Development and Initial Validation of a Social Capital Scale for Online Learning

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Abstract

Online networks of social interaction differ based on context and goals of individuals, suggesting that there may be nuanced ways of conceptualizing and studying social presence. We propose using social capital theory as a means to study the dimensions of social presence, rather than envisioning social presence as a unitary construct. We report on our validation of a social capital scale for online learning and speculate on the ways in which this scale can inform social presence.

Purpose and Perspective

Scholars have long argued that learning is simultaneously an individual and social process (Brown, Collins, & Duguid, 1989), situated in its social context (Lave & Wenger, 1991). This understanding “reconceptualizes learning from an in-the-head phenomenon to a matter of engagement, participation, and membership in a community” (Nasir & Cooks, 2009, p. 42). Research suggests that the importance of such social interactions remain important in online communities. For instance, online learning literature indicates significant correlations between social interactions and course grades (Shea, Fredericksen, Pickett, Pelz, & Swan, 2001), satisfaction (Gunawardena & Zittle, 1997), overall performance (Picciano, 2002), and perceived learning (Rovai, 2002; Richardson & Swan, 2003). Taken together, these studies suggest that active participation in learning communities is central for the success of online pedagogies. What mediates between the self and the community – between the personal and social – is operationalized as social presence.

Social presence is defined as the degree to which individuals represent themselves (Rourke, Anderson, Garrison, & Archer, 1999) and perceive others in mediated environments (Biocca, Harms, & Burgoon, 2003). Much online learning research posits that a sense of social presence is important for individuals to form social ties and develop relationships within an online community (Rovai, 2002). Despite these benefits, however, we know relatively little about how social presence plays a role in the formation of social ties or interactions within a community. We do not know how social presence is manifested at the community level and how this
manifestation relates to different interaction patterns. What is the relationship between social presence and types of social relations and interaction patterns?

We suggest that social capital theory may hold some answers. As the central tenet for social capital theory is that different relationships within networks of people hold different values (Dika & Singh, 2002), we argue that it can inform the ways by which social presence is understood with respect to interaction patterns.

Bourdieu (1986) defined social capital as “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition” (p. 249).

According to Putnam (2001), two types of social capital are most prominent: bridging and bonding. Bridging social capital refers to relationships with people from other communities, cultures, or socio-economic backgrounds. Typically, bridging social capital provides “a basis for collective action” (Pigg & Crank, 2004, p. 68) by allowing individuals to “share their histories and experiences, as well as establish their common values and prosocial goals” (Tseng & Kuo, 2010, pp. 1044–1045). Indeed, similar claims - though not explicitly referring to bridging social capital - can be found in social presence research (Garrison, 2006; Rovai, 2002). For instance, research suggests that social presence in online learning environments “ha[s] to do with getting to know each other [and] committing to social relationships… [because] if group members are initially not acquainted with each other and the group has zero-history (which is often the case in distance education institutions), then group forming, developing a group structure, and group dynamics are essential to cultivating a learning community” (Kreijns, Kirschner, & Jochems, 2003, p. 342). We argue, then, that bridging social capital can help to explain the relationship between diverse social interactions and social presence in online learning environments.

Bonding social capital refers to the strong ties of attachment between relatively homogeneous individuals. Individuals with similar interests or backgrounds develop higher levels of bonding social capital (Lesser & Prusak, 2000), which leads them to establish meaningful peer relationships (Tseng & Kuo, 2010; Wasko & Faraj, 2005). These stronger relationships, then,
provide important environmental conditions for knowledge exchange (Chiu, Hsu, & Wang, 2006) by allowing information to flow throughout the existing social contacts (Fetter et al., 2010). Bonding social capital, therefore, improves the acquisition of knowledge and fosters learning in a community (Daniel, Schwier, & McCalla, 2003; Kanawattanachai & Yoo, 2007). As with bonding social capital, social presence research demonstrates that for individuals to recognize collaboration as a valuable experience and to understand their peers’ ideas, critiques, or suggestions, certain conditions, such as a sense of affinity, belonging, and closeness, should be satisfied (Garrison, 2006).

We seek to use social capital theory to understand how social presence is related to the formation of social ties or interactions within an online learning community. In the present paper, we begin this work through the adaptation and validation of a social capital scale to the context of online learning.

**Methods and Data Sources**

We collected data from 198 students from 11 fully online courses over 5 terms between September 2011 and December 2013, in a large North American research university. The courses are offered through our in-house online learning environment, which allows both asynchronous threaded discussions and synchronous communication tools. The courses each comprised twelve modules in which students discussed instructor-assigned readings. Each week, one or two students acted as moderators: they collaborated with each other in advance to develop guiding questions for the week, facilitated discussion throughout the week, and finally offered a summary of the week’s issues.

We administered a Likert-type online survey with five-point questions. We measured students’ perceived level of social capital by assessing the nature and value of social ties and relationships that students hold in their online learning communities. The questionnaire comprises two subsections: one on bonding social capital and one on bridging social capital. The social capital
questionnaire was adapted from an information studies instrument (Choi, Kim, Sung, & Sohn, 2011) and is built upon the online social capital scale (Williams, 2006, 2007) and the relationship development scale (Parks & Floyd, 1996; Parks & Roberts, 1998).

**Results**

The social capital instrument has not been used in the online learning literature previously; thus, we conducted validity and reliability tests on the instrument. Based on the expected factor structure and an investigation of parallel plots, we carried out an exploratory factor analysis using two factors. Missing responses were replaced by item means and an item was retained in the factor only when it loaded greater than 0.4 on the relevant factor and less than 0.4 on the non-relevant factor. The factor analysis with Varimix rotation and with Kaiser normalization confirmed bridging and bonding social capital as distinct factors (Table 1), explaining 54 percent of the total variance in social capital. Though our sample size is small, the literature suggests that factor analysis is legitimate when each factor has four or more loadings of at least 0.6 (Guadagnoli & Velicer, 1988). Note that two items (marked by asterisks) load high on both of the factors, and deleting one item (marked by double asterisks) yields a statistically significant Cronbach's Alpha score for factor two.

Table 1: Factor Analysis and Cronbach's Alpha scores for Bridging and Bonding Social Capital in Online Learning Environments

<table>
<thead>
<tr>
<th>Factor 1: Bridging ($\alpha = .889$)</th>
<th>Factor Loadings</th>
<th>$\alpha$ if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Item Wording</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Interacting with my peers in the course makes me interested in things that happen outside of my own life</td>
<td>.591</td>
<td>.885</td>
</tr>
<tr>
<td>2 Interacting with my peers in the course makes me want to try new things</td>
<td>.742</td>
<td>.873</td>
</tr>
<tr>
<td>3 Interacting with my peers in the course makes me interested in what people unlike me are thinking</td>
<td>.684</td>
<td>.879</td>
</tr>
<tr>
<td>4 Talking with my peers in the course makes me curious about their working environment /profession / research interests</td>
<td>.764</td>
<td>.878</td>
</tr>
</tbody>
</table>
Interacting with my peers in the course makes me feel like part of a larger community

Interacting with my peers in the course makes me feel connected to the bigger picture

Interacting with my peers in the course reminds me that everyone in the community is connected

I am willing to spend time to support general community activities in the course

Interacting with my peers in the course gives me new people to talk to

Factor 2: Bonding ($\alpha = .561$)

<table>
<thead>
<tr>
<th>Item</th>
<th>Item Wording</th>
<th>Factor Loadings</th>
<th>$\alpha$ if Item Deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I developed at least one friendship in whom I would confide my problems</td>
<td>.708</td>
<td>.458</td>
</tr>
<tr>
<td>2</td>
<td>I was able to make friends who I can turn to for advice about making very important decisions</td>
<td>.735</td>
<td>.457</td>
</tr>
<tr>
<td>3</td>
<td>There is no one in the online course that I feel comfortable talking to about intimate personal problems</td>
<td>.553</td>
<td>.753**</td>
</tr>
<tr>
<td>4</td>
<td>When I feel lonely, there are some people in the online course I feel I can talk to</td>
<td>.796</td>
<td>.425</td>
</tr>
<tr>
<td>5</td>
<td>If I needed an emergency loan of some small amount of money, I know someone in the course I can turn to</td>
<td>.636</td>
<td>.496</td>
</tr>
<tr>
<td>6</td>
<td>At least one of my peers I interact with in the course would put his/her/their reputation on the line for me</td>
<td>.787</td>
<td>.449</td>
</tr>
<tr>
<td>7</td>
<td>At least one of my peers I interact with in the course would provide good job references for me</td>
<td>.694</td>
<td>.435</td>
</tr>
<tr>
<td>8</td>
<td>At least one of my peers I interact with in the course would share his/her/their professional knowledge / expertise with me</td>
<td>.507</td>
<td>.500</td>
</tr>
<tr>
<td>9</td>
<td>I do not know anyone in the course well enough to do an important course assignment / project with them</td>
<td>.424*</td>
<td>.693</td>
</tr>
</tbody>
</table>
The people I interact with in the course would help me fight an injustice.

N=198, * High factor loadings for both factors, ** Significant positive change in alpha score if deleted

Table 1 represents the validity and reliability analysis of the social capital questionnaire in general but does not inform us about the reliability of bridging and bonding social capital as distinct factors. Thus, we further analyzed the inter-item correlations of bridging and bonding social capital (Table 2). Above the diagonal line represents the inter-item correlations for bridging social capital whereas below the diagonal line represents the inter-item correlations for bonding social capital. Table 2 indicates that only two items have problematic inter-item correlation coefficients (r >= 0.6) (Piedmont & Hyland, 1993).

Table 2: Inter-item Correlation Matrix For Bridging and Bonding Social Capital

<table>
<thead>
<tr>
<th>Item</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>--</td>
<td>.255</td>
<td>.462</td>
<td>.107</td>
<td>.284</td>
<td>.395</td>
<td>.398</td>
<td>.291</td>
<td>.370</td>
<td>.032</td>
</tr>
<tr>
<td>2</td>
<td>.246</td>
<td>--</td>
<td>.446</td>
<td>.331</td>
<td>.395</td>
<td>.449</td>
<td>.440</td>
<td>.437</td>
<td>.486</td>
<td>.296</td>
</tr>
<tr>
<td>3</td>
<td>-.189</td>
<td>-.253</td>
<td>--</td>
<td>.359</td>
<td>.282</td>
<td>.385</td>
<td>.426</td>
<td>.391</td>
<td>.366</td>
<td>.318</td>
</tr>
<tr>
<td>4</td>
<td>.228</td>
<td>.325</td>
<td>-.441</td>
<td>--</td>
<td>.411</td>
<td>.372</td>
<td>.431</td>
<td>.453</td>
<td>.402</td>
<td>.308</td>
</tr>
<tr>
<td>5</td>
<td>.201</td>
<td>.271</td>
<td>-.170</td>
<td>.469</td>
<td>--</td>
<td>.109</td>
<td>.194</td>
<td>.213</td>
<td>.462</td>
<td>.269</td>
</tr>
<tr>
<td>6</td>
<td>.376</td>
<td>.415</td>
<td>-.369</td>
<td>.533</td>
<td>.481</td>
<td>--</td>
<td>.392</td>
<td>.493</td>
<td>.402</td>
<td>.281</td>
</tr>
<tr>
<td>7</td>
<td>.460</td>
<td>.479</td>
<td>-.374</td>
<td>.442</td>
<td>.306</td>
<td>.421</td>
<td>--</td>
<td>.327</td>
<td>.484</td>
<td>.199</td>
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<td>8</td>
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<td>-.485</td>
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<td>-.337</td>
<td>-.081</td>
<td>-.225</td>
<td>-.301</td>
<td>-.474</td>
<td>--</td>
<td>.364</td>
</tr>
<tr>
<td>10</td>
<td>.381</td>
<td>.331</td>
<td>-.088</td>
<td>.402</td>
<td>.319</td>
<td>.407</td>
<td>.464</td>
<td>.491</td>
<td>-.336</td>
<td>--</td>
</tr>
</tbody>
</table>

* High inter-item correlation

Based on the validity and reliability analysis represented in Table 1 and Table 2, we removed item 9 in bridging social capital as well as items 3 and 9 in bonding social capital in order to satisfy the validity and reliability of the questionnaire. To summarize, after the validity and reliability tests, our bridging social capital questionnaire has 9 items (α = 0.889) and bonding social capital questionnaire has 8 items (α = 0.753).
Significance and Discussion
Contemporary theorizing on social presence in online learning conceptualizes social presence as a multi-dimensional construct. Yet, current literature does not investigate the ways in which social presence might be differentiated according to community interaction patterns (Oztok et al., 2013). That is, scholars have delineated social presence along dimensions related to the person, but not to the community. As a step toward addressing this gap, we have adapted a social capital scale and validated it for an online learning context.

How might our scale be used? Contemporary theorizing on social presence in online learning conceptualizes social presence as a multi-dimensional construct. Yet, current literature does not investigate the ways in which social presence might be differentiated according to community interaction patterns (Oztok et al, 2013). Using our scale, we are currently investigating relationships between the two dimensions of social capital and measurements of social presence. This will inform our theorizing on the ways that social presence manifests and influences relationships on the level of the community, rather than the level of the person.

Conclusion
Online learning researchers must be increasingly careful in addressing the social aspects of learning and consider the quality of social ties and the density of social relationships within a community. We have argued that it is insufficient to operationalize social presence as a measure of relevance at only the individual level. Social presence has community implications; we urge online education researchers to incorporate this perspective in studies and scales of social presence. To that end, we offer here a scale for measuring social capital in online learning, and have offered a validation argument for the scale. We hope the scale proves useful as we broaden the scope of social presence.


Kanawattanachai, P., & Yoo, Y. (2007). The impact of knowledge coordination on virtual team...


on Behavior and Society, 10(3), 398–406. doi:10.1089/cpb.2006.9939