
SENSE OF COMMUNITY IN VIRTUAL ENVIRONMENTS

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Abstract: *This chapter aims to explore the conceptualization of sense of community (SoC) in virtual communities and to discuss the implications of SoC to virtual community researchers and designers. We argue that the changing social structure of virtual communities and the different expectations stemming from computer-mediated communications necessitate a different reflection of the SoC elements in the virtual world. Building on McMillan and Chavis's work, we identify five elements of SoC (common domain of interest, continuous interaction, emotional support, shared history and culture, and virtually constructed identity) and propose a new framework for understanding the evolving nature of SoC in today's virtual environments.*

Keywords: *Sense of Community, Meaningful Interaction, Identity*

Sense of community (SoC), a feeling of attachment to a location-based human community, has been systematically studied by social psychologists in the past. With the proliferation of online interactions in recent years, it is logical and interesting to examine the concept of SoC and its implications in the context of the virtual world. This chapter aims to explore the conceptualization of SoC in virtual communities and to discuss the implications of SoC to virtual community researchers and designers.

DEFINING SENSE OF COMMUNITY

The idea that members in a community share more than location and interests, was first introduced by the psychologist Samuel Sarason in his seminal book *The Psychological Sense of Community: Prospects for a Community Psychology*, published in 1974. Sarason (1974) introduced "sense of community" (SoC) as a conceptual cornerstone for the psychology of communities, claiming that an SoC is "one of the major bases for self-definition" (p. 157). However, Sarason did not extend his idea of SoC to include specific assertions and eluded a definition of the concept. In the years that followed, many researchers attempted to define and reflect on the foundational aspects of SoC (Ahlbrant and Cunningham, 1979; Bachrach and Zatura, 1985; Doolittle and McDonald, 1978; Glynn, 1981; Riger and Lavrakas, 1981), but it was in 1986 that McMillan and Chavis published what is now considered to be the most significant and popular definition of an SoC:

Sense of community is a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together. (McMillan and Chavis, 1986, p. 294)

This definition was later reiterated and refined by McMillan as “a spirit of belonging together, a feeling that there is an authority structure that can be trusted, an awareness that trade, and mutual benefit come from being together, and a spirit that comes from shared experiences” (McMillan, 1996, p. 315). The differences between the two definitions are discussed later in this chapter. Building on Riger and Lavrakas’s (1981) work on neighborhood attachment, and Glynn’s work (1981) on communal interactions and feelings within an Israeli kibbutz, McMillan and Chavis sought to investigate the basis to the SoC—both as is imagined and idealized by members of the community and as the actual SoC members felt—as well as to understand SoC as a facilitator of the individual’s function within the community.

McMillan and Chavis’s Sense of Community Elements

McMillan and Chavis’s original definition is based on four foundational elements: membership, influence, fulfillment of needs, and shared emotional connection among the community members.

Membership

Membership is “the feeling of belonging or of sharing a sense of personal relatedness” (McMillan and Chavis, 1986, p. 9). Several salient subelements of membership were suggested by McMillan and Chavis.

Boundaries. Membership is the direct result of group enforcement of boundaries: there are those who belong to the group and those who do not (McMillan, 1976). Through the boundaries, a community creates a safe haven that fosters feelings of intimacy and emotional dependence. The boundaries also protect the community space from deviants and threats. Boundaries do not serve only the community; they also allow members to define themselves by adhering to group norms or by continuously ignoring them.

Emotional Safety. Emotional safety results from membership in the community. Emotional safety protects group intimacy and allows members to claim their personal “truth” about their experiences (McMillan, 1996). In some cases, such as gangs, the protection that the community bestows upon its members may extend beyond mere emotional protection to influence their physical well-being.

Personal Investment. Personal investment in the community marks the strength of ties between members and the community. When a current or potential member of the community works toward belonging to it by investing time and effort, he or she will be rewarded with a stronger sense of value and placement in the community.

In 1996, McMillan updated and expanded his premise of membership, placing a greater emphasis on the emotional aspect of community that derives from its “spirit” and the “spark of friendship” (McMillan, 1996, p. 315), instead of what was previously termed as “membership.” In both iterations of SoC elements, the different facets of membership in the community are considered to be circular and self-enforcing, where all are causes and effects.

Influence

Influence is a bidirectional concept that encompasses both the member’s influence over the group and the reciprocal affect the group has on its individual members. On the personal level, influence is

a sense of mattering and making a difference, of being able to acknowledge other members' values and opinions and react to them. Without the influence element, members in a community will feel less motivated to participate in the community, as most often people are drawn to communities that offer them the opportunity to feel influential. On the community level, influence translates to what McMillan and Chavis termed "consensual validation"—a knowledge that what members feel and experience is also experienced similarly by other members of the community in a manner that balances group cohesiveness. Consensual validation essentially leads to bidirectional conformity: just as members are trying to adhere to the community norms, the norms are shaped to validate the members' experiences. Conformity is experienced as a force that creates closeness among members as well as an indicator of community cohesiveness (McMillan and Chavis, 1986).

The two facets of the influence element affect each other. When a member resists the community influence, he or she will become less influential. On the other hand, a member who adhered to the influence of other members and that of the community will become more influential in time. While in 1986 McMillan and Chavis found that a tightly knit community will be characterized by influential forces operating both on the community level and on the individual level, McMillan's 1996 update to their theory placed an emphasis on mutual trust rather than influence, reflecting a shift in the way members' needs of the community were viewed in social science literature.

Integration and Fulfillment of Needs

Fulfillment of needs means that behaviors and needs that are deemed by the community as constructive are reinforced and rewarded, while untoward behaviors are penalized.

The community has several ways to reward beneficial behaviors, which coalesce with members' needs and desires. It is the community's obligation to integrate members' needs and resources into its modality. One of the ways is for the community to reward members who behave according to the community norms with status that reflects their success in contributing to the community. Another way is to enhance the collective benefits that the community derives from the competence of members, as research has shown that people are drawn to others whose competence can benefit them in some way (Rapaport, 1977). This echoed what Sarason termed as "an acknowledged interdependence with others, a willingness to maintain this interdependence by giving to or doing for others what one expects from them" (1974, p. 157). McMillan extended the idea of integration to also include members' need for similarity with others and their search for social settings where they will be free of shame or condescension (1996, p. 320). The latter builds into a "community economy" in which self-disclosure is traded, and grows into an environment that facilitates mutual giving and fulfilling each other's needs.

Shared Emotional Connection

McMillan and Chavis found the shared emotional connection to be "the definitive element for true community [as] strong communities are those that offer members positive ways to interact, important events to share and ways to resolve them positively, opportunities to honor members, opportunities to invest in the community, and opportunities to experience a spiritual bond among members" (1986, p. 9). According to them, shared emotional connection stems, in part, from shared history. While members are not required to actually participate in the events that led to the shared history, they are required to reify it and embrace it.

When reviewing the idea of shared emotional connection in 1996, McMillan emphasized not only the historic occurrences, but the "art" of creating a community stories and tradition. Shared

Table 3.1

SoC Elements: McMillan and Charvis (1986) and McMillan (1996)

SoC element	McMillan and Charvis (1986)	McMillan (1996)
Membership	A feeling of belonging based on boundaries, emotional safety, and personal investment	The spirit and the “spark” of friendship
Influence	Bidirectional influence between the member and the group	Trust as a facilitator of information flow and allocation of power within the community
Fulfillment of needs	Reinforcement of positive behaviors through addressing members’ inherent needs	Trading of self-disclosure that facilitates mutual giving and the fulfillment of each other’s needs
Emotional connection	Stems from shared history and opportunities to create member identification with the community	Stems from dramatic and defining moments that become embedded in the community history as representing its values and traditions

experiences bring community members together; however, rather than *frequency* of events that bring them together, it is the *quality* of these events that contributes to building an SoC. It is left to the members of the community to decide among themselves which events will be exalted as defining moments in the history of the community, but all such events have to be those that honor the community’s transcendent values. They will become immortalized as the “community art.” This change in McMillan’s view of SoC is especially important when relating to virtual communities, where the elements of community extend beyond collocation and immediate interaction, to encompass “the spirit” of the community, regardless of geographical components.

Table 3.1 summarizes the key developments of the SoC conceptualization from McMillan and Chavis (1986) to McMillan (1996).

Sense of Community in Virtual Environments

McMillan and Chavis developed their elements of SoC when virtual communities were all but fantasy. Their theory applied to geographically colocated neighborhoods and relational groups that share common interests. Mediated communications that transcend geographic proximity and social status barriers challenged the traditional theory of SoC.

At the dawn of the online community era, many scholars expressed concerns about the effect that new communication technologies have on physical communities. They feared that deterioration of communal cohesiveness and social disconnectedness would strip the community of its many societal benefits (Kiesler et al., 1984; Sproull and Kiesler, 1986). This sentiment culminated in Putnam’s seminal work lamenting the degeneration of social capital within communities in the United States (Putnam, 2000). Other scholars, however, saw an unprecedented chance for recreating communities on a different level through the use of Internet-based communication tools, resulting in virtual settlements (Jones, 1997) and virtual communities (Preece, 2000; Wellman and Gulia, 1999).

In physical communities, concepts such as face-to-face communication, richness of interaction, and preformed ties (based on collocation, shared activities, etc.) contribute to the creation of SoC. Virtual communities, on the other hand, are not based on these attributes and do not support what McMillan

Table 3.2

SoC Elements: McMillan and Charvis (1986) and Blanchard and Markus(1996)

SoC element	McMillan and Charvis (1986)	Blanchard and Markus (2002)
Membership or attachment	A feeling of belonging based on boundaries, emotional safety, and personal investment	Recognition of other members and identification through fabricated or real identity
Influence or agency	Bidirectional influence between the member and the group	Obligation to give back to the community, in reciprocity of what the community has given to its members
Fulfillment of needs	Reinforcement of positive behaviors through addressing members' inherent needs	Informational and socioemotional support, publicly offered to all members of the community
Emotional connection	Stems from shared history and opportunities to create member identification with the community	Stems from personal friendships among members as well as community-wide positive feelings

and Chavis (1986, p. 6) termed as “community residency” in its formal sense. Rather, virtual communities offer their members a virtual haven in which safer self-disclosure routes (or “fulfillment of needs”) exist in a way to cultivate a similar feeling of communal affinity, or a sense of community.

All four SoC elements were individually studied by virtual community researchers: membership (Baym 1999; Greer, 2000; Kollock and Smith, 1999; Mynatt et al., 1997); influence (Baym, 1999; Pikas, 2008; Postmes et al., 2000; Preece, 2000; Rotman and Preece, 2010); fulfillment of needs (Forster, 2004; Greer, 2000; Rotman et al., 2009); and shared history (Baym, 1999; Kollock and Smith, 1999). These studies were generally associated with virtual community sustainability, suggesting that a stronger SoC leads to a more sustainable virtual community. A systematic examination of the applicability of the SoC elements to virtual communities was done by Blanchard and Markus (2002). In the setting of a commercial newsgroup, the researchers studied the way that SoC was experienced by group members and how SoC was manifested in community life. They found that slightly different elements of SoC exist in virtual environments (Table 3.2):

While not analogous to McMillan and Chavis’s SoC, Blanchard and Markus reiterate corresponding elements that exist when SoC is created in virtual settings (they termed it “sense of virtual community” or SoVC). The main difference between the two conceptual frameworks, aside from Blanchard and Markus’s focus on virtual interactions, was in their different perspective of group vs. individual effect on SoC. McMillan and Chavis accentuated group affiliation and attachment as the fundamental elements of SoC. Blanchard and Markus singled out member-to-member nuances and relationships between individuals within the group, as the foundations on which SoVC is built.

Also building on McMillan and Chavis’s theory, Rotman et al. (2009) studied the virtual SoC of YouTube vloggers by correlating structural analysis with the SoC elements. They found that although YouTube users feel and express a strong SoC, their actions tell a different story and do not amount to the level of cohesiveness and intricate interactions that characterize a “community” in its traditional sense. In addition, the researchers found that the visual recognition of each other’s faces in their online communications was a crucial element of SoC for YouTube users, despite the fact that most YouTube users do not meet outside the virtual world. The visual identification allowed the YouTube vlogging members to bolster their ties with others in the community and to enhance their overall SoC.

These recent studies suggest that the SoC elements in virtual communities diverged from the original elements of SoC set by McMillan and Chavis. An explanation to this change may reside in the structures (or lack thereof) of virtual communities. While physical communities are created based on geographical proximity, virtual communities are aggregates of people (often geographically dispersed) with shared interests or needs. This key difference has a striking impact on the community structures. In a geographically based community, we would expect to see multilayered social ties among members. For example, people who go to the same church may also have similar hobbies that bring them together in different settings, and people who join a social club may have kids in the same school and meet in various circumstances. By contrast, a loosely defined common interest is often sufficient for drawing people together to create hubs of interaction in virtual communities. This is especially the case for egocentric communities on social networking Web sites, where the individual user is the focus of network experience and subsequent interactions are created around each member. Moreover, since traditional etiquette guidelines do not necessarily direct people's actions in a virtual community, the expectations from online interactions may be different as well. For example, when a person posts content to a virtual community, not all other members who view this content are obliged to respond, while in the physical world it would be considered extremely impolite to ignore such a gesture. On the other hand, flaming wars, which may be an alienating force in physical communities, can be a strengthening and boundary-creating tool online (Burnett and Buerkle, 2004).

The altered structure of virtual communities will lead to a different perception and formation of SoC. The communities that are based on egocentric ties offer different kinds of engagement, content, and culture to their members. The different expectations stemming from computer-mediated communications contribute to the changing view of online interactions. All of these necessitate a different reflection of the SoC elements in the virtual world.

SENSE OF COMMUNITY IN VIRTUAL COMMUNITIES

Today's virtual communities may be composed of a network of friends (e.g., Facebook), content (e.g., blogs, videos, photos), professional connections (e.g., LinkedIn), or commercial ties (e.g., recommender communities); they may encompass a relatively small number of members or large-scale communities involving hundreds of thousands of members; they can be stationary, mobile, or a combination of the two. Hence, when applying the concept of SoC to virtual communities, we have to capture the variations within virtual communities as well as their innate distinction from physical ones. As Bruckman (2006) noted, the term "community" refers to a category of associations and not a singular type, and nuanced views of the community category are needed to understand its mechanisms and boundaries. With this "fuzzy category" in mind, in this section we attempt to describe a series of components that contribute to the general feeling of attachment in various virtual communities. However, researchers must use caution in assessing or measuring these components within a specific community.

Common Domain of Interest

While early virtual communities congregated around a tightly defined common interest (Wenger, 1998), current virtual communities range from topic-specific communities to loose social ties or vague commonalities. However, an accepted and bounded domain of interest must exist in order to create and maintain a sense of community. Where no common domain is found, a group of users remains a random gathering of individuals that lacks a foundation for community building.

In some of the current social networks, such as Flickr, Last.Fm, or YouTube, it may be hard to pinpoint the source for SoC because these networks are characterized by complex structures of content and personal ties, but a shared domain of interest is a prerequisite for the establishment of a virtual settlement and the formation of emotional attachment. Taking Flickr as an example for a content-creating community, we can define the overall domain of the community as “photo sharing.” But within this all-encompassing definition, a flexibility exists that allows content creators (photographers) to publish and share artistic products, commenters to engage as being constructive contributors to an artistic process, and lurkers to enjoy the “legitimate peripheral participation” and learn from other photographers (Lave and Wenger, 1991). A different participation axis can also be found across content-related subcommunities (i.e., nature photographers, portrait photographers, etc.). It is within the common domain of photo-sharing interest that all the community-building activities become available and the feeling of affinity may emerge, albeit in a different manner for different members.

Continuous Interaction

Ongoing, continuous interaction is one of the paramount bases for the creation of a community (physical or virtual). Interaction brings together members, allowing them to create a rapport and strengthening the bonds among them, and between them and the community. Interaction in virtual communities has many facets, which range from exchanging practical information in a Q&A community (e.g., Yahoo! Answers) to exchanging emotional reactions toward a specific event (e.g., memorial groups on Facebook). Certainly, interaction cannot be unidirectional. If a person broadcasts his whereabouts on the Internet (as is commonly done in microblogging) without reciprocation, it will not create a community. However, if several others respond to the user and a conversation ensues, the interaction then becomes what Kollock (1999) termed “generalized reciprocation,” which helps to establish a stronger connection between members of the community.

Interaction is also used as currency in a virtual community in the sense that it contributes to the status of a member within the community. Gleave et al. (2009) found that members take upon themselves different roles when acting within their virtual community. Some preferred the role of “answer-people,” providing others with information, while others were “question-people,” mostly asking for information. In all these cases, interaction served to place a member within the community through role identification, which helps to establish a sense of belonging to a certain segment of the community. The importance of interaction, therefore, goes well beyond the creation of a virtual community at its domain onset, as it nourishes continuous emotional attachment and social recognition among community members.

Emotional Support

At its highest, the interaction among community members builds into an emotional gain to all members. The better emotional support a member attains, the stronger his or her SoC will be. Emotional support in a community is dependent on the community’s ability to sustain a nurturing and supportive environment. Although certain virtual communities thrive on conflict and flaming wars (e.g., political communities, some gaming communities), most successful virtual communities offer their members a relatively safe haven for expressing their opinions and getting emotional support from their peers. Trust among members is essential to promote empathy and affection, and is essential for ensuring healthy social interactions. Emotional support contributes to the level of intimacy and personal ties that users establish, especially in the communities that are created

within loose social networks (Gilbert and Karahalios, 2009). More important, emotional support extends beyond personal ties to encompass the ways in which a virtual community handles conflict and friction. It is a testament to the strength of its SoC. Carroll et al. (2003) termed the ability of the group to overcome conflict and attain its objectives as “collective efficacy.” Members of a community with higher collective efficacy will also have a strong SoC. This kind of community will be able to extend support to members in need, triumph over dissent, and cultivate intricate affectionate ties among its members and between its members and the community.

Shared History and Culture

Most physical communities are based on continuous shared history, pivotal occurrences, and dramatic instances that have shaped the community legacy. By comparison, the shared history in virtual communities is relatively shorter and ephemeral. Many virtual communities are short-lived, and even for communities that survive for long periods of time, change is imminent and becomes almost a natural part of the community life cycle. Interfaces change, new technologies are introduced, and content is added, edited, modified, or removed. These are difficult conditions to take on. Yet, virtual communities create their own version of shared history that may not be similar to that of physical communities. Pivotal events, such as flaming wars or interface changes (e.g., Facebook’s change of privacy controls) constitute historic events that the community reflects upon and discusses for relatively long periods of time. Joint activities (e.g., video candlelight vigils on YouTube) and communication through back channels (e.g., face-to-face meetings offline) foster a sense of closeness and points of reference for members of the community. Shared history in virtual communities may be considerably shorter than that typical of physical communities, but it is no less important than the prolonged history of physical communities. To the members of the virtual communities, even a brief collective memory of shared occurrences is sufficient to sustain a feeling of accord that contributes to a strong SoC.

Another aspect of shared history is shared culture. Language, symbols, rituals, etiquette, norms, and values that are accepted and practiced by the community members contribute to the SoC felt by members. In virtual communities, the importance of such practices may be even greater than in physical communities, as they provide a common conceptual ground by which community experiences are understood and used by members to facilitate and modulate their actions. Symbols that define the community’s identity and purpose, and events or rituals that affirm the community’s values (e.g., periodic listing of the community members or ranking of their contributions to the community) allow members to occasionally pledge their allegiance to the community and reaffirm their place within it. Virtual communities that have a well-established culture will also set specific expectations by which their members have to abide. For example, the use of certain terms or language may reveal a person to be a member of the community or an outsider (e.g., in patient-support communities, shorthand based on medical records will be used to describe the stage and length of the disease in a way that will not be understood by outsiders). The compilation of the various aspects of shared community history and culture provides the framework within which the community not only highlights major occurrences but also functions on a daily basis.

Virtually Constructed Identity

Individual identity started as being totally unimportant in virtual communities but grew to be essential. Anonymity was paramount in early virtual communities, in a way that allowed users to express hidden feelings and unorthodox views and to ignore common etiquette norms under

the guise of anonymous participation. In time, along with intense participation, even anonymous and pseudonymous contributors created identity and gained reputation of their own within the community (Turkle, 1997). The reputation, status, and role of a virtual persona are almost as important as the physical ones in establishing a SoC. Without knowing each other's virtual persona, trust can hardly be built and no shared history can be created. With members taking upon themselves different roles (e.g., moderator, "answer-person," mediator, and even flamer or troll), the community functions in a dynamic yet balanced way that encourages interaction and nurtures the sense of belonging.

A NEW FRAMEWORK OF SOC

We propose a framework of SoC that serves as the first attempt to integrate the aforementioned elements and capture the changing nature of SoC in virtual communities. The five elements described above constitute the building blocks for the new framework, which may be utilized in researching and developing SoC in various virtual environments. The framework is constructed along five shifts in the course of virtual community formation and development.

1. Topicality → Domain

While in earlier virtual communities topicality may have been indispensable in defining the boundaries of communities (hence, the sense of belonging to a certain community), today's virtual communities have much more flexible boundaries that are continuously defined by their members. A vaguely labeled domain of interest (e.g., video sharing, social networking), which may encompass a wide range of specific topics, becomes sufficient for the initial establishment of a virtual community. At a later stage in the community life cycle, topicality may become a catalyst in creating subcommunities of interest, which will generate an even stronger SoC that exists within the larger community. A common domain of interest implies the existence of relevant information in the community, which is the prerequisite of meaningful interactions that may eventually lead to a SoC.

2. Information → Interaction

Interaction in virtual communities goes beyond the act of information sharing and exchange. Certainly, any type of interaction in a mediated environment results in an information flow, yet focusing on interaction enables us to see how SoC is created and sustained as a dynamic process of online communication. People have different motivations to join a community, whether as a content creator, a critic/commenter, a casual observer, or a personal friend of an existing community member. These motivations lead to different needs of the community participants that can only be satisfied by interacting with fellow members or the community as a whole. By establishing a link between information sharing and the interaction that ensues, SoC is highlighted as a force that drives the community from a mere information exchange platform to a personal social space.

3. Information → Affection

Previous research has indicated that repeated interaction over time with others helps trust to evolve. The more one interacts with others and discloses personal information, the more others will reciprocate to build mutual trust. Not surprisingly, once trust is established, more affection-

driven interactions will occur. Empathy and other affective responses are often seen in virtual communities where members reported a strong SoC (Preece, 1999; Welbourne et al., 2009). In affection-driven interactions, information is used not only to facilitate discussion or knowledge transfer in the shared domain but also to transcend the interaction into a higher level of reciprocal affinity, establishing a stronger SoC.

4. Story → History

The creation of shared history and culture starts from the moment a community is actualized. Although interaction in virtual communities is often ad hoc and ephemeral, digital media have the advantage of preserving and tracing the fleeting moments of interactions that may become part of pivotal events in the community history. The digital traces help to construct a coherent narrative of common values that the core members of the community abide. In virtual communities, an open collection of stories and artifacts tells a shared history that sustains a feeling of affinity. Shared history is extremely important for active participants and “lurkers” alike. When historical interactions are preserved and easily accessible, lurkers are able to learn about the community culture and acquire the shared values without direct involvement in community interactions.

5. Anonymity → Identity

It is well known in social science that an established identity in a social group promotes a sense of coherence and continuity for group members (Goffman, 1959). While in many social-networking communities the real identity of a participant is often revealed, the famous adage “on the Internet, nobody knows you’re a dog” still captures the general anonymity of many online interactions. Nonetheless, recent research has found that any type of visual representation of identity (a photo, avatar, or signature of the user) in virtual environments promotes recognition and identity creation within the community. That is, members of virtual communities may represent themselves with digital means that carry the same connotations of personal identities in real life. Furthermore, the virtual identities are constantly (re)constructed and reinforced in the process of ongoing interactions within the community, and specifically through a reification process involving various levels of participation in the community life.

The proposed framework highlights some of the SoC elements as discussed in prior literature and emphasizes the changing connotations of others. It acknowledges the transformative properties that characterize virtual communities and their inherent variance.

One must note that SoC is likely to be viewed and experienced in a different way by different members of the same community, as well as by members of different types of virtual communities. The five shifts in SoC formation may also manifest differently in various degrees during the life cycle of the community. Researchers must examine SoC in the context of existing variances of virtual communities and acknowledge the fact that SoC is an elusive term that is difficult to generalize from a single empirical study to others due to the huge variations of structure, characteristic, and heuristics. Moreover, different research perspectives, stemming from each of the five shifts, may yield alternative or even conflicting viewpoints and understandings of the specific community’s SoC. On the other hand, the five shifts in the framework provide a set of anchor points with which SoC researchers may align their work. We encourage virtual community researchers to move beyond the traditional conceptualization of community and examine the emergence of SoC within virtual settlements that are bounded by broad domains of interests. For such a virtual settlement, researchers should move beyond the mere structure of ties and information transfer,

and look for meaningful and affection-driven interactions that lead to a high level of participant recognition and personal identity disclosure. Researchers should also pay attention to stories being circulated, recurring themes in the digital artifacts being produced, and common values being reiterated and defended by members of the virtual settlement. Although it is hard for researchers to capture and define the exact qualities of SoC for each virtual community, we can safely assume that established boundaries and mechanisms of meaningful interaction, together with a coherent narrative of the community's history, produce a strong sense of community shared by the community members.

CONCLUSION AND FUTURE RESEARCH

This chapter contributes to the discourse of SoC through a dialogue with "classic" SoC theories as well as more recent online community research. Building on McMillan and Chavis's work, we identify five elements of SoC (common domain of interest, continuous interaction, emotional support, shared history and culture, and virtually constructed identity) and propose a new framework for understanding the changing nature of SoC in today's virtual environments. In a nutshell, we argue that an SoC in virtual environments may thrive through meaningful (either informational or emotional) interactions among active participants who mutually recognize each other and identify themselves with the community heritage. Meaningful interactions should be carried out using established routes of communication, which promise to deliver both the needs and the responses of the members so that affinity is built and engagement is sustained.

An immediate challenge to any conceptual framework is its empirical validity and how its latent constructs are measured. Since SoC cannot be indirectly observed, we need to identify a set of indicators that estimate the existence and intensity of SoC. Given the variations of virtual communities and their ever-changing nature, the identification and measurement of SoC indicators can be a daunting task. While Chavis et al.'s (1986) "sense of community index" (SCI) was adopted in several studies, researchers have been debating to this day the validity of the SCI's measurement scales and the way the index should be implemented in different research settings (see Chipuer and Pretty, 1999; Hill, 1996; Nasar and Julian, 1995). For example, the lack of differentiation between geographical communities and communities of interest in the SCI is particularly problematic, as virtual community members are usually not geographically bonded. Future research is much needed either to extend the SCI or to inductively develop a new SoC index so that a standard tool for measuring SoC can be established.

Another closely related issue is the dynamics between the SoC and the SoC elements. Previous literature has suggested conflicting views with regard to whether the feeling (SoC) causes the observed elements, or the elements cause the feeling, or the two emerge together. These causal links can only be assessed across different virtual communities with a standard SoC instrument. Once a valid and reliable SoC measurement is in place, we then need to translate theoretical understandings of SoC into virtual community design practices. An incremental accumulation of empirical studies may help to advance our knowledge about how to evaluate a virtual community's SoC design and how SoC can be promoted through improving the design.

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