Online credibility and community among blog users

Jeanine Finn
School of Information
University of Texas at Austin
1616 Guadalupe Suite #5.202
Austin, TX 78701-1213
jefinn@ischool.utexas.edu

Homero Gil de Zúñiga
School of Journalism
University of Texas at Austin
1 University Station A1000
Austin, TX 78712-0115
hgz@mail.utexas.edu

ABSTRACT
This study is based on a secondary analysis of data from a survey of U.S. adults related to informational media use, trust, and community engagement. The authors were interested in determining if the act of contributing to online information sources (blogs, in this case) was correlated with higher expressions of trust in "alternative" or citizen-journalism sites. While familiarity with these sites has often been shown to correlate with higher trust measures, isolating participatory behavior from reading/use behavior is a particular question that has not been much addressed in the literature. Several survey responses related to online behaviors and attitudes were examined, and contributor users were found to be more likely to rate alternative media sites (with user-contributed content) as credible than other users. This effect was consistent even when controlling for demographic factors or otherwise generally advanced online information use. Content contributor users were also found to score slightly higher on measures of off-line social capital. This conclusion suggests an area for future research into the norms and motivations behind the development of collaborative information resources, and better analysis of the role of trust or credibility in explaining why some types of online resources (wikis, blogs, digital libraries, etc.) succeed and flourish, while others do not.

Keywords
Blogs, credibility, trust, social capital, collaborative information

INTRODUCTION
From early academic worry about "increased opportunities for disinformation and misinformation" online (1995, p. 134) to later reflective discussions about the changing authoritative roles of publishers and librarians (Fritch & Cromwell, 2001; Wittenberg, 2007), there is ample evidence of widespread concern about the credibility of "stuff you read on the Internet." Meanwhile trust in professional journalism, historically a resource for reporting contemporary "truth," declines steadily (Project for Excellence in Journalism, 2007), and it seems a canyon of a credibility gap yawns between the networked humans of the 21st century and all the digitized texts now at our disposal. Currently, discussions in popular culture suggest some type of post-modern surrender to a world where online facts are just "true enough" to be believed (Manjoo, 2008)…but not really true at all.

As part of continual efforts to address these concerns, decades of scholarship on credibility from both communication and information science fields has frequently resulted in the establishment of models and proposed heuristics to explain why humans trust the information they do. These models have informed further investigations, but are still a work in progress that has not fully captured the nature of the interactions happening in the digital world. While communication scholars traditionally look at the psychology of the inter-personal encounter (Goffman, 1959) to explain trust and credibility, information science scholars have been inclined to see credibility as attributable to the source itself, either through its organizational or social provenance or the credentials of its author (Flanagin & Metzger, 2008, p. 8; Hilligoss & Rieh, 2008; Oxley, Morgan, Zachry, & Hutchinson, 2010). These models, though, are struggling to accommodate the measures necessary for assessing online credibility in a hyperlinked information world.

Where both of these types of models seem to fall short is in their understanding of the *social context*. Do we know exactly happens when online information sources are not merely texts on a screen, but an environment that supports rich interactions with our fellow humans? Do we understand "trust" in information differently, if it is a text we contributed to, or that "friends" have contributed to? While we can expect that people will trust their own words, does a participatory Web 2.0 culture suggest broader implications for information trust, as well as suggest trust patterns (as articulated in social capital measures) for the offline world?

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We know participation (whether civic, political, or with respect to the use of an online resource) is related to trust (Putnam, 2001; Shah, 1998). Trust is an antecedent, a product, and a mediator of interactions. These interactions may leave behind "information structures" – whether in formal (for example, collaborative digital libraries) or informal (blogs) knowledge-sharing structures. This study has been undertaken to begin to isolate the particular power of participatory behavior (apart from mere reading familiarity with a resource) in establishing trust, and how those trusting behaviors can support a successful information structure.

RELATED WORK

Perspectives on credibility and trust in a networked digital environment

The issue of credibility has been a consistent concern since widespread access to Internet information came to mean that large sections of the population, not just the most educated and most technologically-competent, would be using these resources (for example, Viehland, 1993). Credibility research, traditionally based in philosophical or epistemological examinations, has been a theme in the research of several disciplines within the social sciences for decades, developing both proposed cognitive models and rigorous descriptions of source criteria that support positive trust judgments. But the changed information environment of the post-Internet world, has, in a sense, "turned the volume up" on some of these questions and offers both a more complex, and a more rewarding field for study.

Cognitive perspectives

Emerging, in part, from cognitive psychology as well as communications research, there is a large body of work that proposes to examine how credibility is granted by an individual engaged in an information negotiation. Patrick Wilson lays the foundation for much of the later work in this area (1983). Wilson's work, while developed in a mostly pre-digital era, remains seminal for several key reasons. Principally, for this study, there are two important notions. First, humans treat first-hand knowledge differently than second-hand knowledge, and we tend to prefer it. Secondly, that information which requires us to ascribe some authority to the source (second-hand knowledge), is highly context-dependent and relates to our social understandings and cultural norms. In this way, Wilson's work reflects the tradition of positivist epistemology that continues to influence how humans think they come to know things (through experiences), while at the same time, allowing for the richness of embedded social contexts and a multiplicity of views in a knowledge-gathering activity. This continues to be a useful framework around which to build and understanding of credibility in the digital world.

There continue to be lines of research that seek to understand what kind of cognitive frameworks underlie individual credibility decisions, in the hope of creating a model that can account for the flexible decisions and seemingly contradictory nature of much networked human information behavior. Individual characteristics related to epistemological "development" have been examined (Whitmire, 2004), and have supported conclusions about higher levels of epistemological development being necessary to support appropriate self-reflective information behaviors that can properly evaluate several different sources of information. Multi-level models of processing have also been advanced (Flanagin & Metzger, 2007; Hilligoss & Rieh, 2008) which suggest that credibility decisions may emerge from both a flexible heuristics structure, that allows for rapid and re-iterative credibility judgments, as well as high-level construct- and context-level evaluations that are more dependent on individual cognitive attributes as well as social and cultural factors.

Many cognitively-focused studies of credibility judgments suggest that intention plays a role in the assessment, and that not all online information-related activities are processed in the same way. Unsurprisingly, credibility concerns are more likely to be an issue for purposive information activities online (Rieh & Hilligoss, 2008) than for other types of activities. Even within the same type of source, the act of engaging with that source with a specific information goal can change credibility assessments. For example, blogs are more likely to be considered credible by purposeful information seekers than casual readers (Armstrong & McAdams, 2009; Johnson, Kaye, Bichard, & Wong, 2007).

Also unsurprisingly, increased exposure to an online information source can support increased reader trust. However, less clear is the nature of that positive correlation. A reliability model (Rieh & Belkin, 1998) suggests that frequent exposure to multiple distinct sources online allows for confirmation of information. Repeated exposures to the same information from different sources can support a positive judgment about the information's trustworthiness. References and links from other sources can help to corroborate initial judgments (Kelton, Fleischmann, & Wallace, 2008) and engender trust -- seen as a mediating variable between information encountering and information use.

Source-focused perspectives

While some scholars have worked to better understand the cognitive work of human credibility judgments, other areas of research work to identify specific components of the information source or medium that are likely to correlate with positive trust judgments. Specific features of the message(s) expressed by the text, as well as particular visual features and technological affordances of

the medium are all implicated in human credibility assessments. Numerous studies have attempted to capture (via surveys, observations, and other ethnographic methods) what these features may be.

Traditional markers of authority in the offline world have been shown to matter a great deal to online information seekers. Gender, for example, may play a role, as online information authored by males is more likely to be judged credible than that authored by females (Armstrong & McAdams, 2009) . Well-known brand names and logos can affect credibility assessments on consumer health sites (Robins, Holmes, & Stansbury, 2010). News sites affiliated with well-known media brands are frequently judged more credible than their independent counterparts (Chung, Kim, & Kim, 2010; Flanagin & Metzger, 2007; Gunter, Campbell, Touri, & Gibson, 2009). Even in an information environment where trust in traditional news media is considered to be declining (Project for Excellence in Journalism, 2007), the reputation of a traditional news organization confers considerable authority. This effect has been shown to persist even among online participants who might be considered to be the most engaged in creating new roles and new standards for information exchanges – bloggers (Johnson & Kaye, 2004; Johnson et al., 2007).

Some of those who are most concerned about issues of credibility of online information often posit a solution that suggests online information participants are lacking in critical skills needed to evaluate appropriate authority markers (Fritch & Cromwell, 2001) and could benefit from more formal instruction and guidelines in how to evaluate source credibility (Daniels, 2010; Flanagin & Metzger, 2008). Some who favor this approach agree it could be useful, but are less optimistic about "training" humans in source evaluation and suggest that the checklists be short and or nearly "invisible to the user," (Metzger, 2007). There is, in fact, ample evidence of a disconnect between the rigorous evaluation of sources that people feel is appropriate in the online world, and the quick, flexible judgments they actually end up executing in practice (Flanagin & Metzger, 2007; Hilligoss & Rieh, 2008; Lackaff & Cheong, 2008).

This "disconnect" suggests the inherent complexity of the evaluation activity. When text is hyperlinked, repurposed, consolidated, and aggregated in a multitude of ways, the concept of "source" becomes nearly meaningless (Lucassen & Schraagen, 2010; S. Shyam Sundar, 2008; S. S. Sundar & Nass, 2001). For example, in the case of a link posted anonymously to an unmoderated discussion forum on a small newspaper's version of a syndicated news wire story…where is a reader to begin to parse and judge those different source identities?

In addition to the perceived "quality" of the source, the affordances of the technological medium through which the source is accessed can also influence credibility judgments. Experimental research frequently confirms the finding that visual aspects of the digital information source influence quality judgments, and that well-designed resources are more likely to be considered "reliable," (Fogg et al., 2003; Robins & Holmes, 2008; Robins et al., 2010). Beyond just the aesthetic elements, other features of a site can inspire trust. Particularly among youth, interactive elements on a site can provoke higher credibility assessments (S. Shyam Sundar, 2008).

A networked perspective

Given, then, the complexity of articulating a cognitive model that can capture the heuristics and constructs that humans use in making credibility assessments in online information exchanges, and the shortcomings of creating a universal description of all the source-based evaluations in a digital (and highly visual and interactive) environment, a more fruitful path of analysis might allow for a "networked" understanding of credibility. The embrace of new forms of information technology, simultaneous with continued belief in indicators of "traditional" authority, suggest that humans' credibility judgments may be more bound up with the emergent "how" of information behavior rather than the static "what." That is, the social constructs that surround an information exchange, and how they change over time, may have a much greater influence over credibility judgments than any articulated heuristic.

The role of networks in supporting credibility assessments can be understood, in part, through the lens of social capital concepts. "Social capital," while a useful theoretical tool, is an inherently complex and problematic concept. Robert Putnam's definition of social capital, which associates social capital with "civic virtue," allows for variations along the dimension of bridging (inclusive) versus bonding (exclusive) forms of social capital (Putnam, 2001, pp. 19-21). His view is perhaps the most well-used in current conversations, but critical perspectives can highlight the inequalities that a system of social capital can perpetuate (Bourdieu, 1986). Without taking a normative stance, and while acknowledging the complexity of the "social capital" term, this study has benefitted from an understanding the concept articulated by Nan Lin (1999). His theory of social capital proposes a model that has particular utility for the understanding of credibility judgments in an online environment. Specifically, his model allows for "expressive returns" on social capital as well as merely instrumental returns from engagement. Furthermore, this model also allows for an understanding of social capital that considers the resources embedded and used – not merely the networks and human relations.

Currently, there are a number of examinations of online participatory behavior which make useful application of a

networked understanding of online credibility judging behavior. The case of Wikipedia has received particular attention, as its scale (in terms of text resources and participants) as well as the credibility concerns it inspires are unique. The culture of collaboration around Wikipedia (Reagle Jr., 2010) has suggested that it is the very human norms of civility, respect, and "assuming good faith" that enable large-scale information collaborations to be successful. And Wikipedia does seem to be successful. While assessments of Wikipedia's overall accuracy are mixed (Giles, 2005) some would argue that it may be our measurements that need some adjusting, as the norms themselves related to "accuracy" may be shifting as well (Luyt & Tan, 2010). Models of what constitutes "correct" or "reliable" information seem fungible, and openness and interpretability (i.e., "are there many people that say this?" rather than "is this the absolute truth?") is posited as part of a new paradigm for authenticity (Baumer, Sueyoshi, & Tomlinson, 2008; Del Giudice, 2010; Wittenberg, 2007). Wikipedia's reference system and its highly visible links to other sources are seen as a strength (Lopes & Carriço, 2008; Lucassen & Schraagen, 2010), while the lack of identifying information for contributors and editors is a matter of some concern (Santana & Wood, 2009).

In addition to the case of Wikipedia, blogs generally are seen as a demonstration of the workings of networked social capital and trust. While blogs and bloggers may have been initially dismissed or poorly understood by researchers, the most recent studies suggest that blog readers are involved in a variety of offline and online participatory behaviors, and that these behaviors are mutually supportive and meaningful (Gil de Zúñiga, Veenstra, Vraga, & Shah, 2010; Shah, Cho, Eveland, & Kwak, 2005). Additionally, technical affordances such as trackback, blogrolls, and links allow for visible demonstration of networked credibility (Marlow, 2004).

Consistent throughout all of these examinations is the notion that trust is both an antecedent *AND* a product of engagement with an information network. Information exchanges are trusted because they are frequent (Johnson & Kaye, 2000)…they may become more frequent as they are seen as more reliable. This suggests then, an understanding of "information trust" that is emergent over the course of interactions and resident in networks and communities rather than static definitions.

This study is undertaken in order to begin to isolate whether or not a contributory type of engagement with networked information sources (as opposed to an engagement as just a reader or consumer) results in greater trust, both with respect to online information and with respect to general measures of social capital.

HYPOTHESES AND RESEARCH QUESTION

Given that repeated exposure and increased familiarity with online resources are shown to correlate with increased trust:

H1*: Advanced internet information use will correlate with higher trust measures for online news media.*

Furthermore, since research into contributory web use (such as writing for blogs and Wikipedia) show that there are norms of trust that grow out of the specific affordances of the site, as well as the personal relationships around it:

H2: *Content contributor users will show more trust in alternative (user-created) news sites than advanced information users.*

Finally, is there a statistically significant relationship between levels of content contributions online and measures of offline social capital or community engagement?

RQ1: Does a higher level of content contributions online correlate to a higher score on an index measure of (offline) social capital?

METHODS AND MEASURES

This data was gathered from an online survey administered between December 2008 and January 2009 by the Community Journalism & Mass Communication Research (CJCR) collective at the University of Texas at Austin. This 200+ question survey examined questions of information and media use and civic engagement among U.S. citizens. A random draw of 10,000 individuals was matched to Census-type characteristics to comprise an representative population sample on measures such as ethnicity, age, income, and education (females were slightly over-represented in the sample). Accounting for invalid email addresses and non-responses, the survey garnered a total of 1,159 responses to all 219 items (200 had missing values for variables of interest for this analysis) for a final response rate of 22.8%, which is within the standard acceptable range for this type of survey (Kaplowitz, Hadlock, & Levine, 2004). Population characteristics are described by Table 1, below.

This secondary analysis uses several composite indexes (and one single-measure variable) to operationalize the independent and dependent variables for this study.

The advanced information use variable was created to establish a measure of advanced, purposeful, information-seeking (distinct from online activities such as basic email use, online shopping, and the use of social network sites,

	All respondents (n = 959)	Advanced information user* (n=495)	Contributory user** (n = 233)
Age			
18-24	34(4%)	9 (2%)	13(6%)
25-34	181(19%)	108 (22%)	54(23%)
35-44	207(22%)	121 (24%)	53(23%)
45-54	288(30%)	138 (28%)	66(28%)
55-64	196(20%)	95(19%)	44(19%)
65+	53(6%)	24 (5%)	3(1%)
Education			
No HS diploma	6(1%)	2(0%)	0(0%)
HS Grad	142(15%)	36(7%)	30(13%)
Some college	269(28%)	113(23%)	62(27%)
2-year degree	103(11%)	45(9%)	28(12%)
4-year degree	254(26%)	156(32%)	70(30%)
Graduate degree	185(19%)	143(29%)	43(19%)
Gender			
Male	316(33%)	172(33%)	73(31%)
Female	643(67%)	323(63%)	160(69%)
Race			
White	809(84%)	397 (80%)	193(83%)
African-American	48(5%)	34 (7%)	16(7%)
Hispanic	43(4%)	26 (5%)	5(2%)
Asian	29(3%)	17 (3%)	10(4%)
Other	30(3%)	4 (1%)	9(4%)
Income			0%
Under $20K	116(12%)	49(10%)	30(13%)
$20K - $59,999	388(40%)	171(35%)	85(36%)
$60K- $99,999	253(26%)	141(29%)	63(27%)
$100K- 149,999	139(14%)	90(18%)	39(17%)
$150K+	62(6%)	43(9%)	16(7%)

Table 1 : Characteristics of all respondents, advanced information users, and contributory users

*** x > M**
**** x > 0**

was created from the mean of three survey responses that asked about the frequency of internet use for: 1.) getting information for work or school, 2.) using a search engine, and 3.) finding difficult information. These measures were scored on a 10-point Likert scale, with 1="never" and 10="all the time." For the purposes of Table 1, "advanced information users" were those whose scores were above the mean for this index.

The contributory use variable was operationalized by including responses to three survey measures that asked about: 1.) posting comments on others' blogs, 2.) writing posts on one's own blog, and 3.) linking to others' blogs. These measures were scored on a 10-point Likert scale, with 1="never" and 10="all the time." The three survey measures (α = .80, M = 4.96, SD = 2.74) were averaged to create the contributory use variable. For the purposes of Table 1 "contributory users" were those whose scores were greater than 0 for this index.

The descriptive statistics of Table 1 highlight the fairly minimal differences between the advanced information user and contributory user population, as well as between both of these groups and the overall sample.

The dependent variable, alternative media trust was an index created from the average of two measures (r = .38, M=3.71, SD =2.30) that asked for a rating (on the same 10-point Likert scale) of how frequently the respondent trusted alternative news sources online. The first question asked, in the context of a series of questions related to trust in political news sources, about trust in alternative media online such as blogs and citizen journalism. The second question, in the context of a series of questions related to blogs, asked for a response to "I trust the information I get on blogs."

The social capital index was created from an average of 11 measures using again the same 10-point Likert scale (α = .91, M = 5.62, SD = 1.75) asking about agreement with such statements as, "People in my community watch out for each other," and "In my community, we talk to each other about community problems," (see Appendix A for complete listing of survey questions). Two items within this set were reverse-coded. While the idea of social capital is the subject of many different interpretations, the concepts articulated by these 11 measures seemed broadly relevant to many recent popular definitions (Putnam, 2001) as well the more relevant definitions for the hypotheses related to this study (Lin, 1999).

Finally, the online news media variable, was based on the response to one survey question indicating the respondent's trust in traditional news media online (M = 4.14, SD = 2.46).

FINDINGS

***H1*: Advanced internet information use will correlate with higher trust measures for online news media.**

Hypothesis one was tested by a Pearson's correlation with the advanced information user variable correlated with the measure of online traditional news media trust. This was a partial correlation, using a control for the effects of demographic variables gender, education, income, race, and age. The results indicated a weak positive correlation, $r(956) = .113$, $p < .000$. A 95% confidence interval for ρ runs from .05 to .175. Thus, H1 is considered somewhat supported.

This was the weakest correlation among the hypothesized correlations and hints at the complexity of the relationship between internet information use and constructs of trust and credibility (as suggested by the earlier research). Additional research that could better capture the increasingly wide variety of online interactive behaviors, as well present as a more nuanced and contextual set of survey questions to investigate the concepts of "trust" and "credibility" would be useful to illuminate this ambiguous result.

***H2:* Content contributor users will show more trust in alternative (user-created) news sites than the population of advanced information users.**

Hypothesis two was tested by a Pearson's correlation, with the contributory user variable correlated with the alternative media trust variable. This was first tested as a partial correlation, controlling for the effects of the advanced information user variables $r(234) = .408$, $p <.000$, and then again, controlling for the same demographic variables as H1 above, $r(226) = .404$, $p<.000$. Both of these correlations were strong and positive, thus, H2 is supported.

To further examine the relationship between content creation and trust in alternative news sites, a series of regression models was run as follows in Table 2. Several demographic characteristics, the advanced information use measure, and the contributory use measure were the independent variables; the dependent variable was the alternative media trust measure.

Table 2 illustrates modest, but significant effects accounted for by the final model with the introduction of the contributory user variable. While the total effect is indeed small (with the selected variables accounting for approximately 15% of the variation) the large relative importance of the contributory use variable, a construct describes a regular *activity* rather than *characteristics,* is significant in pointing out the potential role for analysis of habitual human behaviors in online information contexts.

	Model 1 β	**Model 2 β**	**Model 3 β**
Age	-.081	-.079	-.025
Education	-.022	-.058	.022
Gender	.032	.025	-.007
Race	-.042	-.042	-.026
Income	-.076	-.082	.009
Adjusted R^2	**-.007**		
Advanced information user		.121	.42
Adjusted R^2		**.002**	
Contributory user			.418*
Adjusted R^2			**.152****

Table 2. Regression analyses of alternative media trust

*Significant at p<.000
**Significant change at p<.000

***RQ1:* Does a higher level of content contributions online correlate to a higher score on an index measure of (offline) social capital?**

Research question one was tested by a Pearson's correlation, with the contributory user variable correlated with the social capital index. This was tested as a partial correlation, controlling for the effects of the advanced information user variables $r(234) = .138$, $p <.034$, and then again, controlling for the same demographic variables as H1 above, $r(226) = .179$, $p<.007$. Both of these correlations were mild and positive.

In order to further explore this relationship, a series of regression models was run as follows in Table 3. Several demographic characteristics, the advanced information use measure, and the contributory use measure were the independent variables; the dependent variable was the social capital measure.

Table 3 illustrates the very small significant effect accounted for by any of the models, but nevertheless, the significance of the accounted-for variance change with the introduction of the contributory user variable suggests this as an area for future research.

If contributory use in an online environment is correlated in any way to overall social capital or community engagement measures, this may suggest a path for future credibility research that uses an even broader lens when examining the context of information behavior, rather than looking at an internet exchange as a somewhat isolated event.

	Model 1 β	Model 2 β	Model 3 β
Age	-.103	-.102	-.079
Education	.107	.079	.112
Gender	.121	.115	.102
Race	-.105	-.195	-.098
Income	.055	.051	.088
Adjusted R^2	**.028****		
Advanced information user		.092	.059
Adjusted R^2		**.032**	
Contributory user			.174*
Adjusted R^2			**.054*****

Table 3. Regression analyses of social capital measures

* Significant at p<.012
**Significant change at p<.043
***Significant change at p<.012

Technological changes (such as increasingly popular wireless internet devices) and techno-social changes (social networking as an information-gathering mechanism), as well as better critical understanding of the idea of "social capital" and credibility suggest these research results could help point the way for a more nuanced understanding of the context of a credible information exchange.

LIMITATIONS

The primary limitation of this study is that it did not capture the full range of participatory behaviors within online participatory environments. Similarly, its measures of "trust" were somewhat limited in describing a complex construction. A follow-up study might include measures of participation in wiki sites, discussion boards, distributed digital libraries, or other collaborative knowledge systems. Also, the inclusion of measures for additional types of sites that support purposive information-seeking behavior (such as government sites, question/answer boards, etc.) might indicate some additional nuances related to how credibility emerges with these kinds of purposive interactions.

CONCLUSION AND IMPLICATIONS FOR FUTURE RESEARCH

While it might seem a simple thing to "discover" that humans trust the information that they are familiar with….or are familiar with what they trust, the more pronounced effects of participatory behavior are significant and noteworthy. An interactive and social information world necessitates a deeper examination of the development of credibility and trust, and how they can underpin future collaborative knowledge building. Additional study of extant knowledge communities through more survey work, as well as interviews and some observational studies might be useful. Experimental study involving the creation of networked environments could also illuminate how a community can be built (or not built) around trusted information exchanges.

New information resources are more likely than ever to be distributed, collaborative, and online – perhaps created, curated, and used by people who have little to no offline interactions. A better understanding of how a "community" can engage in fruitful and credible information exchanges can only improve these types of resources to make them functional and supportive of an engaged democracy.

APPENDIX A: SURVEY QUESTIONS COMPRISING SOCIAL CAPTIAL MEASURE

All items were scored with a 10-point Likert scale indicating respondent's level of agreement. (Items 3 and 5 were reverse-coded.)

1. People in my community feel like family to me
2. I think people in my community share my values
3. In my community, people DO NOT influence each other's behavior
4. In my community, we talk to each other about community problems
5. I think people in my community feel isolated from each other

6. I think people in my community feel connected to each other
7. In my community, people help each other when there's a problem
8. People in my community watch out for each other
9. People in my community trust each other
10. Interacting with people in my community makes me want to try new things
11. Belonging to this community helps me network or meet new people

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