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Social Capital and Pro-Social Behavior Online and Offline

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Abstract: Pro-social behavior, one of the defining characteristics of humans as social beings, plays a vital role in maintaining social bonds and in making social transactions possible. The questions which drive this study are whether there is any association between pro-social behavior or social capital online and offline, and whether we can see different patterns of effects of pro-social behavior on social capital online and offline. Using data obtained through an online survey of 1912 Internet users in Bosnia and Herzegovina, Croatia and Serbia, this study finds that pro-social behavior online and offline are closely related, as are social capital online and offline. In terms of the effects of pro-social behavior, however, we find that whereas online behavior has a stronger impact on online social capital than on offline social capital, the reverse does not hold: offline pro-social behavior has roughly the same impact on both types of social capital. Finally, online pro-social behavior is associated with a greater level of bridging offline social capital, suggesting positive spill-over effects from online acts of kindness. Our results inform future studies that wish to focus on pro-social behavior regarding the dual spheres in which it is present, as well as about the limited cross-over effects that exist between the two.

Keywords: Pro-social behavior, offline, online, social capital, community

Introduction

Interaction and social networking have become, in recent years, terms which are impossible to separate from what we conceive the Internet to be, and how we make use of it. Existing analyses have covered significant ground in describing how individuals make use of online social networking services, what the psychological effects of such use are, and how the online and offline networks in which users are embedded relate to each other. Investigating the relationship between online interactions and social capital gains additional salience in the context of ethnically diverse societies with a history of inter-ethnic conflict, such as those in the Western Balkans. In environments where prolonged internecine strife has disintegrated diverse social networks (particularly those that included individuals from different social, linguistic and ethnic backgrounds) the question of how to begin rebuilding these networks becomes paramount. While starting from the empirical finding that social capital in Western Balkan countries is predominantly of the bonding variety (Nixon et al., 2009; Powell, 2009), our analysis investigates whether online interactions might compensate for some parts of this reality, by stimulating the appearance of bridging offline social capital. Although offline forms of social capital such as associational membership remain weak, it could be the case that ties formed through online interactions may help to compensate.

The internal conflict in Western Balkan countries at the beginning of the 90s managed to tear apart much of what had frequently been multi-ethnic communities and partially reconfigure social networks along ethnic lines. The

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changes brought about by the conflict at the level of social cohesion and patterns of association in communities have been consistently documented in studies and reports focusing on the region (Håkansson & Hargreaves, 2004; Håkansson & Sjöholm, 2007; Nixon et al., 2009; Pickering, 2006; Poggi, Bougarel, Davis, & Lytle, 2002). While taking into account the usual dangers that stem from comparing estimates obtained from different surveys, the data seems to point to a consistent drop in interpersonal trust in the post-war years. Whereas in the 1998 World Values Surveys–already over two years after the end of the war–26.9 percent of respondents in Bosnia and Herzegovina reported that most people can be trusted, this had fallen to 14.5 percent in 2003 (Håkansson & Hargreaves, 2004), and reached 10 percent by 2009 (Nixon et al., 2009).

In response to this trend, most recent analyses (e.g., Nixon et al., 2009) emphasize the need for developing bridging social capital at the level of Bosnian society, such as norms of reciprocity that transcend ethnic boundaries[1], raising awareness about volunteering, and promoting the development of civil society associations with cross-cutting membership. In a social context where less than 1 in 5 individuals report being a member (either active or inactive) of any kind of association (compared to levels of 80–90 percent in some Scandinavian countries), such steps appear necessary to revitalize a civic spirit that would go beyond one's ethnic group. At the same time, it seems doubtful that in a climate of extremely low levels of bridging social capital such associations could be formed voluntarily. It appears more likely that numerous smaller exclusive associations would be formed, catering to particular communities or neighborhoods, and reinforcing already high levels of bonding social capital.

We focus in this study on the extent to which pro-social behavior and social capital, in both the online and offline domain, are related to each other, in the context of Bosnia and Herzegovina, Croatia and Serbia. The four questions that drive our inquiry are, firstly, whether there is any correlation between online and offline forms of social capital; secondly, whether individuals who report higher levels of pro-social behavior offline tend to report similar levels online as well; thirdly, whether online interactions might have effects of different magnitude on social capital compared to offline interactions. Finally, we are interested in whether we can observe a distinction between the online and offline environment in terms of the type of social capital they are more conducive to. Our expectation is that although both online and offline interactions are conducive to both forms of social capital (bridging and bonding capital), online interactions are particularly conducive to the bridging form.

We use a convenience sample of users of some of the most popular web sites in Bosnia and Herzegovina, Croatia and Serbia to explore whether there is a difference between the types of social capital, bridging or bonding (Putnam, 2000; Yamagishi & Yamagishi, 1994), that Internet users manifest online and offline. Establishing a link between pro-social behavior online and higher levels of bridging social capital might provide a way out of the democratic "Catch-22": low levels of bridging social capital prevent the appearance of civil society organizations with cross-cutting membership, which are supposed to help in developing bridging social capital. The paper proceeds as follows: the next section will present the concepts on which the discussion is based (social capital, pro-social behavior) as well as the findings in the literature regarding the effects of the Internet on these. Subsequently, the sample on which the research is based will be presented, along with the main variables analyzed. Finally, the results will be presented and discussed.

Literature Review

Social capital, understood here as those "features of social organizations, such as networks, norms, and trust, that facilitate action and cooperation for mutual benefit" (Portes, 1998, p. 18) has been, for the past 20 years, a primary area of interest for researchers who aimed at a better understanding of the processes that generate good governance at the local or national level. Starting with Robert Putnam's groundbreaking investigation of variations in good local governance in Italy (Putnam, 1993), a host of other studies have established a fairly strong bi-directional link between social capital (defined either as interpersonal or institutional trust) and support for, or quality of, democratic institutions (Freitag & Bühlmann, 2009; Hetherington, 1998; Jamal & Nooruddin, 2010; Newton, 2001; Rothstein & Stolle, 2008; Wong, Wan, & Hsiao, 2011). Societies in which there is a high degree of generalized reciprocity among members are shown to have more efficient political institutions, as costs of transaction are reduced considerably. At the same time, generalized trust has been associated with political trust, which makes participation more likely as a result of the belief that political institutions are responsive to the demands of the citizens (Levi & Stoker, 2000).

Rather early in the study of this phenomenon a distinction was established between *bridging* and *bonding* social capital (Putnam, 2000, pp. 22–24). Bridging social capital is described as inclusive, fostered in networks where membership is not restricted to a particular group defined by strict racial, class, linguistic or ethnic criteria. Regular

[1]"There appears to be a common pattern of bonding social capital and a relative lack of bridging or linking social capital that is more or less pervasive throughout all sections of BiH [Bosnia and Herzegovina] society." (Nixon et al., 2009, p. 37)

interactions inside these networks would gradually build norms of generalized trust and reciprocity at the individual level. These relationships, testament to the existence of heterophily (see McPherson, Smith-Lovin, & Cook, 2001), are able to offer the individual access to new information (Granovetter, 1973), but are not very adept in providing emotional support in times of need (Williams, 2006). Bonding social capital, on the other hand, is exclusive, fostered in tight-knit networks of family members and close friends. Although the degree of information redundancy in these networks is likely high (as most members occupy the same social space), they provide what Robert Putnam calls the "sociological superglue" which gets members through tough emotional stages in their lives.

Reciprocity and pro-social behavior

Part and parcel of most definitions of social capital is the development of norms of cooperation and, in particular, reciprocity (Blanchard & Horan, 1998, p. 294). Such norms, when generalized at the community level, reduce the need for enforcement of community rules and contracts, as there is a reasonable expectation that most individuals will follow the rules, which in turn leads to economic efficiency (Fukuyama, 1996). Behavioral 'markers' of this attitude at the community level are acts of pro-social behavior, which have been defined as "voluntary actions that are intended to help or benefit another individual or group of individuals" (Eisenberg & Mussen, 1989, p. 3). The definition allows for a variety of behaviors to be considered pro-social in nature, grouped under two headings (Sproull, Conley, & Moon, 2005, p. 147): altruistic pro-social behavior, from which the individual derives no benefit other than the satisfaction of having engaged in the act, and egoistic pro-social behavior, through which the individual increases their own welfare as well.

With the advent of a new sphere of social interactions (i.e., the Internet), pro-social behavior research has begun to target two main areas: online exchanges, such as the numerous forums and email lists in which people answer queries (sometimes with considerable cost of time); and projects such as Wikipedia and open source software (e.g., the Linux operating system, the Mozilla Firefox web browser, and the R statistical environment). The drive has been to try to understand what motivates contributors. On the one hand, social learning theory (Bandura, 1977) would attribute such a behavior to a natural process of observing the rewards that accrue to those displaying positive behavior in the group, and learning from it. Social identity theory (Tajfel & Turner, 1986), on the other, would argue that desired identification with a (online) group will lead to a gradual internalization of the group's core principles and norms, including offering help (for a summary, see Sproull et al., 2005). Other explanations are possible as well: Is it mainly economic considerations and self-interest, are the participants "motivated by community interest and moral obligation" (Wasko & Faraj, 2005, p. 161), or is it a mix of the two? In a recent study Matzat (2009) showed, in the case of professional communities that function online, how considerations of reputation can also drive participation in the community and pro-social behavior.

If community interest is the main reason for which such behavior thrives in these online environments, one would have reason to expect these exchanges to promote the adoption of a similar behavior in face-to-face interactions. So far, however, the literature has been silent on the potential connection between pro-social behavior online and offline. There are arguments according to which there is no significant difference between pro-social behaviors in the two environments. In both situations the person asking for assistance and the one offering it most likely do not know each other, there is no control over when requests for assistance are made, and the assistance is offered without any specific expectation of reciprocity (see Amichai-Hamburger, 2008, p. 546).

At the same time, considerable differences can be pointed out to warrant a focus on the links between pro-social behaviors in the two environments. Online interactions, particularly if occurring under conditions of quasi-anonymity, produce little direct recognition for the person engaging in them. Under these circumstances, individuals who display pro-social behavior offline might find the online environment too impersonal, and therefore make few attempts to contribute to the interactions taking place there. As Sproull et al. (2005, p. 143) highlighted, given the lack of information (in certain online communities) about the physical characteristics of the person asking for help, such assistance could either be more, or less, frequent, than in the offline world. At the same time, because of the lack of threat to one's self-image in the public sphere which online anonymity affords, help requests might be more frequent online, compared to offline (Karabenick & Knapp, 1988). Unlike offline situations, where a single act of kindness might go unobserved, online pro-social behavior is indexed and archived if it occurs on listservs or chat groups; this might actually be conducive to a higher level of reciprocity in these online communities (Wellman & Gulia, 1999).

Social capital in online interactions

One potential avenue of investigation concerns the possibility that social capital can be generated by online interactions as well. A number of studies (Kittilson & Dalton, 2011; Quan-Haase, Wellman, Witte, & Hampton, 2002) hinted at the possibility that, far from disappearing, social capital is simply relocating in virtual networks. If pro-social behavior online results in social capital of the bridging variety, then there are reasons to hope that

activism in online communities holds some hope for the fledgling democratic societies found in post-conflict contexts.

Predictable utopian/dystopian lines of argumentation marked the initial studies into the phenomenon: the Internet was said either to be a threat to community, or a new mechanism of creating stronger and more active communities. In the first instance, critics pointed to the time displacement effect that the Internet had: more use meant less time devoted to one's family, friends, and community (Nie, 2001; Nie & Erbring, 2000; Nie, Hillygus, & Erbring, 2002). At the same time, a "relationship displacement" effect was hypothesized: the Internet could very well increase the number of weak ties, which can be easily formed in cyberspace, but it would reduce the number of stronger, offline ties, which are supported by face-to-face interaction (Kraut et al., 1998). Kendall (2011) even discusses whether 'community' understood in the offline sense, a term that "carries significant emotional baggage" (p. 309), can be applied to online interactions, or whether we are in fact observing a trend toward "network individualism" (Wellman, 2002).

Other scholars, in contrast, have argued that the Internet excels at bringing together people with similar interests in what might be deemed networks where bonding links are predominant (Mandelli, 2002; Preece, 1999; Stolle, 1998), but also that the real-life social networks of Internet users seem to actually be larger than those of non-users (Cole, 2000; Hampton & Wellman, 2000; Kestnbaum, Robinson, Neustadtl, & Alvarez, 2002; Uslaner, 2000). There are few better illustrations of the contradicting conclusions such early analyses generated than the results obtained by analyzing e-"villages". Whereas Kavanaugh and Patterson (2002), analyzing the wired community of Blacksburg, Virginia, find that community involvement did not increase, Hampton and Wellman (2000) found that residents of "Netville" (Canada) relied on the Internet for local collective action, and could even observe an increased frequency of communication among residents.

It is fair to say, however, that the peril of revisiting conclusions is not restricted to investigations of wired communities. Kraut et al. (2002) followed up their 1998 study findings and uncovered that the negative effects of Internet access that they had discovered (higher rates of loneliness and social withdrawal, as well as increased symptoms of depression) had disappeared four years later. In their follow-up, the authors discovered that Internet use was generally associated with higher rates of communication, and social involvement. At the same time, those who were more predisposed to be sociable before getting online (extroverts) tended to benefit more from the technology than introverts (see also Birnie & Horvath, 2002; Lee, 2009; Valkenburg & Peter, 2009).

While research has begun to examine the effects of the Internet on social capital, many aspects have been left unexplored; Williams (2006) has called for a closer look on the potential of the Internet to foster bonding social capital specifically. His results (Williams, 2007) seem to indicate that although the Internet displaces bonding social capital offline, it is able to generate bridging social capital online. Drawing on a random sample of 286 undergraduates at Michigan State University, Ellison, Steinfeld, and Lampe (2007) suggested that the Internet (in particular, social networking sites such as Facebook) is able to foster bonding social capital, although it seems much better suited to the creation of bridging social capital.

This conclusion supports previous assumptions that online social networking might serve best as a tool for maintaining weak ties cheaply and efficiently, but not necessarily create or nurture strong ties (Donath & Boyd, 2004). This happens because the form of relationships online (as well as the type of social capital generated as a result of these) is mainly determined by entry and exit costs. Given that the Internet has extremely low entry and exit costs, communities were expected to compensate in breadth what they lacked in depth, and therefore mainly promote bridging social capital (Galston, 2000). Mesch and Talmud (2006), for example, discovered that friendships carried over the Internet were evaluated by individuals as "less close and supportive" (p. 137) than those carried offline. While part of this reason is due to relatively diminished "social cues" which we receive through online channels compared to offline interactions, another reason is that individuals tend to use the two channels for maintaining different types of relationships. Relationships between individuals who are not very socially similar (different perhaps in age, gender, or social status) are easier to maintain through online channels, while stronger bonds are maintained through face-to-face interaction and shared activities (Mesch & Talmud, 2006). Vergeer and Pelzer (2009) found, for example, that the size of a respondent's online social network does not have an influence on the amount of social support they perceive, but rather only the size of the offline network. In this sense, their results confirm the fact that online bonds are weaker than offline relationships.

At the same time, the assumptions mentioned earlier have been questioned by studies that reveal the potential for online relationships to migrate offline. Parks and Floyd (1996) first uncovered that relationships which begin in virtual communities sometimes evolve to the point of including telephone conversations, letters, and even face-to-face communication. McKenna, Green, and Gleason (2002) arrived at a similar finding–the Internet does allow for the formation of close virtual relationships, which prove to be quite durable when migrating to a face-to-face relationship. The anonymity which virtual interaction affords can actually lead to a higher degree of

extraversion, and a higher willingness to disclose aspects of one's "true self". This, combined with the potentially repeated nature of interactions online, can sometimes lead to the formation of close relationships.

The findings in the literature suggest that Internet use is likely associated with social capital at the individual level (e.g., Ellison et al., 2007), although not necessarily of the bonding variety. Relationships started and maintained over the Internet can expose an individual to a diverse array of interaction partners, sometimes spanning considerable distances, in turn leading to higher levels of bridging social capital. If we are to continue along this line, it seems plausible to suspect that people who claim to be active and pro-social in their face-to-face interactions, will exhibit similar tendencies in their online interactions. We naturally bring some of our habits and inclinations from the offline world to the online one. Wright and Li (2011) found, for example, that face-to-face pro-social behaviors are associated with online pro-social behaviors, displayed on social networking sites, or through chat programs or emails. While the authors obtain their findings on a sample of 500 undergraduate students, for a restricted number of pro-social behaviors (four), and without focusing on social capital, their results represent a confirmation of the hypothesis that the online and face-to-face domain of interaction are related. At the same time, some of the things that happen in the online world stimulate different processes compared to the offline one. One would expect that active members of online groups (e.g., chat rooms, listservs) in the Western Balkans will exhibit higher levels of bridging social capital.

There are reasons to doubt the existence of similar connections between online and offline pro-social behavior and social capital in a social context as particular as the Bosnian one. Given the extreme depletion of bridging social capital at the societal level, occasional interactions online between diverse individuals might be able to contribute little to bridging social capital. In this rather pessimistic scenario, a few negative experiences online attributed to individuals belonging to a different ethnic group might result in a further strengthening of in-group interactions online. If pro-social behavior offline targets mainly members of one's own ethnic group, and thus a norm of generalized reciprocity doesn't exist, there is the possibility that an individual would refrain from certain types of online pro-social behavior (e.g., responding to listserv queries), as they could not control who benefits from it. These differences, in our opinion, justify an examination of the phenomenon in the social context of the Western Balkans.

Hypotheses

This study represents an exploratory investigation into the connections between online and offline pro-social behavior, as well as the links between these and social capital in the context of the Western Balkans. Even so, we venture to make six hypotheses, for which the following analyses will attempt to find supporting evidence:

H1. Online and offline social capital will be correlated with each other.

H2. Pro-social behavior in online and offline interactions will be correlated with each other.

H3. Online pro-social behavior is more strongly associated with online social capital than with offline social capital.

H4. Offline pro-social behavior is more strongly associated with offline social capital than with online social capital.

H5. Bridging social capital is more prevalent in online than offline social interactions.

H6. Bonding social capital is more prevalent in offline than online social interactions.

The first two hypotheses correspond to our first two research questions; they simply investigate the existence of an association between social capital online and offline, as well as between pro-social behavior manifested online and offline. Our expectation here is that social capital online and offline will be strongly related, and that individuals who report higher levels of pro-social behavior in their online interactions will be more likely to report similar levels in offline interactions. With respect to pro-social behavior, our intent is also to attempt a replication of previous findings (see Wright & Li, 2011), which find weak yet positive associations between online and offline pro-social behavior. The second pair of hypotheses, roughly corresponding to our third research question, look at the relationship between social capital and pro-social behavior within and across the two domains (offline and online); they claim that social capital and pro-social behavior are more strongly related within than across domains (online or offline). The last two hypotheses examine the prevalence of the two forms of social capital, bridging and bonding, in each domain of interactions (offline and online), suggesting that bridging social capital is more

prevalent in the online domain and that bonding social capital is more prevalent in the offline domain; these correspond to our final research question.

Measurements and design of the study

The database on which the current analysis is based was collected by proMENTE Social Research, in cooperation with the SouthEastern European Youth Network (http://www.seeyn.org) and the United Nations Volunteers' (http://www.unv.org) office in Bosnia and Herzegovina, which provided the funding for the research.

Sample

A web questionnaire was prepared on a proMENTE server, and respondents were invited to fill in the questionnaire via online links and advertisements. In order to motivate potential respondents, participation also enabled them to be included in a lottery in which they could win a modest prize of a portable mp3 player. In order to reach a broad population of Internet users, the links were placed on a variety of web sites–in particular, Facebook (http://www.facebook.com) and Sarajevo X (http://www.sarajevo-x.com); the latter is very popular in the region, especially in Bosnia and Herzegovina. On Facebook, the survey was administered via a Facebook application called "How pro-social are you?" The questionnaire was online from September to December 2008. Two booster samples of volunteers were also included; on the one hand, traditional "offline" volunteers, and on the other, "online volunteers"–active members of online communities who devote their time for the general good/helping others (in particular, activists on the Wikipedia online encyclopedia). Active volunteers were oversampled as pro-social behavior online and offline was the main focus of the research and it was anticipated that they would otherwise form a relatively small part of the sample.

While being a self-selected sample, the need to obtain a sizable share of Internet users made administering a questionnaire to a representative sample of individuals in Bosnia and Herzegovina, Serbia, and Croatia prohibitive in terms of costs. The final database consists of 1912 respondents who completed the online questionnaire in Bosnia and Herzegovina, Serbia, and Croatia; a breakdown of the respondents according to the website from which they were directed to the online questionnaire can be seen in Table 1.

Table 1
Number, Age and Gender of Respondents in the Sample (Broken Down by Website of Origin)

Website through which the respondent came	**Number of respondents**	**Average age of respondents**	**Gender of the respondents**	
			Male	Female
Volunteers	116	24.09	43	73
Facebook	1146	25.43	570	576
Wikipedia	269	26.72	139	130
Sarajevo-X	378	26.68	269	109
Total	1909	25.78	1021	888

The self-selected and skewed nature of our sample becomes evident when examining, in Table 2, a breakdown of the populations of Bosnia and Herzegovina, Croatia, and Serbia, and comparing those with our sample. In our pool of respondents women are slightly underrepresented, compared to their proportion in the population, while the 15–24, and 25–34 age groups are clearly overrepresented. These two groups comprise about 28 percent of the population in Bosnia and Herzegovina, and roughly 26 percent in Serbia and Croatia, while they represent about 88 percent of our sample. At the same time, it is worth keeping in mind that the population of Internet users in these three countries is likely closer to the structure of our sample than the actual population is, with significant variation between countries.[2]

Instruments and measures

The research instrument used in this research is comprised of: (1) a section comprised of a shortened version of the questionnaire on altruism developed by Rushton, Chrisjohn, and Fekken (1981), (2) a pro-social online behavior set of items designed specifically for this study, (3) a section focusing on social capital on the Internet (Williams, 2006), and (4) a section containing items that focus on social capital in everyday "offline" situations (Williams,

[2]A similar table with only the Internet-active population of Bosnia and Herzegovina, Croatia and Serbia could not be generated. EUROSTAT indicators only include the proportion of 16-74 year olds in the population who regularly use the Internet for these countries. The national statistical offices either provide only a breakdown based on gender (Croatia), or Internet usage within gender and age categories without also offering absolute frequencies (Serbia).

2006). The latter two batteries of questions comprise the Internet Social Capital Scales (ISCS), which Williams (2006) validated.

Table 2
Breakdown of the Sample and the Population in Bosnia and Herzegovina, Croatia and Serbia Based on Gender, Age, and Area of Residence

	Country		
	Bosnia and Herzegovina[a]	Croatia[b]	Serbia[c]
		Population	
Gender (100%)			
Male	48.86	48.23	48.64
Female	51.14	51.77	51.36
Residence (100%)			
Urban	46.86	57.54	52.22
Rural	53.14	42.46	47.78
Age (100%)			
0–14	17.46	15.31	15.12
15–24	14.69	12.32	12.22
25–34	13.25	14.05	14.08
35 and above	54.60	58.32	58.58
		Sample	
Gender (100%)			
Male		53.5	
Female		46.5	
Residence (100%)			
Urban		-	
Rural		-	
Age (100%)			
0–14		1.9	
15–24		52.5	
25–34		35.3	
35 and above		10.4	

Note. Cell values are percentages, which sum up to 100% in each category.
[a]For Bosnia and Herzegovina, information on the gender and age structure of the population (in 2007) was obtained from *Men and Women in Bosnia and Herzegovina*, published in 2009 by the Agency for Statistics of Bosnia and Herzegovina (http://www.bhas.ba/tematskibilteni/ZIM_2009_001_01-bh.pdf). The information on the urban/rural structure of the population was obtained from the World Bank's World Development Indicators. [b]For Croatia, information on the gender and age structure of the population was obtained from the 2010 Statistical Yearbook, published by the Croatian Bureau of Statistics (http://www.dzs.hr/Hrv_Eng/ljetopis/2010/SLJH2010.pdf). The information on the urban/rural structure of the population was obtained from the World Bank's World Development Indicators. [c]For Serbia, information on the gender and age structure of the population was obtained from the 2010 *Demographic Yearbook of the Republic of Serbia*, published by the Statistical Office of the Republic of Serbia (http://webrzs.stat.gov.rs/WebSite/repository/documents/00/00/55/97/DEM_2010.zip). The information on the urban/rural structure of the population was obtained from the World Bank's World Development Indicators.

Given that the questions were translated from English into Bosnian, a pilot study was conducted with students of psychology at the Faculty of Philosophy, University of Sarajevo (N=44); this allowed the team to verify whether the questions used were clear and understandable. This was followed by a second pilot study on a sample of students from the same Faculty (N=54) which had the aim of shortening the questionnaires. The questionnaires on pro-social behavior and social capital in online and offline contexts were shortened using factor analysis in order to decrease the number of questions with minimal loss of information. The instruments used in this survey are summarized in Table 3.

Factor analyses were conducted on the sets of questions measuring offline and online pro-social behavior (pro-social behavior), yielding two factors. For offline pro-social behavior, the two factors explain about 47 percent of the variance. The method through which the factors were obtained is Oblimin with Kaiser normalization (preferable when one expects the factors to be correlated with each other to a certain extent, as would be the case with facets of pro-social behavior). The Kaiser-Meyer-Olkin measure of sampling adequacy is 0.865. The items on Factor 2 only receive high scores for those who own a car (along with the appropriate technical skills to fix it), which is only a relatively small percentage of this population. For this reason, Factor 1 was called "generalized pro-social behavior offline", and Factor 2 "specific pro-social behavior offline".

Table 3
Items Measuring Level of Social Capital (Bridging/Bonding) and Pro-Social Behavior (Online/Offline)

Set	**List of questions**
Rushton (1981)	How often do you help others carry heavy things? How often do you give up your place in line for a person behind you (e.g., at the supermarket)? How often do you willingly take care of other people's children, pets or plants free of charge? How often do you willingly give up your place in a crowded bus/tram? How often do you assist others in moving entirely, or moving things in another room? How often do you loan money to a friend who urgently needs it? How often do you help others when they're having car problems (e.g., changing tires, pushing the car)? How often do you offer transportation to others in your car? How often do you offer assistance when others need it (friends, neighbors)? How often do you offer help to elderly or disabled persons when they have problems moving?
Internet Social Capital Scales (in online and everyday offline situations); ISCS (Williams, 2006)	To what extent to you agree/disagree with the following statements...? "Through interaction with other people I become interested in things that happen outside of my city". "By talking to people I become interested in other places in the world". "Interacting with people makes me feel part of a larger community". "Interacting with people makes me feel that everyone in the world is connected". "Interaction makes me feel part of the 'bigger picture'". "I have no one with whom I can talk about intimate personal problems". "People with whom I communicate would stand up for me". "People with whom I communicate would share their last cent with me". "People with whom I communicate would help me in the fight against injustice".
Online pro-social behavior items	How often do you reply to an email from someone you know who seeks help or information? How often do you sign a petition on the Internet? How often do you forward a petition on the Internet? How often do you answer questions that people put on Internet forums or mailing lists? How often do you report or comment on someone's behavior on the Internet? How often do you provide information and help to people you do not know on MSN / Yahoo Messenger etc? How often do you send emails to five or more email addresses to point out something useful? How often do you forward an email that you feel would be of help to others for their work, education, health or family? How often do you contribute to Wikipedia or a similar site? How often do you willingly fill out questionnaires / surveys on the Internet so as to help other people or organizations? How often do you forward an email from someone that asks for help or information?

For online pro-social behavior, the analysis again identified two factors. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.858 in this case, and the factors extracted explain 53 percent of the variance. In this case, a distinction can be made between "institutionalized" and "non-institutionalized" pro-social behavior on the Internet. The second factor seems to be referring to pro-social behavior which happens through established online channels (Wikipedia, forums, MSN Messenger, or an institution which handles complaints regarding a user's lack of "netiquette"), while the first happens through non-institutionalized channels. One question could not be precisely included in either of the two factors, given its tendency to load equally strong on both factors (0.41 and 0.35). This item (taking part in online surveys) seems to be completely unrelated to the other ones, as evidenced by its tendency to diverge from the two factors identified here.

We then conducted factor analyses on the items which probed the two dimensions of social capital for online and offline interactions; although full results will not be presented here, they can be made available from the authors, upon request. In both cases, two factors were extracted, by relying on Oblimin rotation with Kaiser normalization. For offline interactions, the two factors extracted together explain 58 percent of the variance, while the Kaiser-Meyer-Olkin measure of sampling adequacy is 0.798. For online interactions, the two factors extracted together explain about 63 percent of the variance, while the Kaiser-Meyer-Olkin measure of sampling adequacy is 0.796. In the case of both indices, the factors extracted include the same items: the first five items group together (interactions which produces feelings of integration into a wider whole, and connection to a world larger than one's immediate surroundings), as do the last three items (interaction which produces tight-knit relationships of mutual support). In both instances, the sixth item ("I have no one with whom I can talk about intimate personal problems") did not load properly on either of the factors, and was therefore excluded. In the case of both factor-based scales (bridging/bonding), higher values denote higher levels of social capital.

Descriptive results and interpretation

The first part of this section looks at the descriptive results at item and scale level for pro-social behavior and social capital, while the second part specifically targets the six hypotheses mentioned earlier. Hypothesis 1 looks at the association between online and offline social capital, whereas Hypothesis 2 examines the similar association between online and offline pro-social behavior. In each of these cases, a distinction is made between the two types discovered by means of factor analysis. Following these simple analyses, we continue by examining Hypotheses 3 and 4. These compare the effects which the different types of pro-social interaction (generalized offline, specific offline, non-institutionalized online, and institutionalized online) have on different types of social capital (online/offline, and bridging/bonding). The expectation was that online pro-social behavior has a stronger effect on online social capital, irrespective of the specific type of pro-social behavior or social capital. Conversely, offline pro-social behavior will have a stronger effect on offline social capital, irrespective of the type of social capital or pro-social behavior. The comparison is achieved by running a series of OLS regressions with the different types of social capital as dependent variables, and then comparing the coefficients for the same independent variable across models.

Finally, we conclude the section by putting Hypotheses 5 and 6 to the test. The focus will be on aggregate levels of bridging and bonding social capital in online and offline interactions, in an attempt to show that whereas there tend to be higher levels of bridging social capital in offline situations, in online interactions bonding social capital is more prevalent. These analyses employ t-tests.

Descriptive overview

Pro-Social Behavior. A brief look at the distributions (not reported here) shows that most respondents frequently engage in at least one act of pro-social behavior in the offline world, whether it is helping with carrying heavy things, giving up a seat in a crowded bus/tram, or loaning money. Generally, a majority of respondents have, in the past, cared at least once for other people's pets or plants free of charge (66 percent), helped others move (residence, or simply assist with moving pieces of furniture) at least once (82 percent), helped with car problems (63 percent), or helped elderly persons who had problems moving (81 percent). In the case of a few pro-social behaviors, a majority have pursued them 'often' or 'very often': giving up one's place in a crowded bus or tram (71 percent), or giving up one's place in line at the supermarket for a person behind them (53 percent).

For online pro-social behavior two tendencies seem to be at play: for acts that involve forwarding emails that might be of help to a friend, replying to an email asking for information, filling in online questionnaires, replying on Internet forums, or sending emails to five or more addresses, the tendency is for a majority to report engaging in this more than once. The remaining activities (editing Wikipedia, reporting someone's behavior on the Internet, signing or forwarding a petition) are pursued by a majority of respondents only once, or never.[3] The differences between the two sets of items can partly be explained by the varying costs and benefits associated with each behavior: whereas forwarding or replying to an email is a low-cost activity, editing Wikipedia or reporting someone's behavior on the Internet involves considerably larger costs.

Table 4
Means for Online and Offline Pro-Social Behavior Scales

	Source			
	Volunteers	Facebook	Wikipedia	Sarajevo-X
Generalized offline	16.47	17.32	16.85	17.19
Specific offline	4.25	5.14	4.98	5.17
Non-institutionalized online	13.61	13.92	12.37	13.71
Institutionalized online	6.22	7.56	7.35	7.64
TOTAL	116	1147	271	378

Note. N=1912. Table entries are means computed for each pro-social behavior scale, based on the website of respondents' origin.

There is little difference in the distribution of answers in terms of the website through which the respondents were recruited in the sample. While differences can be observed based on the website of origin, these are not particularly large or systematic, and allow us to conduct subsequent analyses on the pooled sample of individuals. Table 4 displays the means of our constructed online and offline pro-social behavior factor-based scales, according to the website from which the respondents entered our sample. Each cell presents the average extent of pro-social

[3]In the interest of efficiency, we did not present complete breakdowns of answers for pro-social behavior items online and offline. The tables are available from the authors upon request.

behavior of individuals coming into our sample from particular websites. Although there are some systematic variations (respondents from Facebook and Sarajevo-X tend to consistently have higher scores that those from other websites), there is a surprising degree of consistency as well, particularly for the scales constructed from a large number of items. We can state that there is little evidence of systematic differences in our constructed measures of pro-social behavior based on the website of origin.

Social Capital. Turning to the questions intended to measure online and offline social capital, there is a clear distinction between the degree of social capital which is associated with online and offline social interactions. Whereas the correlations between offline and online social capital items are quite high for those that measure whether the respondent feels part of a larger community as a result of interacting with people, whether he/she feels that they become interested in other places in the world and in events happening outside of their daily existence, the same is not true about the final items in Table 5. In the case of situations which require a high degree of personal involvement (intimate personal problems, helping with money, or helping a friend fight an injustice), there is a clear discrepancy between the online and offline world, as evidenced by the low correlation coefficients (Spearman's ρ, since the questions were measured on five-point scales). Given that the first five questions focus on bridging, while the last four focus on bonding social capital, the results suggest that the individual items tapping bonding social capital for online and offline interactions are only weakly associated with each other.

Table 5
Correlations Among Social Capital Items in Online and Offline Interactions

Item	**Spearman's *ρ***
Through interaction with other people I become interested in things that happen outside of my city	.526 [.493; .558]
By talking to people I become interested in other places in the world	.597 [.567; .626]
Interacting with people makes me feel part of a larger community	.512 [.478; .545]
Interacting with people makes me feel that everyone in the world is connected	.532 [.498; .564]
Interaction makes me feel part of the "bigger picture"	.599 [.569; .628]
I have no one with whom I can talk about intimate personal problems	.299 [.257; .339]
People with whom I communicate would stand up for me	.301 [.259; .342]
People with whom I communicate would share their last cent with me	.344 [.303; .383]
People with whom I communicate would help me in the fight against injustice	.396 [.358; .434]

Note. N=1868. Due to the 5-point scale on which the answers were recorded, we computed Spearman's rank order correlation coefficient, *ρ*. All coefficients were significant at the $p < .001$ level.

Hypothesis testing

Hypothesis 1. Social capital online and offline

When we examine the partial correlation results between our constructed scales of online/offline bridging/bonding social capital, we first find that there is indeed a common factor within social capital whose online and offline manifestation are weakly correlated, and that in some cases the relationship is stronger than that reported above for individual items. Table 6 shows the partial correlations between the scales computed as a result of the factor analyses, while controlling for age, gender, and whether the respondent is a volunteer for an organization. We can see that there is a connection between all four types of related social capital varieties, with correlations ranging between 0.180 and 0.657 (all statistically significant at the .001 level). Moving past this very general perspective, it's evident that the strongest connection exists between online and offline manifestations of the same type of social capital (either bridging or bonding). The strongest relationships observed are between bridging capital online and offline, $r(1854) = 0.657$, $p < .001$, and between bonding social capital online and offline, $r(1854) = 0.383$, $p < .001$. This stands in clear contrast with the association between *different* types of social capital online and offline, where the magnitude of the relationship is considerably smaller. The confidence intervals obtained for the two correlation coefficients presented above further reinforce our assessment, as they do not intersect those of the other correlations presented in the table.

Table 6
Partial Correlations Among Factor-Based Scales of Online and Offline Social Capital (SC)

	Bonding offline SC	**Bridging online SC**	**Bonding online SC**
Bridging offline SC	.262* [.206; .316]	.657* [.616; .697]	.180* [.129; .228]
Bonding offline SC	-	.205* [.151; .262]	.383* [.333; .430]
Bridging online SC	-	-	.287* [.243; .332]

Note. $N = 1854$ for all correlations. The partial correlations control for a respondent's age, gender, and whether they are a volunteer in an organization or not. Confidence intervals for a 95% confidence level were obtained through bootstrapping with 1000 samples drawn.
*$p < .001$.

We can conclude this brief analysis by stating that we have found support in favor of our first hypothesis: regardless of the type of social capital examined, its online and offline manifestation are indeed correlated with each other. At the same time, we need to qualify this hypothesis by recognizing that the strongest association, as measured by Pearson's *r*, is found to exist between the same type of social capital, bridging or bonding, as it is manifested in online and offline settings. The other associations, e.g. between bridging offline social capital and bonding online, or even bonding offline social capital, are weaker.

Hypothesis 2. Pro-social behavior online and offline

As Table 7 shows, there is a positive and medium strength correlation between the two scales measuring online pro-social behavior, $r(1858) = 0.511$, $p < .001$. The relationship between the two scales measuring offline pro-social behavior is of a similar strength and direction, $r(1858) = 0.429$, $p < .001$. However, in terms of correlations between online and offline pro-social behavior, the only one which is comparable in strength with the previous two is between non-institutionalized online pro-social behavior and generalized offline pro-social behavior, $r(1858) = 0.417$, $p < .001$.

Table 7
Partial Correlations Among Factor-Based Scales of Online and Offline Pro-Social Behavior (PSB)

	Specific offline PSB	**Non-institutionalized online PSB**	**Institutionalized online PSB**
Generalized offline PSB	.429* [.388; .469]	.417* [.380; .458]	.273* [.228; .318]
Specific offline PSB	-	.226* [.180; .274]	.153* [.109; .201]
Non-institutionalized online PSB	-	-	.511* [.469; .545]

Note. $N = 1858$ for all correlations. The partial correlations control for a respondent's age, gender, and whether they are a volunteer in an organization or not. Confidence intervals for a 95% confidence level were obtained through bootstrapping with 1000 samples drawn.
*$p < .001$.

This suggests that people who claim to be pro-social offline tend to also report being pro-social online, confirming the expectation behind our second hypothesis. Just like in the previous section, however, we can qualify this general statement by pointing out that the strongest associations are generally found for pro-social behavior that takes place within the confines of the online or offline environment. The only exception to this pattern we find is the medium strength correlation between generalized offline and non-institutionalized online pro-social behavior. The confidence intervals presented in Table 7 support this interpretation, as the ones for the three strongest associations found never intersect those of the other three correlations reported in the table. We interpret the moderately strong association found between generalized offline and non-institutionalized online pro-social behavior as limited evidence for the existence of a global "pro-social" factor which can manifest itself in interpersonal interactions both online and offline. At the same time, specific considerations of costs and benefits associated with action online or offline, as well as the context in which each pro-social act takes place (anonymity online, public forums online, or public spaces offline) lead to a considerable share of unexplained variance in the relationship between pro-social behavior online and offline.

Hypotheses 3 and 4. Pro-social behavior and social capital within and across domains: Regression analyses

After constructing each factor-based scale, we used our computed measures of offline and online social capital, both bridging and bonding, as dependent variables in a series of regressions (see Table 8). The independent variables used in these regressions were our constructed measures of online and offline pro-social behavior, together with (as additional covariates) the respondents' age, their gender, whether they do any volunteer work, and how much volunteer work they engage in. In effect, this offers a stronger test of our first pair of hypotheses, as we are able to control for more variables, and vary the sample size on which the relationship is tested.

The standardized coefficients presented in Table 8 reveal interesting findings about the relationships between some of the independent variables in our models and the various types of social capital. Gender displays a statistically significant effect only on offline social capital, both bridging and bonding (see the estimates presented for Models 1 and 2) – men tend to have lower average levels of offline social capital than women. However, no such gender gap was observed for online social capital. Moving on to whether the respondent is a volunteer in an NGO or not, we find another interesting pattern: being a volunteer has a negative effect on bridging social capital, both online and offline, but no statistically significant effect on bonding social capital. Although our survey did not include questions on the membership type and organizational structure of the NGOs in which the respondents were members, one explanation for the finding is that most voluntary associations in the region lack a cross-cutting membership (Powell, 2009). Being an active member in such a group would probably be conducive to lower levels of bridging social capital.

Moving past the findings generated from Table 8, our third and fourth hypotheses require that we engage in four pairs of comparisons in terms of the effect of a particular independent variable on social capital online, as opposed to offline: (1) of offline pro-social behavior, generalized and specific, on bridging social capital; (2) of online pro-social behavior, non-institutionalized and institutionalized, on bridging social capital; (3) of online pro-social behavior, non-institutionalized and institutionalized, on bonding social capital; and, finally, (4) of offline pro-social behavior, generalized and specific, on bridging social capital. These comparisons can be seen in Table 9, with the first set of comparisons presented in the upper left hand side quadrant, and the following ones in clockwise order from this point.

The Chi-squared test values reported in the cells for the difference in estimates for the same dependent variable from two different regression models were obtained by using the *suest* ("seemingly unrelated estimation") command in Stata. *Suest* uses these estimates, together with their variance/covariance matrices, to create a single vector of estimates and a robust variance/covariance matrix.[4] This is appropriate even in cases, such as ours, where the estimates were obtained from different models, run on different samples.

Focusing first on our third hypothesis, which predicts that online pro-social behavior is more strongly associated with online social capital than with offline social capital, we can conclude that the comparisons between estimates represent supporting evidence for such an interpretation. Regardless of whether we are dealing with bridging or bonding social capital, the last two columns of Table 9 show that online pro-social behavior consistently displays a stronger influence on online social capital. To give one example, the results which *suest* obtains by combining the estimates and variance/covariance matrices from Model 1 and Model 3 suggest that the effect of institutionalized online pro-social behavior on online bridging social capital is 0.127 (statistically significant at the .001 level), whereas its effect on offline bridging social capital is −0.001 (not significant). The Chi-squared test for the difference between the two estimates is 9.88, statistically significant at the .01 level, and shows that the effect of institutionalized *online* pro-social behavior is stronger on *online* bridging social capital. The other results from the last two columns of Table 9 can be interpreted in the same way. The only instance where this assessment might be questioned is in the case of the influence of non-institutionalized online pro-social behavior on bonding social capital offline and online, where the difference between the two estimates is not statistically significant at the .05 level.

Turning now to our fourth hypothesis, we can see that we find little support in the data for our assumed stronger influence of offline pro-social behavior on offline social capital than on online social capital. The first two columns of Table 9 show the tests for the difference in estimates, and most are not statistically significant at a conventional .05 level of confidence. To take one example, the effect of specific offline pro-social behavior on offline bridging social capital is −0.034 (not statistically significant), and its effect on online bridging social capital is −0.024 (also not statistically significant). The Chi-squared test for the difference between the two estimates is 0.05, not statistically significant at the .05 level, and suggests that the effects of specific offline pro-social behavior on offline and online bridging social capital cannot be assumed to be significantly different from each other in the wider population.

Hypotheses 5 and 6. Bridging and bonding social capital: Online and offline prevalence

While the analyses above do confirm three out of our first four hypotheses, they do not say anything regarding the relative importance of online as opposed to offline bridging and bonding social capital (H5 and H6). In order to find this, we simply computed mean scores for each item measuring bridging or bonding social capital in both online and offline situations, and computed a paired-samples t-test, to see if the difference between the two means (for online and offline situations) was statistically significant. The results can be seen in Table 10.

[4]More information about the post-estimation command used can be found at http://www.stata.com/help.cgi?suest.

Table 8
Predicting Four Types of Social Capital (Online or Offline, Bridging or Bonding)

	Offline bridging (Model 1)		**Offline bonding (Model 2)**		**Online bridging (Model 3)**		**Online bonding (Model 4)**	
	BETA	*t* value	BETA	*t* value	BETA	*t* value	BETA	*t* value
Intercept	-	-	-	-	-	-	-	-
Age	.01	.32	−.132***	−3.82	.038	1.14	−.013	−.37
Gender: male	−.081*	−2.28	−.104**	−2.84	−.035	−.98	.011	.29
Volunteer work	−.096**	−2.76	−.032	−.90	−.072*	−2.06	−.033	−.93
Hours spent volunteering	−.029	−.84	.032	.89	−.060	−1.72	.032	.91
Generalized offline PSB	.213***	5.45	.203***	5.04	.113**	2.90	.118**	2.94
Specific offline PSB	−.025	−.65	.060	1.53	−.015	−.38	.091*	2.32
Non-institutionalized online PSB	.195***	4.83	.035	.84	.237***	5.84	.117**	2.81
Institutionalized online PSB	−.001	−.03	.011	.27	.116**	3.03	.106**	2.70
R^2	.150		.093		.152		.104	
N	839		839		831		831	

Note. The cells report standardized regression coefficients.
***$p < .001$; **$p < .01$; *$p < .05$.

Table 9
The Influence of Pro-Social Behavior (PSB), Online and Offline, on Different Types of Social Capital, for Online and Offline Interactions

	Offline		**Online**	
	Generalized	Specific	Non-institutionalized	Institutionalized
Bridging SC: offline vs. online	3.51†	0.05	4.48*	9.88**
Bonding SC: offline vs. online	1.39	0.86	3.76†	4.62*

Note. $N = 839$. Each cell reports χ^2 test values of the difference between estimates of effects of the same type of pro-social behavior (e.g., offline generalized) on bridging or bonding social capital, across the online and offline domains of interaction.
***$p < .001$; **$p < .01$; *$p < .05$; †$p < .10$.

The results here only offer support for one of our last two hypotheses. Only one of the items that measures the extent of bridging social capital ("Interacting with people makes me feel that everyone in the world is connected") displays the pattern we expected–higher average values for online compared to offline interactions, $t(1867) = -8.559$, $p < .001$. The difference in means for other items in this group either did not achieve statistical significance ("Through interactions with other people I become interested in things that happen outside of my city"), or was in the opposite direction to what we expected–higher scores for offline than online interactions, e.g., $t(1867) = 10.447$, $p < .001$ ("Interacting with people makes me feel part of a larger community"). H5, therefore, finds no support in our sample – levels of bridging social capital online and offline in the population cannot be said to differ from one another.

H6, however, receives full support from our analysis: across all four items in the battery, average scores for *bonding* social capital are higher for offline interactions than for online interactions. The differences in means are all highly statistically significant (see last four rows in Table 10). We conclude that across all four items that measure bonding social capital, respondents in our sample report a higher degree of social support encountered in their offline interactions than online ones. Whether it be for sharing details about a personal crisis, counting on monetary support in a situation of crisis, or moral support in a conflict situation, relationships maintained through offline means seem more important than those kept through online channels.

Discussion

The data supports four out of our initial six hypotheses. Online and offline social capital have indeed been found to be associated with each other (H1); at the same time, we have found that the strongest associations between online and offline interactions exist between pairs of social capital variables of the same type, bridging or bonding (see Table 6). Similarly, pro-social behavior online and offline have been shown to be associated with each other (H2), confirming the findings of previous analyses (Wright & Li, 2011). When it comes to the connection between pro-social behavior and the different types of social capital, which represents the focus of Hypotheses 3 and 4, only Hypothesis 3 has been supported by our analyses. As revealed in Table 9, we have only been able to confirm that online pro-social behavior is more strongly associated with online rather than offline social capital. When our focus turned to offline pro-social behavior, we could find no statistically significant difference in terms of the strength of its association with offline social capital, compared to online social capital. Finally, when investigating what type of social capital is prevalent in online and offline interactions, only one of our two hypotheses (H5 and H6) was confirmed –aggregate levels of bonding social capital were, indeed, higher in offline interactions than in online interactions (H5). The converse was shown not to be true: levels of bridging social capital also tend to be slightly higher in offline interactions compared to online ones.

Although the manifestations of each trait (pro-social behavior and social capital) in the online and offline domains are related to each other, they also exhibit a certain measure of "domain specificity". When referring specifically to pro-social behavior, it can be surmised that other factors, such as considerations of cost, of social benefits derived from the helping act, or characteristics of the relationship between helper and person being helped, also play a role in the decision of whether to be pro-social online or offline. Seen from the perspective of the online vs. offline behavior, our results provide indirect confirmation of the findings of Mesch (2012): the set of factors that influence behavior online is related but not entirely identical to those factors that influence offline behavior.

A particularly interesting finding was obtained from our comparison of regression estimates in Table 9, and revealed that online pro-social behavior has a stronger association with social capital online than offline. Although we can see that non-institutionalized online pro-social behavior has an effect on both online and offline social capital (the only exception is the lack of an effect on offline bonding social capital, in Model 2 of Table 8) its effects on online social capital are stronger than on offline social capital. On the other hand, no such disparity can be seen for the effects of offline pro-social behavior on online and offline social capital; our analysis revealed that the estimates are, for all intents and purposes, equal. In this sense, we might surmise that although online acts of pro-social behavior have effects that "spill-over" and influence even a respondent's attitude toward the personal benefits of offline interactions, the effects on the attitudes toward online interactions are stronger. While online interactions may help to some extent in compensating for low levels of bridging social capital offline (see Model 1 in Table 8), their influence on social capital manifested online is stronger.

Other findings generated by our multivariate analyses had not been anticipated by any hypothesis, but are still worthy of a brief mention here, as they speak to the dynamics between social capital, pro-social behavior, and socio-demographic factors. Gender displays an effect on the extent of offline social capital, but not on online social

Table 10
The Prevalence of Social Capital (Bridging/Bonding) Online and Offline

Item	Mean score offline	Mean score online	*t*-value	*df*	Sig. (2-tailed)	95% CI
Bridging social capital						
Through interaction with other people I become interested in things that happen outside of my city.	4.03	4.06	−1.41	1867	.158	[−0.07; +0.01]
By talking to people I become interested in other places in the world.	4.39	4.26	7.64	1867	.000	[+0.09; +0.16]
Interacting with people makes me feel part of a larger community.	4.14	3.91	10.42	1867	.000	[+0.19; +0.28]
Interacting with people makes me feel that everyone in the world is connected.	3.90	4.09	−8.56	1867	.000	[−0.23; −0.15]
Interaction makes me feel part of the "bigger picture".	3.77	3.72	2.43	1867	.015	[+0.01; +0.10]
Bonding social capital						
I have no one with whom I can talk about intimate social problems[5].	2.12	2.90	−22.48	1867	.000	[−0.85; −0.72]
People with whom I communicate would stand up for me.	3.80	2.93	32.34	1867	.000	[+0.81; +0.92]
People with whom I communicate would share their last cent with me.	3.46	2.59	31.37	1867	.000	[+0.82; +0.93]
People with whom I communicate would help me in the fight against injustice.	3.74	3.26	19.06	1867	.000	[+0.43; +0.53]

Note. $N = 1868$. CI = confidence intervals. *df* = degrees of freedom. Sig. = level of statistical significance.

[5]As this question has negative valence, the scores in this table should be understood in the opposite sense to those of the other items.

capital as well: men tend to report lower average levels of offline social capital than women. The findings regarding online social capital (both bridging and bonding) from our sample of Internet users from the Western Balkans confirm those of Ellison et al. (2007), obtained on a sample of college students in the US: gender is not gender with a grain of salt, as our convenience sample of Internet users is potentially not representative of the population of Internet users in the region, and certainly not representative of the wider population in the Western Balkans. Our finding about gender effects on offline social capital might not stand up to an analysis done on a representative sample of both Internet users and non-users. A second finding relates to the influence of non-institutionalized online pro-social behavior on offline social capital, where an effect can only be found for the bridging type. This is in line with arguments made by Donath and Boyd (2004), who reason that Internet social networking sites may be more helpful in maintaining weak connections (bridging social capital) than strong ones (bonding social capital). The evidence here matches this: non-institutionalized online pro-social behavior is a statistically significant predictor of offline bridging social capital, but not also of offline bonding social capital.

However, unrestrained optimism at the thought of online interactions stimulating bridging social capital in the context of Western Balkan societies, and compensating for face-to-face interaction within homogeneous groups, is not warranted. As we saw from Hypothesis 3, the influence of online pro-social behavior is still stronger for online social capital rather than its offline counterpart. Furthermore, our expectation that bridging social capital would be more prevalent online compared to offline interactions was not confirmed by the evidence. When comparing the extent of bridging social capital in the online and offline sphere of interactions (see Table 10), we are forced to conclude that there are no differences – for one item, there is, on average, slightly more bridging social capital online than offline, for another there is no statistically significant differences between the two, while the last three items display a clear difference in aggregate bridging social capital, in favor of offline interactions.

Our analyses present the reader with a bittersweet set of conclusions. On the one hand, although online communication channels might be used predominantly to maintain weak ties rather than form new ones, as Mesch and Talmud (2006) suggested, our results show that exchanges carried out online still impact attitudes relating to offline interactions. At the same time, online exchanges continue to have a stronger effect within their own domain: online social capital receives a larger 'boost' from online pro-social behavior compared to offline social capital.

Limitations

The results presented so far should be evaluated through the prism of the limitations inherent in the analysis, which stem in particular from the nature of the sample and the measurement instruments on which we relied. The convenience sample employed throughout the analysis does not allow us to generalize our conclusions to the Internet-active population in Bosnia and Herzegovina, Croatia, and Serbia. Furthermore, the self-selected nature of the sample most likely leads to an over-representation of individuals who display above-average levels of pro-social behavior, despite our efforts to limit this bias by offering the possibility of winning a prize, and thus appealing to individual self-interest rather than pro-social tendencies. While this was the only feasible strategy in which such a study could be conducted with the limited resources available, our inferences would benefit from future confirmation on representative samples of the relevant populations.

The second important limitation stems from the battery of questions we used in measuring bonding/bridging social capital online/offline, as well as pro-social behavior online/offline. While the items used for the social capital scales have been shown to display reliability and construct validity by Williams (2006), and have been successfully employed in other analyses as well (e.g., Ellison et al., 2007), the scale has not, to the best of our knowledge, been validated across different societal or cultural environments. Our pro-social behavior scale, however, still requires validation that goes beyond exploratory factor analysis, as well as beyond the South-Eastern European context. Related to this is our inability to control for social desirability effects in our questionnaire: there is a natural tendency for respondents to claim that there are more pro-social than they actually are, as they perceive altruistic behavior to be socially valued and wish to avoid the personal judgment they would be subjected to if they reported not helping anyone at all. In this sense future research might strive to obtain cross-validated reports of pro-social behavior, which are easier to obtain for online rather than for offline behavior (replies on forum queries, email chains which present a record of all individuals that forwarded the message etc.).

Finally, considering the rapid rate at which behavior online finds new arenas of expression and new forms, there is the possibility that certain manifestations which we tried to capture had already become 'obsolete' by the time our study was conducted, or replaced by others which we did not probe for. Even if we allow for this possibility, a 'core' of behaviors (signing petitions, replying to or forwarding emails, using MSN/Yahoo Messenger) which we probed for still remain established ways to offer assistance and information to others.

Conclusions

We have highlighted here the existence of a link between online and offline pro-social behavior and bridging and bonding social capital. Furthermore, with respect to online pro-social behavior, we have suggested that its effects are stronger on online social capital (regardless of whether it is bridging or bonding). Offline interactions were shown to be associated with bonding social capital to a greater extent than online interactions, suggesting that there is some disparity between online and offline interactions in terms of the ties they foster or help maintain. On a less favorable note, the expected finding concerning online interactions, that they would be associated with higher levels of bonding social capital, was not confirmed by the data. This points to the need to focus deeper on the particular ways in which the Internet is used to maintain old and form new relationships across different social contexts, as we suspect this provides an answer to why one of our expectations was not confirmed.

A surprising finding of our multivariate analyses was that offline bridging social capital can benefit from online interactions. An optimistic interpretation is that this provides some hope for a gradual increase in the extremely low levels of bridging social capital observed in Western Balkan societies. At the same time (the pessimist reverse), there is the possibility that only those with high rates of bridging social capital engage in online pro-social acts. The fact that the costs of forwarding an email, or answering a question on a forum, are minimal, lead us to support the former scenario as more plausible, although not to the point of completely disregarding the latter one.

Nixon et al. (2009, p. 67) reported that about a third of individuals in Bosnia-Herzegovina give some form of "everyday assistance" to someone who is not a family member or a close friend, under the form of help with cleaning, cooking, baby-sitting, writing letters or translating, helping with transportation, harvesting, or construction. Our survey has shown that a considerable share of Internet users in the region also engage in online acts of assistance, although rarely with a higher frequency than several times a month. The fact that these two forms coexist and are both associated with increases in offline bridging social capital was a welcomed unanticipated finding. It suggests that future analyses of pro-social behavior and its effects should likely focus on both online and offline manifestations, as they are not completely overlapping in terms of effects.

In spite of the limited focus of our investigation, the analysis has contributed to a better understanding of the links between online and offline pro-social behavior and its connection to social capital. Further work, particularly in the geographical context of the Western Balkans, ought to be pursued, as our investigation has left open a number of issues. It remains unclear whether the particular tendency of women to be report being more pro-social offline compared to men is an artifact of our convenience sample, a result which is valid only for a particular geographical/cultural setting, or a universal tendency. Furthermore, the link between social capital and pro-social behavior could benefit from further investigations, particularly for individuals who have experienced negative interactions (e.g., bullying) in the online communities of which they are members.[6] Finally, as was mentioned in the previous section as well, the most urgent subsequent step is the confirmation of some of the relationships found here on representative samples of Internet users.

As more of our interpersonal interactions take place over the Internet (with both positive and negative consequences), finding out what are the effects of online interactions are, and how these change with time (both for the human engaging and the technological platform), will be paramount for our understanding of human interactions in the 21st century.

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[6]We thank an anonymous reviewer for bringing this point to our attention.

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