

DO WE HAVE INSTRUMENTS TO MEASURE SOCIAL CAPITAL AND TRUST GENERATED BY ONLINE CONNECTIONS? AN ANSWER FROM A SCOPING REVIEW

Authors:

Alexandra Hoeman, Morgan Ongradi, and Carly Malstein

Faculty Sponsor:

Carolina Borges

Department of Public Health

ABSTRACT

During the COVID-19 pandemic, social distancing guidelines have limited in-person social interactions. As a result of these social restrictions, online interactions and social media have become the predominant means of communication and social connection. This transformation in social interaction may have implications for social capital, the component of social structure which includes levels of interpersonal trust, reciprocity, and mutual support that serve as resources for individuals. The present scoping review aims to examine the existing instruments that measure social capital and/or trust generated by online interactions. 28 search combinations were used across three databases - PubMed, ERIC, PsychINFO, and Google Scholar. The searches yielded 4,923 published articles, with a final sample of 12 articles meeting the inclusion criteria. The primary findings of the scoping review indicate that measurements of online social capital are scarce; most papers which fit the inclusion criteria do not offer ample assessments of existing methods to measure online social capital. Overall, the findings of this literature scoping review indicate the urgent need for the development and evaluation of comprehensive online social capital assessment tools.

INTRODUCTION

Social determinants refer to conditions that affect life and health in the context of the environments where people live and work. Encompassing the five categories of economic stability, education, health and health care, neighborhood and built environment, and social and community context (Office of Disease Prevention and Health Promotion, n.d.), social determinants have been extensively discussed in the scientific literature (Hasanathan et al., 2009; Marmot 2015; Marmot 2017). Among the social determinants of health, social capital is considered a “cross-cutting” social determinant, affecting numerous dimensions of wellbeing (WHO, 2010). While issues related to social capital have been presented to the scientific health agenda for over two decades, there remains general disagreement regarding its definition and applications (Kawachi et al., 1997; Berkman & Kawachi, 2000). The Functional-Community and Sociological approaches are among the various frameworks used to differentiate social capital domains, and applications in diverse disciplines. The former refers to social capital as the features of social structure (i.e., levels of interpersonal trust and norms of reciprocity) that may facilitate collective action (Putnam, 1993). Through this approach, social capital is conceptualized as an extension of social relationships that serve as beneficial resources for individuals. According to this model, the erosion of social capital within a population may increase social inequities in ways that adversely affect people’s health. Indeed, the existing literature demonstrates that countries which underinvest in social networks report weak social cohesion and poorer health outcomes as a result (Pellegrini-Filho et al., 2008). In contrast, the Sociological approach refers to social capital as the resources that flow and emerge through social networks (Bourdieu, 1986; Coleman, 1988). In this context, social networks may determine people’s behaviors and attitudes by conditioning the exchange of resources that determine constraints on behavior and access to opportunities (e.g., employment, education, and healthcare). This can in turn impact individuals’ health outcomes (Berkman & Glass, 2000).

Acknowledging the existing variations between concepts, the present study attempts to reconcile these discrepancies by defining social capital through Rostila's (2010) interpretation. According to Rostila, social capital *“comprises social resources that evolve in accessible social networks and social structures characterized by mutual trust. These social resources, in turn, facilitate access to various instrumental and expressive returns, which might benefit both the individual and the collective.”* This definition may serve to resolve the contradictions between the individual and collective facets of social capital, providing a more comprehensive definition of the concept.

Currently, researchers disagree on the appropriate instruments to measure and quantify social capital. However, there is a consensus that measures should be adopted according to the approach or type of social capital under investigation. Empirical measurements of social capital often include various combinations of structured general questionnaires (Grootaert et al., 2004; Campos et al., 2015) as well as scales designed for specific populations (e.g., those of particular occupations or neighborhoods) (Kouvonen et al., 2006; Paiva et al., 2014; Nino et al., 2014; Mohnen et al., 2013). Additionally, state and county level indices are often included in current research methodologies, providing demographic context to analyses of social capital and its proxy variables (US Congress, 2018). However, most instruments published in the literature have been developed without distinguishing between in-person and online connections. As the COVID-19 pandemic has significantly impacted populations across the globe, government mandates have prevented physical contact, enforcing “social distancing” for consecutive months (Johns Hopkins, 2021). Since March of 2020, many around the world have relied on online interactions for social connection. As social and community context is a critical social determinant of health, this present scoping review aims to investigate the current existing instruments (questionnaires, surveys, scales) to measure social capital AND/OR cohesion AND/OR trust generated exclusively by online interactions among people.

DATA AND METHODS

This present scoping review aimed to answer the following research question: What are the current existing instruments (questionnaires, surveys, scales) to measure **social capital AND/OR social cohesion AND/OR trust** generated by online interactions among people? The method of scoping review was chosen to provide a preliminary assessment of the potential size and scope of available research literature in a transparent and replicable way (Grant and Booth, 2009). Our Scoping Methodology and review protocol followed the guidelines proposed by Munn et al. (2018).

Review Protocol

Search Strategy

Three databases were used in the present scoping review to conduct the searches for potential papers: 1) PubMed - National Library of Medicine/ National Center for Biotechnology Information; 2) PsycINFO - American Psychological Association, 3) ERIC - Education Resources Information Center, Institute of Education Sciences of the United States Department of Education, and 4) Google Scholar. The searches were conducted independently by three researchers during the months of November and December of 2020, and further reviewed in September 2021. The unit of our scoping review analysis was published, peer-reviewed articles that met the inclusion criteria. Our searches included 28 different combinations of the following keywords: Social, Capital, Cohesion, Trust, Online, Digital, questionnaire, survey, measure, instrument, method found as a “word text” (TABLE 1). The term “remote” was initially added to the search, however results conflated “remote” with “rural” and thus generated results that were not related to “digital” or “online.” We conducted an additional search on the Google Scholar database to retrieve articles from journals not indexed in the three major databases used for this review.

Inclusion and Exclusion criteria

The inclusion criteria were a) Year of publication – papers published from 1990 until Dec 1st of 2021 (1990 was chosen as the earliest year of publication because the internet became publicly available in 1991); b) All study designs including qualitative and quantitative (cross-sectional, ecological, case-control, cohort, randomized control trials, and community control trials; and c) studies that investigated the topic of

interest among adult populations. The exclusion criteria were a) studies that were reviews or summary studies; c) studies that investigated the topic of interest among children and/or adolescents; and d) articles with unavailable abstracts.

Table 1. Descriptors and their correspondent combinations used in the search builders.

<i>Descriptor</i>	<i>Boolean</i>	<i>Descriptor</i>	<i>Boolean</i>	<i>Descriptor</i>	<i>Boolean</i>	<i>Descriptor</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>questionnaire</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>survey*</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>measure*</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>instrument*</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>method*</i>
<i>Social</i>	<i>AND</i>	<i>Cohesion</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>questionnaire</i>
<i>Social</i>	<i>AND</i>	<i>Cohesion</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>survey*</i>
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<i>Social</i>	<i>AND</i>	<i>Cohesion</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>instrument*</i>
<i>Social</i>	<i>AND</i>	<i>Cohesion</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>method*</i>
<i>Social</i>	<i>AND</i>	<i>Trust</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>questionnaire</i>
<i>Social</i>	<i>AND</i>	<i>Trust</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>survey*</i>
<i>Social</i>	<i>AND</i>	<i>Trust</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>measure*</i>
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<i>Social</i>	<i>AND</i>	<i>Trust</i>	<i>AND</i>	<i>online</i>	<i>AND</i>	<i>method*</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>digital</i>	<i>AND</i>	<i>questionnaire</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>digital</i>	<i>AND</i>	<i>survey*</i>
<i>Social</i>	<i>AND</i>	<i>Capital</i>	<i>AND</i>	<i>digital</i>	<i>AND</i>	<i>measure*</i>
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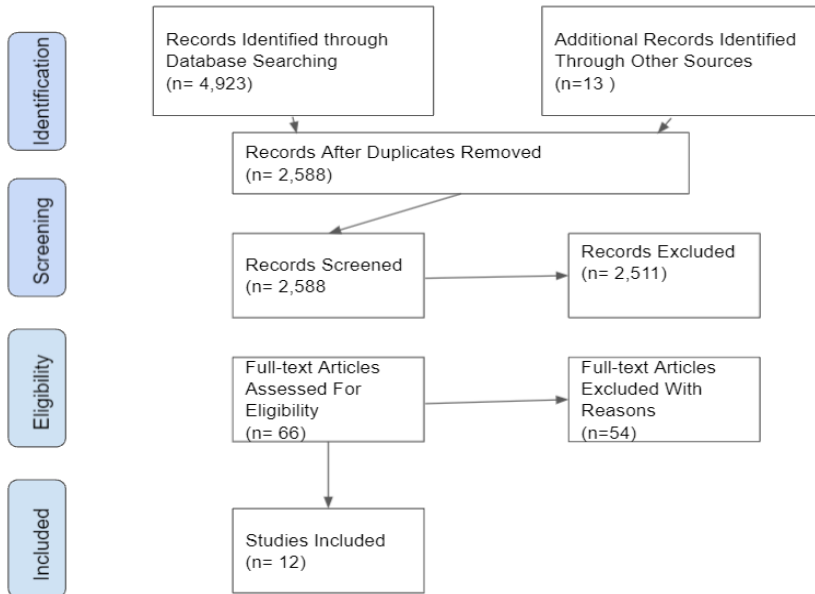
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RESULTS AND FINDINGS

We analyzed 12 full papers that met the inclusion criteria and cleared all the indicated screening phases of the review (FIGURE 1). In total, analyzed studies sampled N=31,993 individuals across five continents. 44.8% of the studies were conducted in North America, 24.1% in Europe, 13.7% in Australia, 24.1% in Asia, and 3.4% in Africa. All 12 studies were published between the years 2007 and 2021. The characteristics of the studies included in the present scoping review are presented by author; year of publication; source origin/country of origin; aims/purpose; study population and sample size; methodology; concept; how outcomes are measured; and key findings (TABLE 2).

Figure 1. Records included in identification, screening, eligibility, and inclusion stages of scoping review



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Table 2. Characteristics of studies included in this scoping review (N=12)

Study	Authors	Year of Publication	Source origin/ country of origin	Aims/ purpose	Study population and sample size (if applicable)	Methodology (type of study design)	Description of the Questionnaire/Scale	Key findings
Positive and Negative Experiences on Social Media and Perceived Social Isolation.	Brian A Primack, Sabrina A Karim, Ariel Shensa, Nicholas Bowman, Jennifer Knight, Jaime E Sidani	2019	United States	To examine the association between positive and negative experiences on social media (SM) and perceived social isolation (PSI).	1178 students aged 18 to 30	Cross-sectional survey.	Social isolation was measured using the established Patient-Reported Outcomes Measures Information System scale. Online survey was administered to 1178 students. Survey asked students to estimate what percentage of their social media usage what positive or negative	Having positive experiences on social media is not associated with lower social isolation, whereas having negative experiences on social media is associated with higher social isolation.
Benefiting from social capital in online support groups: an empirical study of cancer patients.	Christopher E Beaudoin, Chen-Chao Tao	2007	United States	To measure the effect of the online cancer patient environment on patient health outcomes	Cancer patients	Online survey	An online survey was conducted with 372 current cancer respondents. Questions related to interpersonal trust had four items with a Likert-style four-point scale from “strongly disagree” to “strongly agree”	The findings suggest that the Internet can be a positive cyber venue for cancer patients as they confront illness, undergo treatment, and seek out support.

<p>The Impact of COVID-19 on Mental Health: The Role of Locus on Control and Internet Use.</p>	<p>Rannveig Sigurvinsdottir, Ingibjorg E Thorisdottir, Haukur Freyr Gylfason</p>	<p>2020</p>	<p>Iceland</p>	<p>To examine whether exposure to COVID-19 would relate to greater symptoms of depression, anxiety, and stress, and to examine the role of internet use and locus of control</p>	<p>1723 participants of 18+ years residing in the United States, France, Germany, Italy, Spain, or the United Kingdom.</p>	<p>Online survey through the website Mturk</p>	<p>Online survey with participants recruited from Amazon Mechanical Turk (MTurk) Two attention-checking items were used in the survey; participants who failed to respond correctly to them were removed. Internet Social Capital was assessed using the Internet Social Capital Scale (ISCS) Participants rated 20 statements on a five-item scale from 1 “strongly agree” to 5 “strongly disagree”</p>	<p>Experience using the Internet relates to fewer psychological symptoms, but information seeking is associated with more symptoms. Internet social capital relates to fewer symptoms of depression. Having an external locus of control relates to greater symptoms</p>
<p>COVID-19 is rapidly changing: Examining public perceptions and behaviors in response to this evolving pandemic.</p>	<p>Holly Seale, Anita E Heywood, Julie Leask, Meru Sheel, Susan Thomas, David N Durrheim, Katarzyna Bolsewicz, Rajneesh</p>	<p>2020</p>	<p>Australia</p>	<p>To examine the attitudes and beliefs of Australian adults towards the COVID-19 pandemic, and willingness and capacity to engage with these mitigation measures. To explore the psychosocial and</p>	<p>1420 Australian adults (18 years and older)</p>	<p>Cross-sectional online survey</p>	<p>For the online survey, ten items were used to assess perceptions about the COVID-19 pandemic, including perceived risk level and impact on health (if infected). 8/10 items were phrased as statements, with Likert response options (5= strongly agree; 1 for strongly disagree). Two items measuring</p>	<p>Adopting avoidance behaviors was associated with trust in government/authorities, higher perceived rating of effectiveness of behaviors, higher levels of perceived ability to adopt social distancing strategies, higher trust in government, and higher level of concern if self-isolated</p>

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	Kaur			demographic factors that are associated with adoption of recommended hygiene-related and avoidance-related behaviors.			participants' level of worry about current Covid-19 were used on the same Likert scale. Respondents were also asked to rate the perceived level of effectiveness of 13 items in reducing the risk from COVID-19 on the same five-point Likert scale.	
Designing and validating the friendship quality on social network sites questionnaire.	Karen Verswijvel, Wannes Heirman, Kris Hardies, Michel Walrave	2018	Belgium	To determine the quality of friendships on social network sites through the creation and validation of the Friendship Quality on Social Network Sites questionnaire (FQSNS-questionnaire)	1,695 friendships from 1,087 adolescents	In person survey completed in schools	The questionnaire aimed to assess friendship quality through the following five dimensions: satisfaction, companionship, help, intimacy, and self-validation. "The questionnaire consists of 40 items whereby children from elementary school have to indicate to what extent each of these dimensions of friendship quality applied to a particular friend: (1) validation and caring: the extent to which the friendship is characterized by caring, interest, and	The FQSNS-questionnaire was found to be an effective and reliable tool for future research on the quality of friendships formed through social network sites.

							<p>support; (2) conflict and betrayal: the level to which the friendship consists of argument, disagreement, mistrust, and annoyance; (3) companionship and recreation: the degree to which friends spend enjoyable time together, in and out of school; (4) help and guidance: the level of friends' effort to assist each other with challenging and routine tasks; (5) intimate exchange: the degree to which the friendship is characterized by disclosure of feelings and personal information; and (6) conflict resolution: the extent to which disagreements are resolved on an efficient and fairly matter"</p>	
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<p>Is social media use for networking positive or negative? Offline social capital and Internet addiction as mediators for the relationship between social media use and mental health.</p>	<p>Phillp Glaser, James Liu, Moh Abdul Hakim, Roosevelt Vilar, Robert Zhang</p>	<p>2018</p>	<p>New Zealand</p>	<p>To test the augmentation and displacement hypothesis through a survey regarding people's social media use and mental health.</p>	<p>1157 New Zealanders</p>	<p>Online survey completed by Nielsen (media polling company based in the US)</p>	<p>The survey asked participants to respond to seven-point Likert-type scales (1=never....7=all the time) for the following measures: Social media use for networking, anxiety, depression, offline social capital, internet addiction, and social media use for news.</p>	<p>It was concluded that when social networking is the only form of social capital a person has, that person is more likely to experience symptoms of anxiety and depression. Additionally, Likert scales may be an effective method of evaluating wellbeing in relation to social capital.</p>
<p>Social network sites, individual social capital and happiness.</p>	<p>Efstratia Arampatzi, Martijn Burger, Natallia Novik</p>	<p>2016</p>	<p>Netherlands</p>	<p>To examine the effect of social networking site (SNS) use on the happiness of young adults.</p>	<p>1339 Dutch young adults (15-44 years of age)</p>	<p>Online survey panel called the Dutch Longitudinal Internet Studies for the Social Sciences" completed in 2012 and 2013</p>	<p>Each category was measured based upon different survey questions: Happiness was measured on an 11-point scale, SNS use was measured by the average number of hours spent on SNS per week, social capital was measured by the quantity and quality of social contacts with family</p>	<p>The results provide evidence of a negative association between the number of hours spent on SNSs and happiness for individuals who have decreased social capital. This further suggests that the effect of SNS on an individual's well-being is strongly dependent on the person's social capital.</p>

							and friends.	
The role of attachment style in building social capital from a social networking site: The interplay of anxiety and avoidance.	Lee, Doo Young	2013	South Korea	To investigate the role of attachment style in creating online social networks.	368 Facebook users	Online survey	<p>Quota and non-random convenience sampling (target group= gender balanced, 19-25-year-old South Korean college students, 1 year of experience with facebook use)</p> <p>Bridging and bonding social capital was measured based upon previous research (five-item, seven-point Likert scale)</p> <p>Attachment style was measured using a method developed from the Adult Attachment Questionnaire</p>	<p>Avoidant attachment was significant and negatively predictive of both bonding social and bridging social capital. Additionally, both bonding social capital and bridging social capital reported by respondents appeared to be greatest under conditions of low anxiety attachment coupled with low avoidant attachment. Levels of Facebook usage were significant and independently predictive of bridging social capital.</p>

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<p>Social ties and generalized trust, online and in person: Contact or conflict – The mediating role of bonding social capital in America.</p>	<p>Bouchillon, Brandon C.</p>	<p>2014</p>	<p>Canada</p>	<p>To understand the role and impact of online and in-person social networks and trust in America.</p>	<p>(n = 888)</p>	<p>Online Survey</p>	<p>Convenience sample was distributed in class and via email to undergraduate students</p> <p>66-item self-administered survey through Qualtrics</p> <p>Independent measures: Party ID and strength of partisanship (2 focus questions from previous research study), political participation (6 items drawn from previous study), intensity of Facebook usage (2 self-reported assessments from previous study), bonding social capital (five-point Likert scale), and bridging social capital (five-point Likert scale)</p> <p>Dependent measures: civic engagement (8-point Likert scale drawn from previous studies), and generalized trust (Faith in People scale).</p>	<p>Facebook use was found to have an indirect but positive influence on trust through levels of bonding social capital. Civic engagement was also positively related to trust through the same measure of bonding social capital, allowing like-minded members of civic groups to connect, which contributed to trust.</p>
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<p>Performance consequences of social capital in online communities: The roles of exchange and combination, and absorptive capacity.</p>	<p>Sabherwal, Rajiv and Kumi, Richard</p>	<p>2018</p>	<p>Little Rock, Arizona, United States</p>	<p>To investigate associations between social capital and online exchange behaviors.</p>	<p>253 participants Male Female Age Group: Adulthood (18 yrs & older) Young Adulthood (18-29 yrs) Thirties (30-39 yrs) Middle Age (40-64 yrs)</p>	<p>Empirical Study; Mathematical Model; Qualitative Study; Quantitative Study</p>	<p>Voluntary online survey was used for data collection</p> <p>All constructs were measured along a five-point Likert scale (designed from previous research papers and studies)</p> <p>The variables measured were relational capital, structural capital, cognitive capital, exchange and combination, absorptive capacity, individual performance, and community performance. The variables were assessed on a scale designed from previous research studies.</p>	<p>The results indicate that cognitive and structural capital facilitate exchange and combination behaviors in online communities, but relational capital does not. Exchange and combination behaviors facilitate the performance of individuals as well as the online community, and a higher level of absorptive capacity enhances these effects.</p>
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<p>The development of a bridging social capital questionnaire for use in population health research</p>	<p>E. Villalonga-Olives, I. Adams, I. Kawachi</p>	<p>2016</p>	<p>United States</p>	<p>To develop and assess the validity of a questionnaire to measure bridging social capital.</p>	<p>Focus group included 17 participants, while psychometric analysis included 138 participants. Participants were Latino immigrants.</p>	<p>Questionnaire content validity assessed through qualitative focus group feedback and quantitative psychometric analysis.</p>	<p>The structure of the questionnaire consisted of the following assessments: socialization in the workplace (five items); membership in community activities (16 items); participation in community activities (five items); contact with similar/different people (7 items); assistance (17 items); trust of institutions, corporations, and other people (14 items); and trust of intimate people (3 items). To measure the validity of the questionnaire, focus groups were used to analyze themes of the questionnaire items. Changes were made to the questionnaire based on difficulty, redundancy, length, and semantics. The questionnaire's psychometric properties were tested for internal consistency and construct validity for</p>	<p>It was determined that the questionnaire had good content validity. The questionnaire may be suitable for further refinement and adaptation to other immigrant groups in different countries.</p>
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							each subscale.	
On and off the 'Net: Scales for Social Capital in an Online Era	Dmitri Williams	2006	United States	To develop and assess a scale measuring online and offline bridging and bonding social capital.	884 adults	Psychometric analysis of online survey scale	The assessment consisted of two parallel scales, for online and offline use. Each has a subscale for bridging and bonding measures, (which resulted in four subscales). Each subscale consisted of ten question items which used a five-point Likert scale response ranging from 10 to 50.	Question items were found to be valid and psychometrically sound

DISCUSSION

This scoping review aimed to answer the following research question: What are the current existing instruments (questionnaires, surveys, measurement instruments) to measure social capital AND/OR cohesion AND/OR trust generated by online connections/interactions among people? After applying the inclusion criteria to the search results, the remaining studies (N=12) were analyzed and qualitatively grouped into three thematic categories: Measuring Online Social Capital Using Online Questionnaires, Measuring Social Capital Using Online Likert-scale Surveys, and Studies Developing and Assessing Scales to Measure Social Capital. 100% of the analyzed studies were published between the years of 2006 and 2020; 41.7% were conducted in the USA, 8.3% in Australia, 8.3% in Belgium, 8.3% in Canada, 8.3% in Iceland, 8.3% in the Netherlands, 8.3% in New Zealand, and 8.3% in South Korea.

Because studies validating existing instruments to measure online social capital are scarce, the research methods of studies quantifying online social capital were analyzed to examine the extant scales and surveys currently used in this area of research. These studies are examined in the first two categories of the discussion. It was found that Likert scales delivered using online surveys were the most prominent method for measuring online social capital, although no standardized scales or question items appeared in these studies. The final section of the discussion assesses those studies which developed and evaluated instruments to measure social capital. While these studies offer validated scales to quantify social capital, not every scale is designed to measure *online* social capital. Additionally, some questionnaires are intended to be conducted in-person rather than in an online format, while others are intended only for specific groups and cannot be used for the general population. A 2006 study analyzing a survey to measure both online and offline social capital was found to be the most relevant study to the research question (Williams 2006).

MEASURING ONLINE SOCIAL CAPITAL USING ONLINE QUESTIONNAIRES

In examining the current tools available to measure online social capital, the instruments of studies evaluating online social capital and proxy variables were evaluated. The study "Positive and Negative Experiences on Social Media and Perceived Social Isolation," which aimed to assess the relationship between social media experiences and social capital, quantified these measurements using an online survey (Primack et al., 2019). The survey prompted the participants to describe their experience with social media, which was then categorized into "positive" or "negative" experiences. Additionally, the Patient-Reported Outcomes Measures Information System scale, which assesses a variety of self-reported patient health outcomes, was specifically utilized to measure social isolation. Finally, regression models were used to determine the relationship between positive and negative experience on social media and social isolation. Similarly, the study "Social Network Sites, Individual Social Capital, and Happiness" analyzes the relationship between social network sites and social capital by implementing the Dutch Longitudinal Internet Studies for the Social Sciences (LISS) panel for the years 2012–2013 (Arampatzi et al., 2018). The LISS online survey prompted individuals to report on several aspects of their life, including happiness, internet use, and individual social capital. The respondent's online activity was measured by reporting the average number of hours spent per week on social media. Next, individual social capital was measured by the quantity and quality of social contacts with friends and family members. The quantity (frequency) of contacts was measured using the following two questions: "How often do you spend an evening with family?; How often do you spend an evening with friends?" For each of those question items, possible responses included "almost every day"; "once or twice per week"; "a few times per month"; "about once per month"; "a number of times per year"; "about once per year"; "never"; "don't know"; or "not applicable". Other variables included subjective measures of satisfaction with contacts. Satisfaction with contacts was measured with the question "How satisfied are you with your social contacts?" with answers ranging from 1-10, with 1 indicating not satisfied and 10 indicating very satisfied. Although these studies did not aim to assess or validate the methods or instruments utilized, they indicate that online social capital is often quantified through responses to subjective questions implemented through online questionnaires. They also indicate that standardized scales used to measure general health outcomes (such as the Patient-Reported Outcomes Measures Information System or Longitudinal Internet Studies for the Social Sciences) may be adopted to measure social capital.

MEASURING ONLINE SOCIAL CAPITAL USING ONLINE LIKERT-SCALE SURVEYS

Throughout the review of the existing literature, it was found that instruments used to measure social capital were consistently formatted as online surveys featuring items on Likert-type scales. The study “Benefiting from Social Capital in Online Support Groups: An Empirical Study of Cancer Patients” aimed to measure the effects of the online cancer patient environment/online social capital on patient health outcomes (Beaudoin & Tao, 2007). This analysis measured this form of social capital through an internet survey. Questions related to interpersonal trust, interpersonal support, and coping were evaluated through four items with a Likert-style four-point scale from “strongly disagree” to “strongly agree.” Question items measuring stress and depression variables prompted participants to respond on a five-point scale from “never” to “very often.” Likewise, the study “The Impact of COVID-19 on Mental Health: The Role of Locus on Control and Internet Use” examined the role of online social capital on symptoms of depression, anxiety, and stress, during COVID-19 (Sigurvinsdottir et al., 2020). Online social capital was measured using the ISCS (Internet Social Capital Scale). Participants rated 20 statements from this scale on a five-item scale from “strongly disagree” to “strongly agree,” using a Likert-type format as previously described. Similarly, an Australian study which aimed to measure levels of social capital and trust among Australian adults during the pandemic implemented a similar online survey (Seale et al., 2020). This questionnaire included ten items which were phrased as statements with Likert-formatted response options (1 indicating strongly disagree and five indicating strongly agree). Additionally, respondents were asked to rate the perceived level of effectiveness of thirteen items in reducing the risk from COVID-19 on the same five-point Likert scale. Another comparable study design was utilized in an analysis of online social capital and mental health (Glaser et al., 2018). This study utilized an online survey that prompted participants to respond to question items assessing individuals’ social media use for the purpose of networking and news. Items also included questions related to anxiety, depression, offline social interactions, and internet addiction. Response options were formatted on a seven-point Likert response (1 indicating never, 7 indicating all the time). Utilizing a similar scale, a 2013 article investigated the role of attachment style in creating online social networks (Lee, 2013). Analogous to the previous studies, bridging and bonding social capital were measured using a five-item online survey, with a seven-point Likert response scale. Additionally, Bouchillon (2014) examined the relationship between online social networks and levels of trust, discriminating between bridging and bonding social capital. Like the previous articles, the study design featured an online survey with 66 items on a five-point Likert response scale. Finally, an article investigating associations between social capital and online exchange behaviors likewise measured variables relating to social capital through an online survey with a five-point Likert scale response format (Sabherwal, 2018). Overall, these studies indicate that although there does not appear to exist a standard survey scale to measure online social capital and related variables, these can be effectively quantified using online surveys with Likert-style responses.

DEVELOPING AND ASSESSING SCALES TO MEASURE SOCIAL CAPITAL

After implementing the search strategy, three articles detailed the development and validation of scales to measure social capital. These scales included both online and in-person assessments, all of which were found to be reliable and valid by their respective analyses. However, the search results reflected a lack of standardized online scales to measure both bridging and bonding social capital in a virtual environment. For example, a 2018 study detailed the development and validation of the Friendship Quality on Social Network Sites Questionnaire (FQSNS), an in-person survey intended to measure the quality of online friendships of school-aged children (Verswijvel et al., 2018). Developed from previous scales used to quantify children and adolescents’ perceptions of the quality of their friendships, the questionnaire assessed five dimensions of friendship, identified as “satisfaction, companionship, help, intimacy, and self-validation.” Participants indicated the extent to which each of these dimensions applied to a specific online friend by responding to 16 survey items. Respondents used a five-point Likert scale rating (1 indicating “totally disagree” and five indicating “totally agree”). Although the validation and reliability tests found the FQSNS to be an accurate instrument to measure the dimensions of online friendships and

the perceived quality of those dimensions, it did not specifically address aspects of bridging and bonding relationships. Additionally, the survey was not designed for online administration, nor was the questionnaire adjusted for an adult population, further demonstrating lack of existing scales to measure online bridging and bonding social capital. Aiming to address this gap, the article "the development of a Bridging Social Capital Questionnaire for use in Population Health Research" outlined the development and validation of a scale to measure the bridging social capital among the Latino immigrant population (Villalonga-Olives et al., 2016). The questionnaire assesses the dimensions of socialization in the workplace; membership in community activities; participation in community activities; contact with similar/different people; assistance; trust of institutions, corporations, and other people; and trust of intimate people. In total, the survey consisted of 67 items with higher scores indicating greater social capital. The questionnaire's content validity was assessed through focus group feedback and psychometric analysis, with the study finding that the scale was valid and reliable. While this instrument was implemented to assess the social capital of immigrant communities, with the first, third and fourth dimensions specifically addressing bridging social capital, it was not specifically adopted for the assessment of online relationships. This once more reflects the lack of instruments to measure online bridging and bonding social capital, especially in the general population. Finally, the 2006 study "On and off the 'Net: Scales for Social Capital in an Online Era" offers the Internet Social Capital Scale, which measures bridging and bonding social capital, both online and offline (Williams, 2006). The assessment consists of two analogous scales for online and offline social capital, respectively. Additionally, each scale features subscale to measure bridging and bonding dimensions, respectively. These subscales include ten items using a five-point Likert scale response. Evaluation of the scale found the question items to be valid and psychometrically sound. This questionnaire offered the measurements most relevant to the assessment of online bridging and bonding social capital.

CONCLUSIONS

After conducting the scoping review according to the outlined strategy, most of the articles which fit the inclusion criteria did not offer ample evaluations of the existing methods to measure online social capital. Rather, only three studies analyzed and validated scales to assess online social capital. In reviewing the research methods of the studies which quantifiably measured social capital, it was found that Likert scales delivered through online surveys were the most prominent method. However, no standardized scales or question items appeared in the articles, with many studies adopting general patient outcome scales for the purpose of measuring social capital. In reviewing the studies which detail the development and validation of scales to measure social capital, it was found that questionnaires were also the most common instrument. However, not every scale featured in the included studies specifically measured online social capital, while others were designed for specific populations. Additionally, some tools were exclusively designed for in-person implementation, which may present a challenge for researchers studying online social capital during periods of mandated social distancing. Therefore, there is an apparent lack of standardized measurements to quantify online social capital among the general adult population. Finally, a 2006 study analyzing surveys to measure both online and offline social capital, respectively, was found to be the most relevant study to the research question (Williams, 2006). The article's online social capital survey may be adopted in future research regarding this topic, as the scale is applicable to the general population. As a consequence of the COVID-19 pandemic, individuals are increasingly relying on the internet for social connection, which can have important implications for population health. Thus, the findings of this literature scoping review indicate the urgent need for the development and evaluation of comprehensive online social capital assessment tools.

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