, more than 4+ years ago.”

3.3 Inspiring identity-based commitment

Social identity theory (also known as group identity theory) states that people’s identification with a social group or category is a very powerful force that can keep them in a group even if they don’t know anyone in the group personally. Identity-based commitment occurs when a person feels connected to the group as a whole or its purposes, incorporating aspects of the group into their personal sense of identity or the way they think about themselves. For instance, people can become strongly committed to the Sierra Club, the National Rifle Association, a movie discussion group, a software development project or a blog community without knowing others in these organizations.

When people identify with a community or group as a whole, they tend to perceive other members in the group as interchangeable (Turner, 1985). One consequence is that their commitment to the group is stable in the face of turnover in membership, at least in comparison to bond-based attachment.

**Design claim:** Instilling identity-based attachment leads people to continue their participation in the group in the face of membership turnover.

Social identity through group categorization

Community designers can encourage people to identify with an online community or subgroups of the community by defining them as members of the same social category, and by drawing boundaries around this category (Turner, 1985; Turner et al., 1987). In traditional groups, people categorize themselves on criteria such as gender, hometown, religion, or organizational membership, or on political values or choices (Amichai-Hamburger, 2005; Postmes & Spears, 2000; Karasawa, 1991). However, a social category does not have to be meaningful in the larger population. Tajfel (1972) demonstrated that merely labeling a group with an arbitrary label (“over-estimators” or “under-estimators”) could activate common identity in research groups, even if people did not know others in their group. In other laboratory experiments as well, researchers have categorized people using group names (Michinov, Michinov & Toczek-Capelle, 2004; Postmes, Spears & Lea, 2002), uniforms (Worchel, et al., 1998), and even random assignment to a meaningless category such as “Group A” (Tajfel et al., 1971 Hogg, & Turner, 1985).

In most online communities, people have come to the group based on their shared interests in a particular domain (e.g., Perl programming), topic (e.g., autism, shar pei rescue, the Steelers), or
common cause (e.g., building a free online encyclopedia). People are attracted to the community to the extent they identify with the domain, topics or causes on which the community is based and find them meaningful. They value their membership because affiliation with the community enables them to access and share useful information, to accomplish goals that individual can not accomplish alone, or to contribute toward a meaningful cause. It is therefore important for community designers to come up with a name and a statement that clearly defines the scope and purpose of the community. Good examples are Wikipedia, “the free encyclopedia that anyone can edit,” dogster.com “for the love of dog,” or hattrick.org, whose motto “Everybody deserves their own football team,” reflects its mission as a fantasy football game. Joining a named subgroup influences the commitment and performance of participants in online communities. Kittur and Kraut (2009) demonstrated that when Wikipedia editors joined a named project within the larger encyclopedia, they increased their overall editing in the encyclopedia and directed more of their editing to work that was within the scope of the project they joined.

**Design claim:** Providing an online community a clear mission statement that reflects the shared interests of its members will increase the members’ commitment to the community.

Once people have identified with a community, this sense of identity can be very powerful in determining their commitment, especially when the group also has a distinctive ideology and way of thinking. People can become strongly committed to a political party or religion without knowing any other members. However, as the community grows, members may start to cluster into natural subgroups. Subgroup identity can be as powerful as community identity in eliciting commitment, and to further this process, designers can actively promote or create subgroups. In one experiment in an online setting, Beenen et al (2004) increased contributions to an online movie site by telling people that they were members of the fictitious “Explorers’ group” and then assigning the Explorers a group goal. Yet people who thought they were Explorers and contributed 65% more when given a group goal than when they were given a comparable individual goal. Ren et al (under review) created subgroups among people with similar movie tastes within a movie community, giving them arbitrary names like the Eagles or Gorillas. Creating these subgroups increased members’ self-reported commitment to the overall community and increased their frequency of visiting the site over a six month period by 44%, compared to other participants who were not assigned to subgroups.

**Design claim:** Creating named groups within a larger online community will increase members’ commitment to the subgroup and increase contributions that benefit the community as a whole.

Although we advocate subgroups to increase identity-based commitment, such groups have to be designed carefully so as not to interfere with commitment to the community as a whole. Many communities organize subgroups around the general theme of the larger community to complement rather than supplant the overall community purpose, for instance, sharing a particular type of picture in Flickr. The introductory pages of Wikipedia, the online encyclopedia, say, “You can help build Wikipedia into a better encyclopedia and wiki community by editing and creating new articles” (www.wikipedia.org). The community creates sub-goals in the form of collaborations, challenging members of the community to work on an
article or a topic for a defined period of time to improve its quality or scope. It uses communal Wikipedia jargon and provides metrics that show the extent to which the community is achieving its goal (e.g., “we are currently working on 851,516 articles”). It also provides the community’s history and highlights competition with other encyclopedias, such as the Encyclopedia Britannica.

However, like member growth in the community at large, subgroup growth can overwhelm people. After Flickr.com introduced its group feature, for instance, invitations to join groups arrived in members’ inbox at such a large volume many members inquired about ways of ignoring or stopping the invitation spam. In comparison, Facebook made a decision to forbid mass-messaging.

Some subgroups are more compatible with bond-based communities than they are with identity-based ones. These are designed specifically to support subgroups of friends. For example, social networking sites like Friendster, MySpace, and Facebook encourage members to invite others to join (e.g., “Friendster is fun on its own, but it’s even better with friends”) and provide tools to make the invitations easier to issue. The introductory pages on Myspace.com encourage members to “Start viewing your friends' profiles. Learn their interests, read their online journals, and view their pictures. Browse through everyone's Friends List and see whom you are connected to. . .[I]nform your circle of friends with info on current events, or start an organization or group with people that share the same ideas as yourself.”

**Design claim:** Identification with subgroups may not readily transfer to identification to the community as a whole. When designers define the goals of subgroups to complement and be consistent with community goals, these groups can increase identity-based or bond-based commitment.

Common goal or fate

A common goal in a community is a goal that the group as a whole can attain, such as a high score (Postmes, et al., 2001), ratings, or some tangible outcome. A common purpose encourages people to feel a sense of identity in online communities. Online communities that build open-source software (e.g., http://www.apache.org/) or online reference books (e.g., http://en.wikipedia.org) have an interdependent task and common purpose that focus motivations on the community as a whole. Bryant, Forte and Bruckman (2005) describe how the common goal of developing the world’s best encyclopedia led readers of Wikipedia to become “Wikipedians,” active contributors committed to the community and its goal. As three Wikipedia participants remark:

“I really got inspired by the idea [of the Wikipedia]. I’d say a lot of what hooked me was the community aspect and knowing that I was contributing something that was going to be around for a while. . .”

“I believe in the integrity of the project. I want to see it succeed, especially the articles people will look up. . .“
“It has a dedicated task and it’s producing a product… at least with the Wikipedia [versus Usenet and the like] you can convince yourself you’re doing something to benefit mankind…”

Guilds in online game environments often identify their group goals in their profiles. Lords of Eternity declares, “Our goal is to defeat current raid content and work towards the heroic hard modes and meta-achievements as efficiently as quickly as possible. We strive for 5-night progress on a 3-night schedule.” In contrast, the ||PvP|| guild says, “Unlike most guilds, we are not about running dungeons or farming monsters. We are dedicated [to] battling the horde and paving a knee deep path of corpses on our journey to epic PvP armor and weapons.” Like many guilds, both of these tally their achievements and progress towards their goals on their guild websites.

Another example of common goals and their effects on commitment can be seen in political subgroups on Facebook, whose members share the mission of getting their candidate elected. These include the John McCain Facebook Challenge group, whose mission was to “Get every Republican on Facebook to go to John McCain's Facebook page … and become a supporter” and the largest Facebook group for then-candidate Barack Obama, whose “One Million Strong for Barack” embodied its mission.

Common fate is the perception that all community members either benefit from the same reward, or suffer from the same costs (Michinov et al., 2004; Worchel et al., 1998). For example <need online community examples here>

**Design claim:** Making community goals or fate explicit will increase members’ identification with, and commitment to, the community.

Describe research showing there is greater likelihood of identifying with a successful group than an unsuccessful one. NOTE from Sara: I do not find evidence for this claim. There are studies showing that when people identify with a group, its success or failure influences their own self esteem. I have not been able to find evidence that success and failure directly affects identity. Sometimes failure increases identification with the group, for example—as when people blame an outgroup and get their “backs to the wall”

**Design claim:** Publicizing the extent to which the community or its groups have accomplished its goals will increase the members’ attachment to the community.

Out-group presence and intergroup competition

The very concept of a group implies one or more contrasting groups. People who define and categorize themselves as

---

Who are the Horde and Alliance? The Horde and Alliance are the two sides battling for control of the world. In years past, they fought brutal wars against each other, but today, they have settled into a tenuous stalemate. … Still, the Horde and Alliance are hostile to each other, and members of one faction are never welcome in the cities of the other.

Figure X: What are the Horde and Alliance in World of Warcraft (http://www.worldofwarcraft.com/info/faq/hordevalliance.html)
members of a group often compare themselves with those in other groups (Hogg & Terry, 2000). Making these contrasts explicit can intensify people’s identification and commitment to their own online community and increase their felt competition with other communities.

In experiments, researchers have divided participants into two or more groups to highlight group boundaries. Doing so intensified participants’ identification with their own group (Postmes et al., 2001; Rogers & Lea, 2005; Worchel et al., 1998). The out-group did not have to be physically or even virtually present to elicit intergroup comparisons and in-group commitment (Utz, 2003; Yuki, Maddux, Brewer, & Takemura, 2005).

In online communities, designers can encourage members to attend to group boundaries and their identification with the group by increasing members’ awareness of a different “outgroup.” For example, postings on the Frequently Asked Questions (FAQ) page on apache.org compare the speed, performance and market-share of the Apache server with those of other commercial servers, fostering the common identity of those who work on Apache software. The Wikipedia project site uses a similar technique by highlighting competition with other encyclopedias. The authors of the entry on Wikipedia itself noted that Jimmy Wales, the founder of the project, “intends for Wikipedia ultimately to achieve a ‘Britannica or better’ level of quality and be published in print” (Anonymous, 2006). Blizzard, the developer and operator of World of Warcraft, built comparisons at the core of their game by requiring that each player choose between being a member of one or the other of the opposing factions, The Alliance or The Horde. Also, guild-level rankings in World of Warcraft and other group-oriented online games building increased identification by highlighting the presence and threat of an outgroup.

**Design claim:** Highlighting (or blaming) an outgroup will increase commitment of members.

The power of an outgroup to intensify group commitment is enhanced when people already feel connected to the group and perceive their group to be threatened (e.g., Hutchison et al, 2006). The surge of American patriotism after terrorist attacks on the World Trade Center and Pentagon illustrate this point. Some citizens reacted with anger, and some with sadness, but both groups increased their commitment to the United States. Research suggests that failure or threat is especially likely to strengthen commitment to a community when they come from external sources or can be overcome with collective effort from group members (Lott and Lott 1965). This is why many political leaders prefer to blame other countries for problems in their own.

Community designers must be careful of when highlighting a threat to a group vis-à-vis some outgroup, because the effects of threat can backfire. In general, research shows that people prefer to stay with a group that is successful or has high status (Hinds paper, Lott and Lott 1965). Moreover, core and peripheral members may respond to failure and threats differently – core members to strengthen their attachment to justify the additional effort they exert to overcome the difficulty whereas peripheral members are more likely to leave the group when it is an option. When leaving is not an option, in the face of threat both core and peripheral members, will identify more strongly with the group (add reference from community psychology).
**Design claim:** Emphasizing a threat to the group from an external source will increase the commitment among core members, but may undermine the commitment of more peripheral members. These members may leave to the extent that they have alternative communities.

Similarity to the community

Similarity can create identity-based as well as bonds-based attachment. Similar member background such as profession, school, locality, race, ethnicity, occupation, and age, especially when these attributes are shared among people who are otherwise strangers, may lead to common category membership. Further, people tend to dislike groups whose members are heterogeneous, and these groups experience high turnover, especially when conflict arises (Williams & O’Reilly, 1998). Similarity of background or expertise leads to common identity most when the similarity is relevant to the group's context and functioning (Cartwright, 1968).

Whether similarity leads to identity-based or bonds-based commitment depends upon its how people’s similarity to the community is described (Tajfel and Turner 1979). When similarity is presented as common social category or shared attributes of group members or “group prototypicality” (e.g., love of sports or movies), it triggers identity-based attachment with the target being the group and its fellow members being completely interchangeable.

Familiarity with the community.

In research on how experience affects people’s commitment, Zajonc (1968; 2001) demonstrated that the more familiar one is with anything, whether objects, music, or people, the more one likes it. This phenomenon is called the “mere exposure effect.” It is pervasive although often unconscious. Other things equal, people like hip hop music or Impressionist painting the more often they hear or see them. They like olives, beer, and tofu more, the more often they taste them. They like acquaintances better the more often they run into them.

In online communities with a goal of fostering identity-based commitment, making the community and its activities repeatedly visible to members should increase their liking of the community. Many online communities provide a constant stream of updated information about the community and groups within the community. For example, in Wikipedia, the “my watchlist” feature shows editors changes to pages in which they have expressed an interest.

**Design claim:** Displaying information about the group and its recent activities will promote identity-based commitment.

Anonymity

Generally, anonymity of individual group members fosters community identity and strong group norms because it de-emphasizes individual distinctions. By contrast, making personal identity salient or individual members identifiable increases common bond-based attachment and weaker group norms (Postmes, et al., 2005; Postmes, 2001; Sassenberg, 2002; Sassenberg & Boos, 2003; Sassenberg & Postmes, 2002). Postmes and Spears (2002) compared the influence of group
norms in common-identity versus common-bond online groups. They found that attitudes were more similar in common-identity groups than in common-bond groups. Sassenberg (2002) found similar results using a behavioral measure of compliance to group norms. Thus research so far indicates that online community members who feel identity-based attachment to the community will be more likely to conform with group norms than those who feel bond-based attachment to the community.

**Design claim:** Making group members anonymous will foster identity-based commitment.

### 3.4 Bonds-based commitment

People may become committed to a group by developing a connection to the people who comprise the group. In this case, their commitment is not necessarily to the group as a whole but rather to the other members they know and like. Gross & Martin (1952, pp. 553–54), in their discussion of bonds-based commitment, talked about group cohesiveness as “the resistance of a group to disruptive forces” and proposed that such cohesiveness is associated with the strength of the relational bonds among group members. Similarly, Lott (1961, p. 279) defined cohesion as “that group property which is inferred from the number and strength of mutual positive attitudes among the members of a group.”

It follows from this perspective that interventions that increase interpersonal attachments to other members of a community will lead to greater group cohesion and personal commitment. One technique to accomplish this kind of commitment is to recruit people who are already friends as members of the community.

Backstrom and his colleagues (2006) showed that the likelihood that a person would join a group in the social networking and blogging site livejournal.com increased with the number of the people they were linked to who were already members of that group. Many online communities do recruit among friends, for example, by mining current members’ email lists. Facebook suggests “friending” people with common network ties. Doing so not only increases the likelihood that a newcomer will join a community, because it is frequented by friends, but also increases the mutual bonds among community members that will keep old-timers returning to the site.

**Design claim:** Recruiting participants who have existing social ties to be members of...
Building commitment

*the community will increase their commitment to the community.*

Another technique to foster bond-based attachment is to build features into the community that build and maintain friendship among participants. Although psychologists have extensive theories about the factors that lead to interpersonal attachment (see xxx for a review), here we concentrate on factors that can be influenced by community designers and that have robust effects on interpersonal attraction: — repeated exposure, similarity, social interaction self-disclosure.

Familiarity with other people

As Milgram’s discussion of the familiar stranger (1977) suggests, merely seeing other people in an online group repeatedly, even without communicating with these others, may be a precursor to forming a personal attachment to them. When applied to the challenge of increasing bond-based attachment to an online group, the implication is that designers should make the identity and behavior of the participants in the group known to each other. Seeing pictures of other people or even their avatars increases attraction, especially when people are just getting to know each other (Walter et al, 2001; Yee et al, 2007). Providing a stream of fresh information about the others enhances this familiarity effect.

Facebook does an excellent job of leveraging these principles. The home page of many groups features a selected set of members, recent discussion posts, and photos, videos, and links shared by members. Even applications on Facebook are surrounded by pictures of users and fans. These images increase the likelihood that people will form an attachment to another member, even if they originally joined just to play a single-person game. (See Figure X, showing the use of pictures of people to build attachment to the single-player game Tetris.)

Facebook incorporates the familiarity principle into its core features, such as its “what’s on your mind” news feed and wall features (See Figure X). The typical homepage on Facebook.com shows frequently updated information and a constant stream of comments, videos, and activities of friends, continually reminding...
users of their friends’ existence. Through these techniques, Facebook helps to build and maintain the bonds among friends and through this route keeps users attached to Facebook itself.

**Design claim:** Displaying information about individual members known to the focal person and their recent activities will promote bonds-based commitment.

Social interaction

Social interaction is the primary basis for building and maintaining social bonds. The experience and familiarity we gain through social interaction with others increases our liking for them (Homans, 1951). Conversing with people and doing things with them provides opportunities for people to get better acquainted and to build trust. As the frequency of interaction increases, their liking for one another also increases (Cartwright & Zander, 1953). Some studies have discovered an approximately linear relationship between liking of group members in small groups and frequency of interaction with them (Lott and Lott 1965).

In online communities, members’ frequency of interaction with others is a major determinant of the extent to which they build relationships with one another (McKenna, Green, & Gleason, 2002). More exchanges among community members, through private messages, for example, provide opportunities for members to create liking and trust. Utz’s (2003) study of MUD players showed that the longer their involvement in the MUD and the more real-world contact they had with other members, the more they felt a bond with other players. Interpersonal connections become even stronger if members have a sense of virtual co-presence or a subjective feeling of being together with others (Slater, Sadagic, & Schroeder, 2000).

Although most online communities provide mechanisms for public communication through distribution lists and forums, only a few support the private or semi-private communications that build strong interpersonal bonds. Examples of such features include the private email and instant messaging features in MySpace, easy-to-create private chat-rooms in America Online, the “Whisper Command” in LambdaMoo, and chat bubbles or scrolling bars in immersive games and play communities.

**Design claim:** Providing opportunities and multiple channels for members to engage in personal conversation will increase bond-based commitment in online communities.
In offline environments, physical proximity is a major determinant of the frequency of people’s communication. For example, students tend to form closer friendships with those they sit next to in class (Sykes et al, 1976) and are more likely to marry people who live in the same neighborhood or go to the same school (Bossard, 1932). Propinquity has been reported as a reliable predictor of interaction, interpersonal attraction, and close bonds in many natural settings, such as boarding schools, college classes, large corporations, and housing projects.

Designers create virtual propinquity by clustering or guiding individual members into virtual neighborhoods such as islands in Second Life or guilds in multi-player games. In addition, designers seeking to support interpersonal bonds can provide ways for community members to visualize the online social networks that they have with each other, and to connect with friends’ friends. Social networking sites like Facebook and LinkedIn allow members to view their friends’ networks and show their mutual friends. Visualizations of the friend networks among community members could help to build ties among of friends-of-friends by helping people fill in gaps.

**Design claim:** Creating virtual neighborhoods and ways of visualizing other members will increase the likelihood of felt co-presence among members and the likelihood of their building bond-based commitment.
Example 2. Linked In gives a job advertiser a sense of social connections.

Personal information and self-disclosure

Opportunities for self-disclosure—the exchange of personally revealing information—are both a cause and a consequence of interpersonal attraction (Collins & Miller, 1994). Accordingly, members of online communities are more likely to form relationships if they have opportunities to self-disclose and learn personal details about each other. Opportunities for self-disclosure shift attention from the group as a whole to individual members (Postmes et al., 2002; Sassenberg & Postmes, 2002).

In online communities, tools for personal communication including email, texting, chat rooms and instant messenger, allow for self-disclosure and social interaction out of the public view, where people feel safe. Tools that show who is currently online and what they are doing also may help people gain and maintain a sense of others and their habits. In addition, many communities offer user profiles with personal information such as photos, background, experience, and interests that helps members know more about the people in the group. Some communities even allow people to append a personalized signature or an avatar to their postings. These personalized options can signal a member’s style and personality.

There is some evidence that personal information promotes interpersonal bonds even among people who have not yet interacted (Walther, 2001). In a clever experiment, Jeff Hancock showed a study participant another person’s online Facebook profile; those who saw another’s profile liked that person significantly more than those who had not seen the profile [cite study, CSCW 08]. Personal information not only can increase people’s liking for others, but also increases their likelihood of interacting with them. It also increases their ability to choose people.
they will trust and like. Knowing others’ home towns and current residences enables members to identify those who live in the same region. They can then become real-life contacts. Likewise, the inclusion of contact information such as phone numbers, email addresses, and IM accounts enable members to connect and interact through multiple channels. Yuki et al. (2005) found that people were more trusting of those who knew they had a shared acquaintance among their in-group members. A friend’s friend was a friend online.

In a field experiment with a real life movie discussion community, we found that members with access to individual profiles with information about others’ history, location, and movie preferences visited the site more frequently than those that did not have access to individual profiles (Ren et al. 2009). For individual profiles to lead to commitment, however, designers need to be thoughtful about what fields to include and what information to encourage. For example, at professional social networking sites like linked.com, it is more meaningful to include fields related to people’s professional experiences such as education and work experiences whereas at movie discussion site like flixster.com, it is more meaningful to include fields related to people’s movie tastes.

**Design claim:** Providing user profile pages and flexibility in personalizing user profiles so that people can reveal their unique experiences or characteristics and sharing of personal stories will increase bond-based commitment.
| Category    | Score | Match |
|-------------|-------|-------|
| Blockbusters| 9     | Bad   |
| Comedies    | 11    | OK    |
| Action      | 12    | Good  |
| Love        | 12    | Good  |
| More Stuff  | 8     | Bad   |

### Blockbusters

| Movie                                      | You      | Nikhilesh Krishnan | Match           |
|--------------------------------------------|----------|--------------------|-----------------|
| Titanic                                    | ★★★★★★  | ★★★★★★            | Bad             |
| The Lord of the Rings - The Return of the King | ★★★★★★ | ★★★★★★           | Good            |
| The Chronicles of Narnia: The Lion, The Witch and The Wardrobe | ★★★★★★ | ★★★★★★ | Exact           |
| Harry Potter and the Goblet of Fire        | ★★★★★★  | ★★★★★★            | Consider Divorce|
| Star Wars: Episode III - Revenge of the Sith | ★★★★★★ | ★★★★★★ | Hmm            |
| King Kong                                  | ★★★★☆☆  | ★★★★★★            | Not Interested  |
| Gladiator                                  | ★★★★★☆☆ | ★★★★☆☆           | Hmm             |
| Spider-Man                                 | ★★★★★☆☆ | ★★★★☆☆           | Very Bad        |
Similarity to others

Just as people like groups whose focus seems similar to their own interests and goals, they like other people who are similar to them in preferences, attitudes, and values, and they are likely to work or interact with similar others. In his pioneering longitudinal study of college students, Newcomb (1953; 1960) found that high interpersonal attraction developed among those who initially had attitudes in common. In the studies we reviewed, researchers frequently manipulated perceived similarity among group members to vary group members’ attachments to each other. Typically, participants completed a personality and friendship questionnaire and were told that they were assigned to a group whose members probably would become close friends (Hogg & Turner, 1985; Postmes et al., 2001). When similarity was presented as the sharing of unique personal attributes between the self and other members, but not necessarily an in-group prototype (e.g., unique movie tastes or personal preferences of celebrities), it triggered bonds-based attachment with the target being idiosyncratic individual members who could not necessarily be replaced with any other group member (Hogg 1992, p. 100).

**Design claim:** Highlighting interpersonal similarity as part of idiosyncratic personal characteristics will foster closeness among individual members and bond-based commitment.
3.5. Reducing repelling forces that undercut personal commitment

Community size

Many communities strive to grow by actively recruiting new members. Unfortunately, growing a successful community to a large size can have a negative impact on commitment. People feel more committed to smaller groups than larger ones (Carron & Spink, 1995). Moreover, if the community produces a large volume of communications, the site can feel cluttered, impersonal, and overwhelming to people, and result in high turnover. In one analysis of a large sample of Usenet newsgroups, the more messages posted in a group during a month, the smaller was the proportion of posters who returned in the subsequent month (Jones, Ravid & Rafaeli, 2004). Although email-based listserv communities attracted more new members per month if they were larger, those with more traffic had higher turnover rates (Butler, 2001). In synchronous IRC channels (Jones et al., 2008), a few people are needed for discussion, but as more than enough people are available to participate, fewer of them actually do so. As a result, the number of people participating in a discussion asymptotes at about 40, regardless of the number of members of the community.

**Design claim:** Large volumes of communication in an online community will drive away participants or cause less participation per community member.

An online community’s size affects identity-based and bonds-based commitment in different ways. When people feel identity-based attachment to a group, they tend to perceive others in the group as interchangeable (Turner, 1985). One implication of this perception is that identity is comparatively stable in the face of turnover in membership. In contrast, in bond-based attachment, people feel connections to each other and less to the group as a whole. Consider, for example, friends who decide to join a contract bridge club. In this case, the club members have a common bond with their friends who are also members, but they may not have a common identity with the club as a whole. Should their friends leave the club, they are likely to drift away as well (e.g., Krackhardt & Porter, 1986).

Because direct, person-to-person communication is the core of forming interpersonal bonds, the effects of communication overload may be greatest for people with bond-based commitment to an online group or community. Community size negatively affects bonds-based commitment because close interpersonal relationships are costly to maintain. When people relate to others, they devote time and attention to them. Thus people are only able to maintain a limited number of strong ties with others. The anthropologist Robin Dunbar (1993) proposed that humans evolved having a cognitive limit, on average 150, to the number of individuals with whom they could maintain close, stable relationships. (Of course, this number varies across different people. Extraverts know more people than introverts do because they spend more time communicating with others, seeking out relationships, and engaging in social events.) Dunbar’s theory may apply to the upper limit of many online communities before they divide into smaller groups. Even though social networking sites have greatly expanded social circles and reduced the cost of maintaining weak ties (Granovetter 1973), these sites do not necessarily increase the number of
close ties people have. A survey of university students shows the average number of friends listed on their Facebook profiles ranged between 150 and 200 (Ellison et al. 2007). Similarly, the following histogram shows that most guilds in Ultima game had fewer than 150-200 members.

Example 3. Histogram of Ultima Online game guild size distribution (active members only).

Increased community size, communication volume, and member turnover all reduce the opportunity for members to keep in touch with specific valued friends and they make it difficult to repeatedly come across and converse with a small set of others. For example, the movie site IMBD hosts messages from thousands of people ranging from teens to movie producers. Posts arrive at the site in such quantity that a new post is likely to remain on the front page less than 20 minutes. Under these conditions, it will be difficult for pairs of people to come across each other frequently enough for them to form and maintain interpersonal bonds within the community. In a field experiment in a movie discussion community, we found that the use of algorithms to repeatedly expose individuals to movie groups led to a significant increase in member commitment to these groups whereas the same algorithm to repeatedly expose individuals to familiar others did not have such an effect. We believe this lack of effect was due to the comparatively large number of individuals who were exposed to the focal person (Ren et al. 2009).

**Design claim:** A large volume of communication in an online community is more likely to drive away people whose commitment to the community is through interpersonal bonds than through social identity.

Having large numbers of members and high turnover is less a problem for identity-based communities than for bond-based communities because for the identity-based groups, the large membership provides their core resource, rich new content. For people seeking bond-based attachment to group, by contrast, unconstrained growth can be overwhelming, and the turnover it fosters can make the community seem impersonal. Designers of bond-oriented communities therefore need to detect and manage the “snowballing” effects of friends leaving.

Last saved 1/4/2010
**Design claim:** Designers should intervene when a large number of (core) members leave, especially in bond-oriented communities.

Community members whose commitment is to individual friends or to small subgroups need mechanisms to organize and synchronize communication among subsets of the population. One strategy is to create “neighborhoods” within the larger online community, in which a subset of the population can congregate. Online role playing sites, like World of Warcraft, use consistency of the server on which an individual subscriber plays the game as a device to insure that that the subscriber will repeatedly run into others assigned to the same server. In addition, these games typically have special communication features that alert them when other members of their marauding teams, known as guilds, are online and that allow them to broadcast communication exclusively to guildmates wherever they are in the sprawling virtual words they inhabit. The “rooms” in a traditional Multi-user Dungeons and Dragons site (MUDS) serve a similar function to increase repeated interaction among a subset of users. So too do the friends lists and newsfeed in Facebook that allow members to subscribe to updated information about the people in their friends list. Good search facilities that let members find people and subgroups they care about could augment these online neighborhoods.

**Design claim:** Clustering a bond-based community into subgroups organized around pre-existing relationships will help sustain members’ bond-based commitment.

**Diversity**

Most people feel psychologically safer when a community’s membership is more homogeneous than when there is a diversity of member backgrounds and views. Membership diversity can lead people to feel there may be less coherence of community purpose than they would like and a fracturing of community communications. The growth of a community can lead to more diversity of membership than the community had in the past, if only because new cohorts are younger, with different concerns than older members have. Such diversity of membership attributes can threaten people’s sense of common social identity and lead to turnover in groups (Williams & O’Reilly, 1998). New cohorts are likely to differ from oldtimers not just in their personal attributes but also in attitude and motivation. For example, when Systers, a listserv for female mostly university-based computer scientists, started recruiting many younger women, the newcomers were more likely to be employed by industry and to be interested in success in that nonacademic domain. Many older Systers left, and a new effort had to be mounted to keep the community going (cite).

**Design claim:** Diversity of members’ interest in an online community can drive away members, especially those with identity-based commitment.

When diversity among member interests becomes too high, an obvious option is to partition participants into clusters with similar interests or preferences. Many national associations such as the National Parent Teacher Association (PTA) organize local groups so that people from the same region can interact and get to know one another. Another option might be to segment groups based on their preferred topics or activities. Flickr has millions of members who display
and share photographs on a on almost any subject in the world. However, Flickr also supports many subgroups organized around more focused topics – such as geographic areas.

Encyclopedias by definition are designed to encompass a broad range of content. The over 2,000 WikiProjects are one of the mechanisms in Wikipedia to maintain editors’ commitment in the face of huge diversity of content and interests. WikiProjects are groupings of people and articles around common topics, such as military history, comics, psychology, and the Beatles. Empirical research shows that editors become committed to Wikipedia after joining a project, increasing the amount of work they do and shifting some of their work towards the type of citizenship behavior needed to keep any organize going (Kittur et al, 2009).

A cap or an entry barrier also can be considered to filter out people who do not fit or who are less committed to a subgroup. Second Life has separate spaces for children and teens, people with Asperger’s syndrome, and people looking for “adult content.” We have observed much better quality participation in online movie discussion forums that carefully screen and admit new members, such as JoBlo’s Movie Club, as compared with those that have no screening, such as RottenTomatoes.

**Design claim:** Clustering a larger, diverse community into subgroups organized around common interests, geographic area, or demography will help sustain members’ identity-based commitment.

Off-topic discussion

A special problem of diversity among member interests is the management of off-topic conversations, that is, conversations that are irrelevant to the purpose of a community such as political comments or revelations about personal experiences in a movie discussion group. Community designers must decide whether to impose policies to control the discussion on the site, either to keep it on topic, to keep it from spinning out of control, or to keep it in a separate area of the site. (This question also is discussed in the chapter on regulation.) Identity-based communities are likely to want to have people talk primarily about the nominal topic of the community. As the introductory message to Joblo’s Movie Club emphatically states, “Our board is for MOVIE TALK only. If you bring personal issues up on our board, you will be banned. If you discuss your ex-girlfriend, you will be banned. If you announce your comings and goings or gossip about so-and-so, you will be banned. … This is … not a place for you to discuss your personal life or boo-hoo about how your lover just broke up with you” (Joblo Movie Club, 2005).

Online communities announce rules about off-topic messages in introductory messages or as frequently-asked questions archives. They may use moderators to keep conversation on topic, as the welcome page for jewishgen.org indicates, “the role of the moderator is to keep the discussion on track and to let it not get cluttered with irrelevant, inappropriate, or personal messages of no interest to the general readership.” Site administrators, moderators or even ordinary members may give remedial feedback when someone violates this policy by posting inappropriate material.
In contrast to the tight topical focus encouraged in identity-based communities, bond-based communities encourage personal discussion, and their introductory materials often encourage participants to post on a wide range of topics. The Yahoo Personal site, for example, recommended that new posters “Gather your thoughts, tell your story, and see who stops by to say, ‘Hi!’” (Yahoo.com, 2005). In the newsgroup X-Fileaholics, whose nominal topic is discussion of the TV show X-Files, it is normal for members to discuss everything but the show, including favorite music, other television shows or movies, humorous polls, unpleasant events, and recent achievements. Newcomers, in an official welcome message posted within the joining thread, are encouraged to “act demented [because] it runs in the family” (Honeycutt, 2005).

**Design claim:** Off-topic communication will reduce identity-based commitment, but not bond-based commitment to an online community.

A community’s policy to either constrain or open up content has tradeoffs that designers need to address. Restricting conversation to specific domains make the site less appealing to people who want to know individuals better, whereas a policy of encouraging off topic conversation can undercut identity-based attachment (Postmes, Lea, & Spears, 2002).

A more flexible approach could serve both needs. A computer simulation model by Ren and Kraut (under review) suggests that personalized filtering, in which people in a community are exposed only to communications that match their interests, will lead to greater commitment than regimes that do not moderate communicate at all or that moderate it so that the only communication allowed on the site is consistent with the topics around which the site was organized. These effects of personalization seem to be strongest in larger groups or groups encompassing a diversity of topics.

A number of technical approaches can be used to personalize the content of a site. Communities like slashdot.com use member evaluations to serve a moderation function. Members of the community rate posts in a forum for relevance and quality. Readers can then decide to view messages rated above some threshold. Similar functions can be supported through automation. Information retrieval techniques (e.g., Landauer, Foltz & Laham, 1998) can be used to estimate how similar a focal message is to other messages recently posted on a forum, and readers can decide to view messages of different relevance. An administrator of an identity-based site can set a threshold so that newcomers to the community see only the information most similar to the core themes in the community, or could set this information off visually.

Online communities can also segregate bond-building interactions, for example, by using tags. When traffic in the group expanded on the online soap opera newsgroup rec.arts.tv.soap, people started complaining about messages that were unrelated to soap operas. Some members proposed marking messages that were not directly related to soap operas by “TAN” (for tangent) in the subject line so that members who were not interested could easily ignore them, while preserving them in the group for those who were interested (Baym, 1997). Many topic-based communities, such as the movie web-forum RottenTomatoes (rottentomatoes.com/vine) and the computer reviewing site CNET (reviews.cnet.com), provide separate off-topic discussion boards. The “Off Topic Discussion” forum on the Rottentomatoes.com site and the off-topic “Speakeasy” forum
on the CNET site are highly popular. The personal pages on Wikipedia provide an opportunity for contributors to get to know each other, whereas the discussion pages allow topic-based discussions about the editing for encyclopedia articles.

Off-topic forums can be volatile and often require more monitoring and more rules than narrowly constrained forums. For instance, the Lego site has a real person monitor each message. CNET decided to make Speakeasy a “no politics and no religion” zone in 2007, but members objected and the rules were again relaxed. Each post has an icon for reporting objectionable posts.

Example 4. CNET provides a link to report objectionable posts.

Design claim: Personalized filters, which differentially expose members to communications that match their personal interests, will reduce the negative effects that off-topic communication has on identity-based commitment.

Cognitive balance and dissonance

Cognitive balance theory (Heider 1958) postulates a need for balance between different cognitions and emotions. As human beings, we have a desire to balance or align our positive social relations (a sense of togetherness, oneness, and belonging to a social group) with our positive sentiment relations (liking for individual members). In other words, identity-based attachment and bonds-based attachment are inextricably linked due to our desire for cognitive consistence. Newcomb’s (1968) Cognitive Balance theory has a similar argument that liking is more likely to lead to positive unit relations than vice versa; that is, people we like are soon seen to be members of the same groups as ourselves. As a result, inconsistency between identity-based attachment and bonds-based attachment may exist temporarily (e.g., identification with group goals but disliking individual members or liking the members but disagree with group goals), yet will not sustain for a long time before the person leaves the group or changes his or her attitudes to be cognitively consistent or balanced.

Design claim: TBD

Equity theory (Berkowitz and Walster 1976) suggests members care about being 'equitable' or fairness and justice in interdependence between individuals within the group. Conversely, the perception of inequity creates pressure for its reinstatement or for the termination of interdependence, in which case the group has disbanded. [Again, I like the theory, but not sure
what to make out of it or what design claim to make – here are some paragraphs from earlier version on equity

4. Moral Commitment

Identity-based commitment to a community is likely to lead people to feel moral commitment to the community as well. Moral commitment, that is, a feeling that one has obligations to the community and should work on its behalf, especially matters when the community needs strong participation and collective effort to achieve a common goal. In laboratory experiments, group members contribute more money to public goods, work harder to achieve group goals, contribute more, and slack off less when they feel committed to their group as a whole (Karau & Williams, 1993; Karau & Hart, 1998). Utz and Sassenberg (2002) found that labeling others as members of a volleyball team (social identity) versus friends playing volleyball together (bonds) led to significant differences in members’ preferences for how to distribute responsibility within their group. When participants were primed to focus on the volleyball team (identity-based commitment), they agreed to contribute an equal share of money for a broken window even though they were not at fault for breaking the window. When participants were primed to focus on their relationship with fellow members (bond-based commitment), they were not willing to contribute money for the broken window and preferred a solution whereby only the guilty person paid for the broken window.

From this work, we suggest that people with identity-based commitment to an online community may be more likely than those with bond-based commitment to take on community responsibilities or take over tasks from lurkers or slackers and compensate for their lack of contribution. At the same time, they are also likely to have strong opinions against behaviors that jeopardize group survival or success, such as social loafing. By contrast, people with bond-based commitment to the community may be more tolerant of others’ lurking and social loafing, and they may feel less obligated to compensate for a group’s lack of effort.

**Design claim:** Identity-based commitment is more likely to foster moral commitment than bond-based commitment, and identity-oriented communities are more likely to experience moral commitment than bonds-oriented communities.

Task interdependence

A joint task is a task that involves inputs from all members (Culnan, 2005; Lawler, 2001; Worchel et al., 1998; Sherif, et al., 1961; Cartwright, 1968). Communities whose members are cooperatively interdependent because they have a joint task tend to be more cohesive and committed to the group. Interdependence through a joint task not only fosters identification with the community but also moral commitment. Members come to feel that the group depends on them and will actually use and benefit from their work. Many online communities try to foster the perception of task interdependence. Guilds in World of Warcraft have strong interdependence, as they work together in highly synchronized ways to defeat difficult monsters and gain loot for individual members. Citizen science communities (for example, see
pathfinderscience.net/ and buhlplanetarium2.tripod.com/FAQ/citizenscience.html) have created hundreds of interdependent tasks such as winter bird and insect surveys, star watching, stream monitoring, ground level ozone sensing, and lichen tallies that depend on hundreds or thousands of ordinary people to contribute data. Citizen mapping communities such as GIS4Kids and many historic preservation groups enlist their members to help map the world in detail. Apps for cell phones and tools for interactive field completion and mapping allow members to contribute anytime, anywhere, and online visualizations help people see how they contribute and depend on one another.

**Design claim:** Creating tasks that require joint inputs from members and making it clear that the successful fulfillment of community goals requires inputs from all will increase members’ moral commitment to the community.

**Credit**

A community that monitors individuals’ contributions and committed members credit for their contributions will help support their moral commitment to the community. Just as a lack of accountability for misbehavior can undermine the norms of a community (see Regulation chapter), a total lack of credit or recognition for contributions can undermine people’s sense of personal responsibility. By contrast, designers who can increase the personal responsibility that members feel for the experience and outcomes of the community will also encourage more contributions (Cabrera and Cabrera 2002). The provision of credit can be accomplished by making contributions, especially significant contributions and responsibilities, visible. For instance, some professional and technical communities display the names of distinguished contributors in a leader list. When committed members feel the community can see what they are doing to be useful, their feeling that their efforts are known will cause them to feel a greater need to contribute, and will cause other members to learn more and appreciate the costs of others. Encouraging moral commitment helps offset a lack of participation by others (VanLange 1983).

**Design claim:** Making contributions visible and crediting them with helping the community will increase moral commitment.

**Indispensability**

<need to add here the research on the effects of feeling useful and indispensible from social loafing and the Elinor’s work>

Core members in identity-based communities such as Open Source Software (OSS) projects are normally defined or identified by their level of expertise. As a result, their contributions promote an ordered and productive group atmosphere (Mockus, Fielding & Herbsleb, 2002). Members of the core group in identity-based communities are generally accorded advanced status and reputation. In open source software communities such as Apache and Mozilla, for instance, attaining higher status in the hierarchy gives the member more privileges, for instance, a person
who was previously allowed to report bugs is now allowed to contribute patches, and then is
promoted to the role of checking on others’ contributions, and then finally to board member.

Example 5. Apache Software Foundation's leader list gives credit to the work of core members.

Core groups in bond-based communities are normally defined by persistent relationships
among known group members. The Yahoo! Group, workingpei, whose members compete with
their Chinese shar pei dogs in various performance events, has 31 members and a smaller core
group of about 5 people who show up daily on the message boards, reply to one another’s posts,
congratulate one another on their competitions in agility, obedience, and tracking, and trade
training advice. Everyone knows the names of the core group members, their competition
standings, their hobbies and family members, and the names and detailed health and personalities
of their dogs, whose photos and videos are posted on the community site. Members who are in
the same geographic region seek one another out at real-life competitions. A group of core
members can sustain a small community for years but also potentially has detrimental effects on
community growth by dominating conversations, intimidating new users, and diluting peripheral
members’ sense of belonging. Most of these communities welcome lurkers and do not pressure
them to participate. Some authors argue that bond-based communities should be designed to
courage participation of a majority of members (Fisher et al., 2006).

As a community grows and shifts from primarily identity-based or bond-based to mixed
goals, community designers have to consider how to recognize and motivate core members to
continue their above-standard contribution while at the same time encouraging contributions
from more peripheral members. Intimate ties among core group members may need to be
downplayed or even hidden from the rest of the community, to the extent that these are off-
putting to new or peripheral members. Technical interventions such as people recommenders,
similar to commodity or item recommenders, could be deployed to identify peripheral members
who have the resources needed by the group and invite their participation. For example, in open-
source development communities it might be possible to analyze posts and patches contributed
by peripheral members in the past to assign them more substantial work in the future.

**Design claim:** Creating a reputation system or a ladder so that members can accumulate
experiences and gain high status will increase moral commitment.

Reciprocity

People often help others with the expectation that their help will be compensated or reciprocated,
either by those they have helped or by the group as a whole (Blau, 1964; Emerson, 1972). Thus,
reciprocity can occur at the dyadic level or at the community level. A direct exchange occurs
between two people in a dyad when one’s giving is reciprocated by the other. In contrast, a
generalized exchange occurs when one’s giving is reciprocated by a third party rather than the
recipient (Mauss 1925/1967; Constant, Sproull, & Kiesler, 1996; Faraj & Johnson, 2005).

The research indicates that those who feel identity-based commitment to the community will be
more likely to engage in generalized reciprocity, and those with bond-based commitment to an
online community will be more likely to engage in direct reciprocity. People who feel identity-
based commitment to a community purpose, such as open-source software developers or
members of electronic knowledge networks, are more likely to engage in generalized reciprocity
because they are attached to the community as a whole. For example, in open-source
development communities, old-timers often give help to newcomers, even though the newcomers
have not yet contributed to the community (e.g., Lakhani & Hippel, 2003). One study of eBay
shows that eBay buyers and sellers participate in the voluntary reputation system to the degree
that they expect others to reciprocate.

Members who have bond-based commitment to the group, in contrast, are more likely to
exchange help with particular others. We hypothesize that they will be less likely to help unless
they know the other person or feel obligated to return a favor that they have received in the past.

To foster reciprocity, designers should build in reminders to reciprocate either at the community
level (in identity-oriented communities) or at the individual level (in bond-oriented
communities). For example, community goal-oriented visualizations that display percent
attainment of community goals will encourage generalized reciprocity, whereas visualizations
that display responses from specific others (as in Facebook) will encourage individually-based
reciprocity.

**Design claim:** Reminding members to reciprocate by either responding to the person who
provides help or responding to community contributions will increase moral commitment.
Example. The expectation of reciprocal behavior drives voluntary feedback on eBay (Dellarocas, Fan, & Wood, 2005).

5. Economic commitment

Economic commitment refers to a type of attachment to an online community that depends on people’s experience of the net benefits they derive from the community. When net benefits are positive, members perceive that they get sufficient rewards to warrant the time, effort, and frustration they spend on the community. When benefits are missing or low, and the costs of leaving the community are low, economic commitment will be low. Although most research suggests that most people do not become committed to a group only because of the benefits they personally receive from the community, some members do care about these benefits (Wasko and Faraj, 2000). Some online communities try to supplement the intangible benefits members derive with specific benefits for those who participate and contribute. For example, epinions.com offers profit sharing; Slashdot.com offers recognition, and Coolsolutions.com offers T-shirts that symbolize that the wearer has made a meaningful contribution (Tedjamulia et al., 2005). Many sites offer ratings, status, or points to reward contributions. According to some researchers, these direct rewards for contributions can rob people of the intangible pleasure they get from contributing, and their sense of identity with the community, but other researchers believe direct rewards can usefully supplement psychological incentives. We consider the tradeoffs of offering direct rewards below.

Positive feedback
Online communities can offer financial or material rewards, performance ratings, and social rewards and recognition as incentives for significant contributions. Tedjamulia et al. (2005) have argued that if the members of a community perceive such rewards as controlling their behavior, then their personal motivations tend to be crowded out by these rewards. For example, they say, if an online community manager decides to offer money to its members for their contributions, the members will start contributing in order to earn the money. (An example of this kind of reward is seen in the Amazon turker site. Turkers are paid on a piecework system.) If the manager in such a community stops offering money, people will stop contributing because they now value the monetary reward more than their own satisfaction from helping the community or other members. By contrast, rewards clearly used as positive feedback rather than direct payment are felt to be informative, and can actually enhance personal motivations. For example, if the community gives the top ten contributors a T-shirt for their many contributions, these members will feel appreciated; in effect, they will feel more motivated because the community has acknowledged their efforts. Lawler’s review of a large literature on rewards and incentives suggests that rewards have to be carefully structured not to undercut people’s personal and moral commitment. Rewards should be meaningful rather than arbitrary, credible, salient, and applied not too frequently in order to reinforce highly desired contributions (Lawler 2000).

**Design claim.** Rewards that are informative rather than controlling will increase economic commitment without undercutting personal commitment.

Costs of leaving

Economic commitment can be based on the high costs of leaving a community. Other things equal, people are more likely to remain in a group or community as the costs of leaving increase. One kind of cost is the switching costs that occur because members have accumulated assets that lose some or all of their value outside of the community (citation). These assets can include the friends they made in the community, the pictures, loot or other real or intellectual property they have accumulated in the community, and their online reputation they developed to operate in the community, if these assets are difficult to move to a new group. Empirical research demonstrates that one can design online services to increase switching costs and thereby reduce the likelihood that people will abandon the site. In a study of turnover in customers’ user of online brokerage sites, Chen and Hitt (2003) showed that established customers were less likely to leave compared to new customers when sites provided relationship services, which included personalizing data, reusing customer data to facilitate future transactions, using customer data to support business or personal needs such as filing taxes, and allowing a customer to customize the site.

A related switching cost is the loss of skill, expertise, or facility with the site that occurs when people move to a new community. Indeed, Chen and Hitt’s study showed more turnover in sites that were easier to use, presumably because ease of use reduced customers investment in learning how to use the site. Some communities reduce the specific usability of leaving the site (Shapiro and Varian ref). For example some communities such as Facebook make it difficult to
export friends lists or accumulated personal information such as profiles. Netflix and Movielens also use a type of “lock-in” in that they do not allow people to export their ratings database information to other sites.

The creation of assets or skills that have value only within the community and depreciating that value if a person leave the community are design decisions. For example, in most multiplayer games such as World of Warcraft, players accumulate experience points, gear and reputation by playing over extended periods. Thus, in World of Warcraft, players can buy a mount to transport them rapidly across the landscape only after they have completed enough quests to reach level 40 in the game and have accumulated the price of the mount in in-game gold. Their experience points, mount, and gold become worthless if they abandon the game. The developers of these multiplayer games put policies in place to depreciate the value of these accumulate assets if players leave. Selling in-game currency, loot, or other virtual items for real money is against the terms of service for most multi-player games. In 2006, Blizzard, the company operating World of Warcraft suspended over 15,000 accounts for selling virtual property. The operators of multi-player games persuaded the on-line auction house eBay to delist auctions for virtual items, with the rationale being that the gold and loot are owned by the game operators and only rented to players as part of their subscription fee.

**Design claim:** Providing people with assets that have value within a community but that lose their value outside of the community will decrease their likelihood of abandoning the community. Just as research evidence indicates that people join online groups when some of their friends are already there (Backstrom et al, 2006; Crandall et al, 2008) and leave organizations when friends leave (Krackhardt & Porter, 1986), we would expect that the presence of a large fraction of one’s social network in an online group will deter people from leaving an online community. That is, having a large fraction of one social network already existing in an online community can draw outsiders into the community and prevent them from leaving once they have joined. Many online communities exploit this asymmetry by making it easy for an existing member of an online community to import out-of-community members to the community, but they make it difficult to export them. For example, social networking sites like Myspace and Facebook provide tools that automatically generate invitations to the people in one’s email address book, but do not provide similar tools to export community member names and addresses to an external application, including an email address book. To counter this phenomenon, Google developed an OpenSocial application programming interface (API) to allow applications to offer services across multiple social websites. However, it is not in the best interest of the largest social websites to support a programming interface that makes it easier for its members to take advantages of services elsewhere. It is probably for that reason that Facebook, the largest social networking site, does not support the OpenSocial standard.

**Design claim:** Making it difficult for members of an online community to export their in-community contacts will decrease their likelihood of abandoning the community.

Another cost of leaving is that of identifying a comparable community to which members can switch. Just as people continue in a job they dislike if there are few alternative jobs available, so
will people be likely to remain in an online community if there are few others available in their niche that serve many of the same needs (McPherson & Rotolo, 1996; Wang 2007). Because community designers and managers have little control over the environment in which their community operates, it is hard to design for this cost in advance. However, all communities must adapt to new competition by continually monitor the external environment in order to be able to adapt to change. An interesting example of this adaptation is seen in the website of a venerable British design house, Burberry. Noticing the power of social network sites, when Burberry posted street views of models wearing its famous trenchcoats, the company also allowed customers to upload their own photos. “Burberry invites photographers and trench coat owners to participate in Art of the Trench. Trench portraits must be taken outdoors and feature you or a friend wearing a Burberry trench coat. There are no restrictions on photographic style or location.” This feature, at http://artofthetrench.com/, was an instant hit, producing thousands of photos and comments on them, creating community out of a previously staid commercial site, and putting Burberry far ahead of competitor design sites.

**Design claim:** Continually measuring what competitive communities are offering will increase the ability of the designer to adapt to change and keep committed members around.

7. Conclusion

Research suggests that understanding community members’ different kinds of commitment to the community can help us understand and make key design decisions ranging from policies for off-topic discussion to how much personal information about members will be allowed. Our review takes a first step toward mining social science theories to inform community design. We also argue more generally that we can study theory in social psychology, sociology, and economics to help us take a more principled approach to designing online communities. Nonetheless, there are limitations to theory that was developed in laboratories and contexts other than online. We advocate research using approaches such as field experiments in online communities and agent-based modeling techniques to develop both theory and practice. Our specific design ideas drawn from the identity and bond literature offers a way to approach these questions. That is, by testing the impact of these design choices we can contribute to theory and practice.

Understanding what motivates potential community members is one of the most important problems facing a community designer. People have different motivations, and we need to recognize these differences so that the community fits the needs of the people it most wants to attract. For instance, do target members care about being part of a high profile community, one that might get written up in Wired? Or do they want to find people with the same special and perhaps very narrow interest--defenders of Scrabbulus, collectors of porcelain dolls, lovers of Lego blocks, or people with political passions? Or, do your target members already belong to a society or association and want it represented online, just for them? Or, do they really not care about community at all, but just want to meet individuals to date? One approach may not suit all, and you will have to design for different segments of the population (Sassenberg, Shah, Jonas, &
Brazy, 2007). It is not an accident that many successful communities were created by someone who personally experienced or observed the needs of his or her own community.

Consider one choice that those running a health support group must make. Should the design of this site, through its moderation, policies, or structure, discourage members from having off-topic discussions? If members are using the forum to get advice about medications and their side-effects, off-topic posts about such things as the writer’s dog or the latest Steelers football score can be distracting, and they may be especially off-putting to newcomers whose initial expectations are likely to be violated. On the other hand, off-topic discussion provides opportunities for self-disclosure and friendship (Preece & Maloney-Krichmar, 2003). If designers discourage off-topic discussion, they might lose people who would like to talk with others like themselves. Discouraging off-topic discussion also may annoy old-timers, who have gotten to know each other. Thus, the choice that community designers make about off-topic discussion can influence who joins the community and who stays.

Similar trade-offs occur when designers decide whether to limit the size of an online community or allow unlimited growth, whether to cluster users into communities of interest or provide unstructured access to all content, or whether to require members to register with a verifiable identity or allow them to participate in the community anonymously. As we will show in this chapter, the first option in each case favors people who are seeking personal relationships, whereas the second option favors those who are seeking specific information. These issues represent a challenge in online community design – how to configure and manage the community to satisfy members with divergent and possibly changing motives.

At the outset, design decisions will be more straightforward in communities with a predominant purpose, either identity or bond. Identity-based communities should have clear mission statements and policies to keep conversation on-topic, can tolerate anonymity and large numbers of participants, and can conduct all communication in public forums. By contrast, bond-based communities should phrase their mission statements to encourage members to engage in and to tolerate conversations on wide-ranging topics, and would improve if the numbers of participants were limited, if they had mechanisms for private communication and identifying members. Many design features like these are in widespread use in online communities.

Design decisions will more challenging in communities with dual purposes that blend members with divergent and dynamic preferences. Typically, these communities are larger and have a longer history. Because these online communities attract some members with identity-based goals and some with bond-based goals, the design challenge is to reconcile what can be conflicting recommendations.
References
Amichai-Hamburger, Y. (2005). Internet minimal group paradigm. *CyberPsychology & Behavior, 8*(2), 140-142.

Anonymous. (2006). Wikipedia. Retrieved May 23, 2006, from http://en.wikipedia.org/wiki/Wikipedia

Arguello, J., Butler, B. S., Joyce, L., Kraut, R., Ling, K. S., Rosé, C. P., et al. (2006). Talk to me: Foundations for successful individual-group interactions in online communities. In CHI 2006: *Proceedings of the ACM conference on human-factors in computing systems*. New York: ACM Press.

Alexa.com. (2006). Top sites - English. Retrieved May 19, 2006, from http://www.alexa.com/site/ds/top_sites?ts_mode=lang&lang=en

Back, K. W. (1951). Influence through social communication. *Journal of Abnormal and Social Psychology, 46*, 9-23.

Backstrom, L., Huttenlocher, D., Kleinberg, J., & Lan, X. (2006). Group formation in large social networks: membership, growth, and evolution. *Proceedings of the 12th ACM SIGKDD international conference on knowledge discovery and data mining*, 44-54.

Baym, N. K. (1997). Interpreting soap operas and creating community: Inside an electronic fan culture. In S. Kiesler (Ed.), *Culture of the Internet* (pp. 103-120). Mahwah, NJ: Lawrence Erlbaum Associations.

Blau, P. M. (1964). *Exchange and power in social life*. New York: John Wiley.

Bossard, J. (1932). Residential propinquity as a factor in marriage selection. *American Journal of Sociology, 38*(2), 219.

Brewer, M. B. (2001). The many faces of social identity: Implications for political psychology. *Political Psychology, 22*(1), 115-125.

Brewer, M. B., & Gardner, W. (1996). Who is this "we"? Levels of collective identity and self representations. *Journal of Personality and Social Psychology, 71*(1), 83-93.

Bryant, S. L., Forte, A., & Bruckman, A. (2005, November 6–9). Becoming Wikipedian: Transformation of participation in a collaborative online encyclopedia. Paper presented at the Group '05, Sanibel Island, FL.

Butler, B. S. (2001). Membership size, communication activity, and sustainability: The internal dynamics of networked social structures. *Information Systems Research, 12*(4), 346–362.

Butler, B., Sproull, L., Kiesler, S., & Kraut, R. (2007). Community effort in online groups: Who does the work and why? (pp. 171-194). In S. Weisband. (Ed.), *Leadership at a distance*. NY: Lawrence Erlbaum/Taylor Francis.

Byrne, D. (1971). *The attraction paradigm*. New York: Academic Press.

**Cabrera, A. and Cabrera, E. F. (2002). Knowledge sharing dilemmas. Organization Studies, 23, 687–710.**

Carron, A., & Spink, K. (1995). The group size-cohesion relationship in minimal groups. *Small group research, 26*(1), 86.

Last saved 1/4/2010
Cartwright, D. (1968). The nature of group cohesiveness. In D. Cartwright & A. Zander (Eds.), Group dynamics: Research and theory (Vol. 91-109). New York: Harper & Row.

Cartwright, D., & Zander, A. (1953). Group cohesiveness: Introduction. In D. Cartwright & A. Zander (Eds.), Group dynamics: Research and theory. Evanston, IL: Row Peterson.

Chen, P., & Hitt, L. (2003). Measuring switching costs and the determinants of customer retention in Internet-enabled businesses: A study of the online brokerage industry. Information Systems Research, 13(3), 255-274.

Constant, D., Sproull, L., & Kiesler, S. (1996). The kindness of strangers: On the usefulness of weak ties for technical advice. Organization Science, 7, 119-135.

Crandall, D., Cosley, D., Huttenlocher, D., Kleinberg, J., & Suri, S. (2008). Feedback Effects between Similarity and Social Influence in Online Communities KDD'08: Proceedings of the ACM conference on knowledge discovery and data mining. New York: ACM Press.

Culnan, M. J. (2005, March 11-12, 2005). Online communities: Infrastructure, rational cohesion and sustainability. Paper presented at the Workshop on Social Informatics: Extending the Contributions of Professor Rob Kling to the Analysis of Computerization Movements, Irvine, CA.

Davison, K. P., Pennebaker, J. W., & Dickerson, S. S. (2000). Who talks? The social psychology of illness support groups. American Psychologist, 55(2), 205-217.

Dawes, R. M., & Thaler, R. H. (1988). Anomalies cooperation. Journal of Economic Perspectives, 2(3), 187-197.

Dellarocas, Chrysanthos N., Fan, Mg and Wood, Charles A., Self-interest, and Participation Online Reputation Systems (February 2004). MIT Sloan Working Papers No. 4500-04.

Dunbar, R. I. M. (1993). Coevolution of neocortical size, group size and language in humans. Behavioral and Brain Sciences 16 (4): 681-735.

Dholakia, U. M., Bagozzi, R. P., & Pearo, L. K. (2004). A social influence model of consumer participation in network- and small-group-based virtual communities. International Journal of Research in Marketing, 21(3), 241-263.

Emerson, R. M. (1972). Exchange theory: A psychological basis for social exchange. In J. Berger, M. Zelditch & B. Anderson (Eds.), Sociological theories in progress (Vol. 2, pp. 38-87). Boston: Houghton Mifflin.

Faraj, S., & Johnson, S. L. (2005). Reciprocity or generalized exchange? Structuring of electronic knowledge networks. Paper presented at the Academy of Management Annual Meeting, Honolulu, Hawaii.

Fisher, D., Smith, M., & Welser, H. T. (2006). You are who you talk to: Detecting roles in Usenet newsgroups. Paper presented at the 39th Hawaii International Conference on System Sciences - 2006, Waikoloa, Big Island, Hawaii.

Friedman, E., & Resnick, P. (2001). The social cost of cheap pseudonyms. Journal of Economics and Management Strategy, 10(2), 173-199.

Gaertner, S. L., Dovidio, J. F., Banker, B. S., Houlette, M., Johnson, K. M., & McGlynn, E. A. (2000). Reducing intergroup conflict: From superordinate goals to decategorization, recategorization, and mutual differentiation. Group Dynamics: Theory, Research, and Practice, 4(1), 98-114.
Ginsburg, M., & Weisband, S. (2002). Social capital and volunteerism in virtual communities: The case of the internet chess club. Paper presented at the 35th Annual Hawaii International Conference on System Sciences.

Goodman, P. S., & Leyden, D. P. (1991). Familiarity and group productivity. *Journal of Applied Psychology, 76*(4), 578-586.

Gross, N., & Martin, W. (1952). On group cohesiveness. *American Journal of Sociology, 546*-564.

Higgins, E. T. (2005). Value from regulatory fit. Current Directions in Psychological Science, 14(4), 209-213.

Hinds, P. J., Carley, K. M., Krackhardt, D., & Wholey, D. (2000). Choosing work group members: Balancing similarity, competence, and familiarity. *Organizational Behavior and Human Decision Processes, 8*(2), 226-251.

Hogg, M. A. (1992). *The social psychology of group cohesiveness: From attraction to social identity*. London: Harvester Wheatsheaf.

Hogg, M. A. (1993). *Group cohesiveness: A critical review and some new directions*. In W. Stroebe & M. Hewstone (Eds.), *European review of social psychology* (Vol. 4, pp. 85-111). London: Wiley.

Hogg, M. A., & Terry, D. J. (2000). Social identity and self-categorization processes in organizational context. *Academy of Management Review, 25*(1), 121-140.

Hogg, M. A., & Turner, J. C. (1985). Interpersonal attraction, social identification and psychological group formation. *European Journal of Social Psychology, 15*, 51-66.

Homans, G. C. (1951). *The human group*. London: Routledge and K. Paul.

Honeycutt, C. (2005). Hazing as a process of boundary maintenance in an online community. *Journal of Computer-Mediated Communication, 10*(2), np.

Hutchison, P., Jetten, J., Christian, J., & Haycraft, E. (2006). Protecting threatened identity: Sticking with the group by emphasizing ingroup heterogeneity. *Personality and Social Psychology Bulletin, 32*(12), 1620.

Joblo Movie Club. (2005). Basic rules and guidelines. Retrieved Dec 6, 2005, from http://www.joblo.com/forums/announcement.php?s=641f9ed5b47beab4ad423f0c861dba3c&forumid=21

Jones, Q., Moldovan, M., Raban, D., & Butler, B. (2008). Empirical evidence of information overload constraining chat channel community interactions *CSCW08: Proceedings of the ACM Conference on Computer-Supported Cooperative Work* (pp. 323-332). New York, NY, USA: ACM Press.

Jones, Q., Ravid, G., & Rafaeli, S. (2004). Information overload and the message dynamics of online interaction spaces. *Information Systems Research, 15*(2), 194–210.

Karasawa, M. (1991). Toward an assessment of social identity: The structure of group identification and its effects on in-group evaluations. *British Journal of Social Psychology, 30*, 293-307.

Karau, S. J., & Hart, J. W. (1998). Group cohesiveness and social loafing: Effects of a social interaction manipulation on individual motivation within groups. *Group Dynamics: Theory, Research, and Practice, 2*(3), 185-191.
Karau, S. J., & Williams, K. (1993). Social loafing: A meta-analytic review and theoretical integration. *Journal of Personality and Social Psychology, 65*(4), 681-706.

Kim, A. J. (2000). Community building on the web. Berkeley, CA: Peachpit Press.

Kittur, A., Pendleton, B., & Kraut, R. E. (In press). Herding the Cats: The Influence of Groups in Coordinating Peer Production *WikiSym 2009: Proceedings of the 5th International Symposium on Wikis and Open Collaboration.*

Kluger, A. N., and DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*, 254–284.

Kollock, P., & Smith, M. (1996). Managing the virtual commons: Cooperation and conflict in computer communities. In *Computer-mediated communication: Linguistic, social, and cross-cultural perspectives* (pp. 109-128). Amsterdam: John Benjamin.

Krackhardt, D., & Porter, L. W. (1986). The snowball effect: Turnover embedded in communication networks. *Journal of Applied Psychology, 71*, 50-55.

Kraut, R., Mukhopadhyay, T., Szczyupa, J., Kiesler, S., & Scherlis, B. (2000). Information and communication: Alternative uses of the Internet in households. *Information Systems Research, 10*, 287-303.

Lakhani, K. R., & Hippel, E. V. (2003). How open source software works: "free" user to user assistance. *Research Policy, 32*, 923-943.

Landauer, T. K., Foltz, P. W., & Laham, D. (1998). An introduction to latent semantic analysis. *Discourse Processes, 25*(2-3), 259-284.

Lawler, E.E. I. (2000). *Rewarding excellence.* San Francisco, CA: Jossey-Bass.

Ledyard, J. O. (1995). Public goods: A survey of experimental research. In J. H. Kagel & A. E. Roth (Eds.), *The handbook of experimental economics* (Vol. 2, pp. 111-194). Princeton, NJ: Princeton University Press.

Lewin, K. (1951) *Field theory in social science: Selected theoretical papers.* D. Cartwright (ed.). New York: Harper & Row.

Levine, J. M., & Moreland, R. L. (1998). Small groups. In D. T. Gilbert, S. T. Fiske & G. Lindzey (Eds.). *The handbook of social psychology* (pp. 415-469). Boston: McGraw-Hill.

Ling, K., Beenen, G., Ludford, P. J., Wang, X., Chang, K., Li, X., et al. (2005). Using social psychology to motivate contributions to online communities. *Journal of Computer Mediated Communication, 10*(4), np.

Lott, B. (1961). Group cohesiveness: A learning phenomenon. *Journal of Social Psychology, 55*, 275-286.
Ludford, P. J., Cosley, D., Frankowski, D., & Terveen, L. (2004). Think different: Increasing online community participation using uniqueness and group dissimilarity. In Proceedings Of Human Factors In Computing Systems, CHI 2004 (pp. 631-638.). NY: ACM Press.

Mauss, M. (1967). The gift. New York: Norton. (Original work published in 1925).

McKenna, K. Y. A., Green, A. S., & Gleason, M. E. J. (2002). Relationship formation on the Internet: What's the big attraction? Journal of Social Issues, 58(1), 9-.

McPherson, J., & Rotolo, T. (1996). Testing a dynamic model of social composition: Diversity and change in voluntary groups. American Sociological Review, 179-202.

Meyer, J., Stanley, D., Herscovitch, L., & Topolnytsky, L. (2002). Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences. Journal of Vocational Behavior, 61(1), 20-52.

Michinov, N., Michinov, E., & Tocek-Capelle, M. C. (2004). Social identity, group processes, and performance in synchronous computer-mediated communication. Group Dynamics: Theory Research and Practice, 8(1), 27-39.

Milgram, S. (1977). The familiar stranger: An aspect of urban anonymity. In S. Milgram (Ed.), The individual in a social world: Essays and experiments. Reading, Mass. Addison-Wesley Pub. Co., 1977.

Mockus, A., Fielding, R. T., & Herbsleb, J. D. (2002). Two case studies of open source software development: Apache and Mozilla. ACM Transactions on Software Engineering and Methodology, 11(3), 309-346.

Moreland, R. L., & Levine, J. M. (1989). Newcomers and oldtimers in small groups. In P. B. Paulus (Ed.), Psychology of Group Influence (pp. 143-186). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Newcomb, T. (1961). The acquaintance process. New York: Holt, Rinehart, & Winston.

Newcomb, T. M. (1953). An approach to the study of communicative acts. Psychological Review, 60, 393-404.

Newcomb, T. M. (1960). Varieties of interpersonal attraction. In D. Cartwright & A. Zander (Eds.), Group dynamics: Research and theory (pp. 104-119). Evanston, IL: Row, Peterson.

Ostrom, E. (1990). Governing the commons: The evolution of institutions for collective action. Cambridge: Cambridge University Press.

Ouwerkerk, J. W., de Gilder, D., & de Vries, N. K. (2000). When the going gets tough, the tough get going: Social identification and individual effort in intergroup competition. Personality and Social Psychology Bulletin, 26(12), 1550-1559.

Postmes, T., & Spears, R. (2000). Refining the cognitive redefinition of the group: Deindividuation effects in common bond vs. Common identity groups. In T. Postmes, R. Spears, M. Lea & S. Reicher (Eds.), Side effects centre stage: Recent developments in studies of de-individuation in groups (pp. 63-78). Amsterdam, the Netherlands: KNAW.

Postmes, T., Spears, R., & Lea, M. (2002). Intergroup differentiation in computer-mediated communication: Effects of depersonalization. Group Dynamics: Theory Research and Practice, 6(1), 3-16.

Last saved 1/4/2010
Postmes, T., Spears, R., Sakhel, K., & Groot, D. d. (2001). Social influence in computer-mediated communication: The effects of anonymity on group behavior. *Personality and Social Psychology Bulletin, 27*(10), 1243-1254.

Postmes, T., Spears, R., Lee, A. T., & Novak, R. J. (2005). Individuality and social influence in groups: Inductive and deductive routes to group identity. *Journal of Personality and Social Psychology, 89*(5), 747-763.

Powazek, D. M. (2002). *Design for community: The art of connecting real people in virtual places*. Indianapolis, IN: New Riders Publishing.

Preece, J. (2000). *Online communities: Designing usability, supporting sociability*. Chichester, England: Wiley.

Preece, J., & Maloney-Krichmar, D. (2003). Online communities: Focusing on sociability and usability. In J. Jacko & A. Sears (Eds.), *Handbook of human-computer interaction* (pp. 596-620). Mahwah, NJ: Erlbaum Associates Inc. Publishers.

Prentice, D. A., Miller, D. T., & Lightdale, J. R. (1994). Asymmetries in attachments to groups and to their members: Distinguishing between common-identity and common-bond groups. *Personality & Social Psychology Bulletin, 20*(5), 484-493.

Putnam, R. (2000). *Bowling alone: The collapse and revival of American community*. New York: Simon & Schuster.

Rafaeli, S., Ravid, G., & Soroka, V. (2004). De-lurking in virtual communities: A social communication network approach to measuring the effects of social and cultural capital. Paper presented at the 37th Hawaii International Conference on System Sciences, Waikoloa, Big Island, Hawaii.

Resnick, P., & Varian, H. (1997). Recommender systems. Introduction to special section. *Communications of the ACM, 40*(3), 56-58.

Ridings, C. M., & Gefen, D. (2004). Virtual community attraction: Why people hang out online. *Journal of Computer Mediated Communication, 10*(1).

Ridings, C., Gefen, D., and Arinze, B. (2002). Some antecedents and effects of trust in virtual communities. *Journal of Strategic Information Systems, 11*, 271–295.

Rogers, P., & Lea, M. (2005). Social presence in distributed group environments: The role of social identity. *Behaviour & Information Technology, 24*(2), 151-158.

Sassenberg, K. (2002). Common bond and common identity groups on the Internet: Attachment and normative behavior in on-topic and off-topic chats. *Group Dynamics, 6*(1), 27-37.

Sassenberg, K., & Boos, M. (2003). Attitude change in computer-mediated communication: Effects of anonymity and category norms. *Group Processes & Intergroup Relations, 6*(4), 405-422.

Sassenberg, K., & Postmes, T. (2002). Cognitive and strategic processes in small groups: Effects of anonymity of the self and anonymity of the group on social influence. *British Journal of Social Psychology, 41*, 463-480.

Scaffidi, C. (2006). Trial by water: Challenges in the rapid creation of “Person Locator” websites after hurricane Katrina. Unpublished ms. Carnegie Mellon University.

Last saved 1/4/2010
Seeley, E. A., Gardner, W. L., Pennington, G., & Gabriel, S. (2003). Circle of friends or members of a group? Sex differences in relational and collective attachment to groups. *Group Processes & Intergroup Relations, 6*(3), 251-263.

Shaw, B. R., McTavish, F., Hawkins, R., Gustafson, D. H., & Pingree, S. (2000). Experience of women with breast cancer: Exchanging social support over the chess computer network. *Journal of Health Communication, 5*, 135-159.

Sherif, M., Harvey, L. J., White, B. J., Hood, W. R., & Sherif, C. W. (1961). *Intergroup conflict and cooperation: The robbers cave experiment*. Middletown, CT: Wesleyan University Press (Reprinted in 1988).

Simon, H. (1971) *Computers, Communications and the Public Interest, pages 40-41*, Martin Greenberger, ed., The Johns Hopkins Press.

Slater, M., Sadagic, A., & Schroeder, R. (2000). Small-group behavior in a virtual and real environment: A comparative study. *Presence, Teleoperators and Virtual Environments, 9*(1), 37-51.

Sproull, L. (2003). Online communities. In *The Internet Encyclopedia*, pages 733-744. John Wiley, New York.

Sykes, R., Larntz, K., & Fox, J. (1976). Proximity and similarity effects on frequency of interaction in a class of naval recruits. *Sociometry, 39*, 263-269.

Tajfel, H., Billig, M. G., Bundy, R. P., & Flament, C. (1971). Social categorization and intergroup behaviour. *European Journal of Social Psychology, 1*(2), 149-178.

Tanis, M., & Postmes, T. (2005). Short communication: A social identity approach to trust: Interpersonal perception, group membership and trusting behaviour. *European Journal of Social Psychology, 35*(3), 413-424.

**Tedjamulia, S. J. J., Olsen, D. R., Dean, D. L, & Albrecht, C. C. (2005). Motivating content contributions to online communities: Toward a more comprehensive theory. Proceedings of the 38th Hawaii International Conference on System Sciences ’05.**

Turner, J. C. (1985). Social categorization and the self-concept: A social cognitive theory of group behavior. In E. J. Lawler (Ed.), *Advances in group processes: Theory and research* (Vol. 2, pp. 77-122). Greenwich, CT: JAI Press.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford, UK: Blackwell.

Utz, S. (2003). Social identification and interpersonal attraction in MUDs. *Swiss Journal of Psychology, 62*(2), 91-101.

Utz, S., & Sassenberg, K. (2002). Distributive justice in common-bond and common-identity groups. *Group Processes & Intergroup Relations, 5*(2), 151-162.

**VanLange, P. A., Liebrand, W. B. G., Messick, D. M., and Wilke, H. A. M. (1983). The minimal contributing set as a solution to public goods problems. Political Science Review, 77, 112–122.**

Last saved 1/4/2010
Wagner, W. G., Pfeffer, J., & O'Reilly, C. A., III. (1984). Organizational demography and turnover in top-management groups. *Administrative Science Quarterly, 29*(1), 74.

Walther, J. B., Slovacek, C. L., & Tidwell, L. C. (2001). Is a picture worth a thousand words?: Photographic images in long-term and short-term computer-mediated communication. *Communication Research, 28*(1), 105-134.

Walther, J. B. (2002). Time effects in computer-mediated groups: Past, present, and future. In P. Hinds & S. Kiesler (Eds.), *Distributed work* (pp. 235-257). Cambridge, MA, US: MIT Press.

Wang, X. (2007). *An Ecological Perspective on Online Communities*. Unpublished PhD Thesis. Katz School of Business. University of Pittsburgh, Pittsburgh, PA.

**Wasko, M. M. and Faraj, S. (2000). 'It is what one does': Why people participate and help others in electronic communities of practice. Journal of Strategic Information Systems, 9, 155 –173.**

Wikipedia.org. (2005). Main page. Retrieved Dec 5, 2005, from http://en.wikipedia.org

Williams, K. O’ Reilly, C. (1998). Demography and diversity in organizations: A review of 40 years of research. In *Research in organizational behavior* (Vol. 20, pp. 77-140).

Worchel, S., Rothgerber, H., Day, E. A., Hart, D., & Butemeyer, J. (1998). Social identity and individual productivity within groups. *British Journal of Social Psychology, 37*, 389-413.

Yahoo.com. (2005). Yahoo! Personals: How it works. Retrieved Dec. 5, 2005, from http://personals.yahoo.com/us/homepage/mental_model

Yee, N., Bailenson, J., & Rickertsen, K. (2007). *A meta-analysis of the impact of the inclusion and realism of human-like faces on user experiences in interfaces.*

Yuki, M. (2003). Intergroup comparison versus intragroup relationships: A cross-cultural examination of social identity theory in North American and East Asian cultural contexts. *Social Psychology Quarterly, 66*(2), 166-183.

Yuki, M., Maddux, W. W., Brewer, M. B., & Takemura, K. (2005). Cross-cultural differences in relationship- and group-based trust. *Personality and Social Psychology Bulletin, 31*(1), 48-62.

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality & Social Psychology, 9*(22), 1-27.

Zajonc, R. B. (2001). Mere exposure: A gateway to the subliminal. *Current Directions in Psychological Science, 10*(6), 224-226.