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Online intergroup contact and intergroup attitudes:
A cross sectional and a longitudinal study of Greeks and Germans
interacting on Twitter and Facebook

The current study examined social networking sites, specifically Twitter and Facebook, as spaces for intergroup communication and contact between members of two national groups, Germans and Greeks, during the turbulent times of the Greek economic crisis. A cross-sectional study on Twitter and a longitudinal study on Facebook were conducted. We examined how social psychological variables (such as prior and extended contact, friendship, intergroup anxiety, national identification) and variables specific to the communication context (such as perceived quality of contact, vicarious contact quality, perceived anonymity, self-disclosure) relate to intergroup attitudes. Both social psychological and communication-relevant variables statistically significantly and independently predicted intergroup attitudes. Moreover, the longitudinal study showed that online contact improved intergroup attitudes and reduced intergroup anxiety. Findings suggest that intergroup contact via social networking sites can have positive effects on intergroup attitudes and that both social psychological and communication-related variables are important in understanding these effects.

Key words: intergroup contact, intergroup attitudes, social networking sites, Twitter, Facebook

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The rapid growth of social networking sites has led to their prevalence in the everyday life of millions of people all over the world. Users of the sites interact with other users they have never met before and may never see in person. These interactions, as most interactions that involve at least two individuals, are influenced by both the personal characteristics and the social categorizations of the interactants (Tajfel & Turner, 1979). People may communicate with people with whom they share a common identity and are perceived as an ingroup or with people that do not share a relevant identity and are thus perceived as an outgroup. Such intergroup communication can facilitate approach or avoidance between users with positive or negative consequences for their relations. Thus, communication over social networking sites can be seen as an important arena for intergroup contact and relations. Since their emergence, social networking sites have been described as spaces that could bring people together and create online communities (Boyd, 2010; Parks, 2010; Rheingold, 2000). At the same time, they have also been accused of enhancing stereotypes and polarization (Gallagher et al., 2021; Guess et al., 2018; Spears & Postmes, 2015). Either way, it seems that they provide an important space for intergroup communication and contact for people from all kinds of groups that is worth investigating.

The purpose of the current study was to explore whether intergroup contact via social networking sites like Twitter and Facebook affected intergroup attitudes and which are the variables that would predict these attitudes within this online context. To answer these questions, we conducted a cross-sectional study on Twitter and a longitudinal study on Facebook, focusing on the online interaction between Greek and German users of the platforms. The studies were conducted in a period when the relationships between the two countries were heightened due to the economic crisis in Greece (Sternberg et al., 2018; Tzogopoulos, 2015; Vasileiadis et al., 2020). Our purpose was to explore intergroup contact during a highly confrontational period in two of the media that people most often were using to express their views, frustration, and thoughts about each other and where contact between Greek and German nationals was an everyday occurrence. We focused on the interactions between Greek and German users in social networking sites during a period when the relationship between them was heightened due to the economic crisis. Specifically, from 2012 onwards, there was intense conflict between Greek and German nationals as the Greek people faced financial difficulties and the governments were called to take extra strong measures so that the Greek economy would not collapse whilst asking for economic help from the European Union. At the same time, Greeks were mostly pictured in foreign media as lazy and unable to repay the loans. As Germany had a central role in the discussions, for the Greek people, the Germans had the role of the enemy, an idea that was also perpetuated by the Greek media. We examined whether online contact between members of the two groups in an intergroup context such as this can provide a path for constructive interaction and an opportunity for improving intergroup attitudes which, at that time, were mainly determined by the traditional

media of each country that often depicted the outgroup in the most negative ways. We also examined how intergroup attitudes relate to social psychological variables known to predict intergroup attitudes in face-to-face contact contexts, but also to variables specific to the communication context of social networking sites. The current study addressed both external and internal validity concerns and contributes to the relevant literature in three ways: (a) by examining a real-life, socially significant, and particularly conflictual international context (b) of two social networking sites employing cross-sectional and longitudinal research designs and (c) of both social psychological and communication variables in the prediction of intergroup attitudes.

Online Intergroup Contact

According to social psychological theories of intergroup contact (Allport, 1954; Gudykunst, 1993; Hogg, 2000; Hogg & Vaughan, 2008; Pettigrew, 1998, 2021), face-to-face interactions between members from different groups can lead to a resolution or strengthening of their differences and their respective stereotypes for each other. For online intergroup contact, Amichai-Hamburger and McKenna (2006) suggest that the Internet created new spaces for interactions that enable the individuals to choose how they will express their personal and social identities, thus ultimately providing new spaces for intergroup communication. They add that the Internet's specific characteristics make it an ideal space for intergroup contact, which can lead to positive effects for intergroup attitudes. Everyone online is equal and can freely express their views and interact with anyone they want to, regardless of their social status in real life and from the safety of their own home or from wherever they choose to connect. Social media platforms provide their users with a sense of control of the contact. Therefore, according to Amichai-Hamburger and McKenna (2006), they could reduce the emergence of stereotypes in comparison to face-to-face contact, or any other more public communication form (such as a classroom presentation). Moreover, because users can interact with group members they would not usually encounter, they might be more open to these interactions (Amichai-Hamburger & McKenna, 2006). Harwood (2010) also proposes, in his theoretical approach of the contact space, that online interactions allow users more space and time to control their feelings and possible emotional outbursts. As he also mentioned more recently, the level of control the individual has over whether and in what way they will engage in the contact may affect their experience, as lower control may lead to negative contact experiences (Harwood, 2021). The fact that social networking sites users seem to have more control over their contacts and how they will present themselves and their views should make them feel much more comfortable during the contact, thus limiting their intergroup anxiety, which is evident in face-to-face contact and may limit any intergroup positive effects. The tendency for self-disclosure that seems to be high in social networking sites (Ben-Ze'ev, 2003; McKenna et

al., 2002; Nguyen et al., 2012; Reinecke & Trepte, 2008), along with the sense of anonymity they provide, are two extra characteristics of these platforms that could enable positive intergroup contact. These are enhanced by the fact that the users have complete control over how much they want to share about themselves, their appearance, and physical characteristics. It is also easy on most social networking sites to find people with common views and opinions. Furthermore, access to these platforms is very easy and they can be entertaining, so feelings such as anger, suspiciousness, or fear that can enhance prejudice are less frequent (Amichai-Hamburger, 2012; Amichai-Hamburger et al., 2015).

Most of the characteristics described above are related to the nature of social networking sites and, as is analyzed later, are important variables for our study. Despite the Internet's positive attributes, research (Bode, 2016; Gallagher et al., 2021; Reicher et al., 1995; Spears & Postmes, 2015; Postmes et al., 2002) has shown that online intergroup contact may lead to polarization, enhancement of stereotypes, withdrawal, and isolation from online conversations and even to offline violence between group members of opposing groups that already had engaged in online hostile interactions. Specifically, based on the social identity model of deindividuation effects (SIDE model, Postmes et al., 2002; Spears & Postmes, 2015), the depersonalisation effect of social networking sites may lead users that engage in intergroup contact to adopt the position of their ingroup, thus leading to more polarization, enhancement of stereotypes and negative intergroup attitude. These negative effects were evident in a recent study by Gallagher et al. (2021), who analyzed online conversations between members of protest groups from opposing political sides that were taking place on Facebook event pages for political protests and rallies in the United States and the United Kingdom, also examining how often physical violence was present during these protests and rallies. According to their findings, intergroup contact online could, in fact, lead to negative intergroup attitudes, as negative online interactions between members of opposing groups were linked to subsequent conflict offline (Gallagher et al., 2021). These findings seem to confirm Postmes et al. (2002), who suggested that during online intergroup contact, depersonalised communication can lead to enhanced differentiation between groups on many levels, from stereotypes to prejudice.

Social Psychological and Social Media-Related Variables

We assumed that both social psychological variables (such as intergroup anxiety, national identification, etc.) and variables specific to the communication context (such as perceived quality of contact and perceived sense of anonymity) would be related to intergroup attitudes. Extended social psychology research (Allport, 1954; Hewstone, 1996; Hewstone & Brown, 1986, 2005; Pettigrew, 1998) suggests that a number of variables can be important for intergroup contact. Relevant to our studies are various forms of prior contact, opportunity for contact, direct friendship, and extended contact (knowing that a friend has

an outgroup member friend, Wright et al., 1997) with outgroup members, all of which can be important predictors in the context of social networking sites (see Vezzali et al., 2014) and have positive effects on attitudes. Also, the degree of identification with social (or national) identities may also affect intergroup contact but in a negative way and enhance intergroup antagonism and conflict (Brown et al., 1999). Another variable that can undermine positive intergroup effects is intergroup anxiety. According to research (Brown & Hewstone, 2005; Hogg & Vaughan, 2008, Pettigrew & Tropp, 2006; Stephan & Stephan, 1984, 2001), intergroup anxiety arises from the belief of the participants that during the contact, they will experience emotions such as shame, rejection, discrimination, or misunderstandings. Consequently, intergroup anxiety is the result of the prediction that there will be negative effects during the intergroup contact.

Besides these variables which are known to be related to intergroup attitudes, we studied variables that are specific to these platforms and the communication context. One of them is the sense of anonymity that most of the social networking sites seem to offer. Even though the sense of anonymity could lead to positive intergroup contact for some (because they would feel more open and comfortable, Amichai-Hamburger & McKenna, 2006), for others, it could create a space where the individual differences are not salient, but group memberships are. This could affect how the individual perceives themselves both as an ingroup and outgroup member. According to Postmes et al. (2002), during intergroup contact and communication via the Internet, the deindividuation process could lead to enhanced differentiation between groups on many levels that relate to stereotypes and prejudice (Postmes et al, 2002; Postmes et al., 2001; Spears & Postmes, 2015). Another important variable examined in the current study concerns the perceived quality of contact that individuals have with outgroup members as well as the observation of other ingroup members having positive interactions with outgroup members (Amichai-Hamburger, 2012; Harwood, 2010, 2021). The more positively the intergroup contact is evaluated by the user the more positive effect it would have on intergroup attitudes. Moreover, the quality of contact could also be seen as a vicarious experience. That is, the observation of other ingroup members having positive interactions with outgroup members could also contribute to the formation of positive intergroup attitudes.

Another very important variable in the online context is self-disclosure, which is the voluntarily sharing of personal information with another person (Miller, 2002). Self-disclosure has been an important aspect of interpersonal relationships, but Turner et al. (2007) suggested that it can undermine prejudice during intergroup contact too. Self-disclosure can lead to a more positive evaluation of the outgroup by creating empathy and it can reduce prejudice by increasing the perceived importance of the friendship that exists between members of two different groups and by promoting mutual trust (Harwood et al., 2005; Miller, 2002; Turner et al., 2007). In the context of social networking sites, the fact that the individuals have control over the contact may enhance the tendency for self-

disclosure (Tidwell & Walther, 2002; Wilson et al., 2012), which, in turn, may lead to positive intergroup attitudes (Pettigrew, 1998; Turner et al., 2007). The structure of social networking sites itself encourages their users' self-disclosure by giving them control over how they choose to handle their public information (e.g., hide their date of birth, delete photos and personal information, control who has access to their profile etc., Walther, 2007; Wilson et al., 2012). As research suggests (Christofides et al., 2009), the disclosure of personal information is common practice for users of social networking sites, especially if they feel they share many common elements with certain users (see also McKenna et al, 2002; Nguyen et al., 2002; Reinecke & Treppe, 2008; Wilson et al, 2012). In fact, as Treppe and Reinecke (2013) highlighted, the more people engage with social media, the more likely they are to share information about themselves, which is beneficial for intergroup contact. Self-disclosure during intergroup contact is thought to undermine the negative effects of other variables, such as intergroup anxiety, and contribute to the development of positive intergroup attitudes (Dovidio et al, 2004; Harwood, 2010; Wilson et al., 2012).

The Current Study

In the current study, we examined several variables, such as prior contact, friendship, extended contact, intergroup anxiety, and national identification, which according to social psychology research (Allport, 1954; Brown & Hewstone, 2005; Gudykunst, 1993; Hogg, 2000; Hogg & Vaughan, 2008; Pettigrew, 1998; Vezzali et al, 2014), are related to intergroup attitudes. In order to examine the effects of intergroup contact on social networking sites, we also considered variables related to online contact: the sense of anonymity they provide to the users, the sense of control of the communication, the perceived quality of contact (Study 1), the tendency towards self-disclosure (Studies 1 and 2), and the vicarious contact quality (Study 2, Amichai-Hamburger, 2012; Harwood, 2010, 2021).

We conducted two studies, a cross-sectional study on Twitter and a longitudinal study on Facebook. These two media were chosen as they were the most popular during that period. We focused on the hashtag “#Griechenland” on Twitter (Study 1) and created a Facebook group (Study 2) to examine the interactions between Greek and German users of these media. In the Facebook study, we examined their intergroup attitudes, national identification, and intergroup anxiety on two time points, when they first became members of the group and when we had concluded the time the group would be active. For this study, we chose a longitudinal design, as longitudinal data provides more information regarding individual changes during a specific period. Among others, longitudinal data can provide evidence about the dynamic nature of social phenomena and highlight differences or changes between at least two time points (Menard, 2008; Ruspini, 2002). In intergroup contact research, even though there

is sparse longitudinal research data (Pettigrew & Tropp, 2006), those that do exist suggest that variables that affect intergroup contact and communication, such as prior contact or friendship with an outgroup member and self-disclosure, can lead to positive intergroup attitudes (Brown et al., 2007; Walther et al., 2014). It is also evident from the longitudinal study by Trepte and Reinecke (2013) that over time, the tendency for self-disclosure affects the use of social networking sites and vice versa. Surprisingly, there are no sociopsychological studies focusing on the relations between Greek and German people, especially taking into account that the relationship between the two nations has been historically intertwined in many ways (e.g., the monarchs in Greece came primarily from German and Austrian royal families).

In Study 1, the goal was to examine the social psychological and communication variables that predict intergroup attitudes of participants who were interacting online on Twitter. Based on the research presented earlier, we expected that social psychological variables, national identification, intergroup anxiety (negatively), and prior contact, extended contact, and friendship (positively) will be related to intergroup attitudes (H1). We also expected that communication variables, control, anonymity, quality of contact, and self-disclosure will be positively related with intergroup attitudes (H2). For the theoretical reasons presented earlier, we examined two separate hypotheses, one for the social psychological variables and one for the communication variables. We also explored the importance of communication variables as compared to the social psychological ones and examined whether communication variables would predict intergroup attitudes over and above the social psychological variables (RQ1).

In Study 2, the goals were to examine, as in Study 1, the variables that predict intergroup contact, but also to examine whether online intergroup contact over a period of one month in a Facebook group could affect intergroup relations. As it is described in the literature, measurement over a few weeks can be considered longitudinal (Ruspini, 2002). It is also important to note that during the period of one month, participants frequently exchanged opinions and views in the social media, having intense interactions with each other. In other words, the rich intergroup context of the study allowed for the development of dynamic changes in the variables under consideration. Thus, we examined whether contact over a period of one month affected the participants' intergroup attitudes, national identification, and intergroup anxiety, that is, whether there were differences between T1 and T2 measurements for these variables (RQ2). We also expected that prior and extended contact (T1), national identification, intergroup anxiety, vicarious contact quality, and self-disclosure (T2) would be related to intergroup attitudes (H3). Finally, we examined whether communication variables (vicarious contact quality and self-disclosure) would predict intergroup attitudes over and above social psychological variables (prior and extended contact, national identification, and intergroup anxiety; RQ3).

Study 1

Method

Sample and Context of the Study

A total of 164 individuals (76 Germans, 43 female, 36 male, age range: 18-51 years, $M_{\text{age}} = 29.56$, $SD = 7.71$; 88 Greeks, 45 female, 43 male, age range: 19-52 years, $M_{\text{age}} = 30.81$, $SD = 8.81$) participated voluntarily in the survey during June and July of 2012. Participants were self-identified Greeks and Germans and were recruited through the Internet via snowball sampling. We followed the hashtag #Griechenland and requested the Greek and German users that were posting under it to fill in an online questionnaire in their respective language. This hashtag became very popular in 2012 when discussions about the Greek debt started monopolizing the Greek and German media. Even though the hashtag is originally a German word, it was adopted by most users that wanted to express an opinion about the issue and the relationship between the two countries. For a period of over a month, we were posting the request to fill in our online questionnaire on Twitter using the hashtag. We did not make any posts related to the topic discussed, and only made posts related to our research (which were subsequently removed after the end of data collection).

Measures

Two versions of the questionnaire were developed, one in Greek and one in German, and distributed online. The German questionnaire was translated and back-translated.

Social Media Use. Participants were asked to indicate how often they used social media on a five-point scale, ranging from 1 (*rarely*) to 5 (*every day*), and how much time they spent online on a five-point scale, ranging from 1 (*less than an hour*) to 5 (*more than five hours*). A composite variable was calculated by averaging the means of the scales, $r = .43$, $p < .001$, $M = 3.52$, $SD = 1.19$.

Social Psychological Variables.

Prior Contact. Participants reported how many Germans or Greeks they were likely to meet in their daily lives within a month on a five-point scale, ranging from 1 (*none*) to 5 (*more than ten*).

Friends. Participants reported how many German or Greek friends they had on a same five-point scale.

Extended Contact. Participants reported on two questions how many friends their friends or their relatives had on the same scale (Turner et al., 2008; Wright et al, 1997). The average of the two questions was calculated.

National Identity. Three questions were used to measure national

identification (Brown et al., 1999: “I identify with other Germans/Greeks,” “It is important for me to be German/Greek,” “I am proud to be German/Greek”) on seven 7-point scales, ranging from 1 (*not at all*) to 7 (*very much so*). A principal component analysis revealed one factor (Cronbach’s $\alpha = .775$, eigenvalue = 2,10, explaining 70% of variance, all loadings $> .7$).

Intergroup Anxiety. Participants reported how they would feel if they were about to meet a member of the outgroup on five 7-point semantic differential scales (relaxed-nervous, acceptance-rejection, calm-unease, comfortable-awkward, trust-suspicion, Stephan & Stephan, 1985). A principal component analysis revealed one factor (Cronbach’s $\alpha = .801$, eigenvalue = 2,86, explaining 72% of variance, all loadings $> .7$).

Intergroup Attitudes. Seven 7-point semantic differential scales were used to measure intergroup attitudes (bad-good, unpleasant-pleasant, rude-polite, cunning-benevolent, stupid-smart, disgusting-lovable, lazy-hardworking, Amichai-Hamburger & McKenna, 2006; Pettigrew, 1998). A principal component analysis revealed one factor (Cronbach’s $\alpha = .937$, eigenvalue = 5,01, explaining 73% of variance, all loadings $> .7$).

Communication Variables.

Perceived Control in Social Media Use. Three items (following Postmes et al., 2001) measured participants’ perceived control when communicating on social media (e.g., “When you interact on social media do you feel that you can communicate easily?”) on seven 7-point scales, ranging from 1 (*not at all*) to 7 (*very much so*). A principal component analysis revealed one factor (Cronbach’s $\alpha = .757$, eigenvalue = 1,72, explaining 74% of variance, all loadings $> .7$).

Perceived Anonymity in Social Media Use. Three items (following Postmes et al., 2001) measured participants’ perceived anonymity when communicating on social media (e.g., “When you interact in the social media do you have a sense of anonymity?”) on seven 7-point scales, ranging from 1 (*not at all*) to 7 (*very much so*). A principal component analysis revealed one factor (Cronbach’s $\alpha = .823$, eigenvalue = 2,68, explaining 45% of variance, all loadings $> .7$).

Quality of Contact with Outgroup Members on Twitter. Participants evaluated the quality of contact they had with outgroup members on five 7-point semantic differential scales (typical- friendly, short-lasting, antagonistic-cooperative, negative-positive, unpleasant-pleasant, Ortiz & Harwood, 2007; Voci & Hewstone, 2003). A principal component analysis revealed one factor (Cronbach’s $\alpha = .902$, eigenvalue = 3,66, explaining 79% of variance, all loadings $> .7$).

Self-Disclosure in Twitter. Three questions measured participants’ inclination to disclose something about themselves while they were communicating with an outgroup member (“To what degree communicating in Twitter could made you disclose something personal / a secret / internal thoughts to a German/Greek interactant online?,” Christofides et al., 2009; Dovidio et al, 1997; Turner et al., 2007) on seven 7-point scales, ranging from 1 (*not at all*) to 7 (*very much*

so). A principal component analysis revealed one factor (Cronbach's $\alpha = .924$, eigenvalue = 2,62, explaining 87% of variance, all loadings > .8).

Analysis

Preliminary Analyses

Descriptive statistics showed that participants had moderately positive attitudes toward the outgroup ($M = 5.01$, $SD = 1.18$). There were no statistically significant differences between Germans and Greeks in their intergroup attitudes ($M = 5.10$, $SD = 1.20$ and $M = 4.93$, $SD = 1.16$, respectively), $t(162) = .928$, $p = .35$, or their intergroup anxiety ($M = 5.02$, $SD = 1.01$ and $M = 4.87$, $SD = 1.03$, respectively), $t(162) = .924$, $p = .36$. Thus, the rest of the analyses were conducted on all data combined. Correlations among the variables show that prior contact, friends, and extended contact had a positive, and intergroup anxiety and national identity had a negative relationship with attitudes. From the communication variables, quality of contact and self-disclosure had a positive relationship with intergroup attitudes. Apart from the intergroup attitudes, we also examined differences in intergroup anxiety as an important predictor of intergroup attitudes according to theory (see Stephan & Stephan, 1985).

Hierarchical Regressions

To examine the predictive power of the variables on intergroup attitudes, they were successively entered after demographic and social media use variables in a series of hierarchical regressions analyses (see Table 2). In the first step, control variables were entered, that is, gender, age and general social media use. In the second step, social psychological variables were entered, that is, prior contact, friends, extended contact, national identity, and intergroup anxiety. In the third step, communication variables were entered, that is, control, anonymity,

Table 1. Means, Standard Deviations and Intercorrelations Among Variables (Study 1)

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Intergroup attitudes	5,01	1.18										
2. Social media use	3.52	1.19	-.16*									
3. Prior contact	1.73	0.76	.41**	-.07								
4. Friends	1.82	0.80	.19*	.15	.52**							
5. Extended contact	2.23	0.70	.23**	.45**	-.11	.57**						
6. National identity	4.51	1.47	-.22**	.37**	-.03	.26**	.45**					
7. Intergroup anxiety	4.94	1.02	-.49**	.10	-.54**	-.46**	-.26**	.03				
8. Control	4.42	1.14	.01	.33**	-.03	.03	.36**	.30**	-.10			
9. Anonymity	2.84	1.18	-.04	-.36**	.34**	.13	-.25**	-.18**	-.20*	.24**		
10. Quality of contact	4.15	1.17	.34**	-.13	.69**	.44**	.22**	.20**	.27**	-.10	.32**	
11. Self-disclosure	2,46	1,48	.59**	-.38**	.64**	.46**	.13	-.19*	.38**	-.28**	.38**	.60**

* $p < .05$, ** $p < .01$.

Table 2. Summary of Hierarchical Regression Analysis for Variables Predicting Intergroup Attitudes ($N = 164$, Study 1)

Variable	β	Intergroup attitudes	
		Partial correlations	t
Step 1			
Gender	.18	.18	2.25*
Age	-.06	-.06	-0.74
Social media use	-.17	-.17	-2.22*
Step 2			
Gender	.02	.02	0.30
Age	-.06	-.07	0.88
Social media use	-.27	-.30	-3.98***
Prior contact	.28	.27	3.53***
Friends	-.31	-.27	-3.50**
Extended contact	.51	.43	5.88***
National identity	-.24	-.27	-3.42**
Intergroup anxiety	.37	.37	4.10***
Step 3			
Gender	.06	0.9	1.07
Age	-.05	-.07	-0.86
Social media use	-.09	-.11	-1.40
Prior contact	.13	-.11	1.34
Friends	-.15	-.14	-1.73
Extended contact	.02	-.02	-0.19
National identity	-.25	-.30	-3.86***
Intergroup anxiety	.24	.26	3.32***
Control	.47	.42	5.68***
Anonymity	-.49	-.42	-5.65***
Contact quality	.24	.22	2.83**
Self-disclosure	.72	.54	7.79***

Note. 1. 4-point scale 4, 2. list from 1 to 9. $R^2 = .06$ ($p < .01$) for Step 1; $R^2 = .46$ ($p < .01$) $\Delta R^2 = .40$ for Step 2 ($p < .001$). $R^2 = .64$ ($p < .01$) $\Delta R^2 = .18$ for Step 3 ($p < .001$).
 * $p < .05$, ** $p < .01$, *** $p < .001$.

contact quality, and self-disclosure.

Concerning intergroup attitudes, the analyses showed that national identity, intergroup anxiety, anonymity (negatively), control, contact quality, and self-disclosure (positively) were related to risk perceptions. All steps significantly added to the overall prediction. Collinearity diagnostics did not reveal any issues of collinearity, as all variance inflation factor (VIF) values were well below 10 and the tolerance statistics were all well above 0.2.

Study 2

Method

Sample and Context of the Study

A total of 72 individuals (24 Germans, 17 female, 7 male, age range: 18-51 years, $M_{\text{age}} = 30.12$, $SD = 7.72$; 48 Greeks, 39 female, 9 male, age range: 19-52 years, $M_{\text{age}} = 33.62$, $SD = 9.94$) participated voluntarily in the survey during May and June of 2015. For the purpose of the study, we created a Facebook group named "Thoughts & discussion on the Greek and German relations." To have as many Greek people as possible participating in the discussion, the chosen language of the group was English. Participants were self-identified Greeks and Germans and were recruited through the Internet via snowball sampling. Specifically, a few members were initially invited and they, in turn, invited more people to join the group and the discussion. For the creation of the group, we notified members of the public and students in universities in both countries and asked them to join and invite others. When entering the group, the members were notified about the study's purpose and were requested to fill in the initial questionnaire. The first stage, when people were able to join the group, lasted 15 days, after which no new members were accepted. Members of the group could communicate freely with each other and post whatever they wanted, engage in discussions in the comments section, and express their opinions. At the end of our research, after a month of interaction, the members of the group were asked to fill in the second questionnaire. After the completion of the study, the group was closed.

Measures at Time 1

Two versions of the questionnaire were developed, one in Greek and one in German, and distributed online. The same items used in Study 1 were used in Study 2. The results of exploratory factor analyses (PCA), which confirmed the same factorial structure as in Study 1, and internal consistency data are reported below.

Perceived Control in Social Media Use. Cronbach's $\alpha = .860$, one factor, eigenvalue = 3.39, explaining 40% of variance, all loadings $> .7$.

National Identity. Cronbach's $\alpha = .839$, one factor, eigenvalue = 2.28, explaining 76% of variance, all loadings $> .7$.

Intergroup Anxiety. Cronbach's $\alpha = .727$, one factor, eigenvalue = 2.83, explaining 69% of variance, all loadings $> .7$.

Prior Contact, Extended Contact. The same scales were used as in Study 1 (prior contact, $r = 0.259$, $p < .01$, extended contact, $r = 0.555$, $p < .001$).

Intergroup Attitudes. Cronbach's $\alpha = .926$, one factor, eigenvalue = 4.89, explaining 91% of variance, all loadings $> .7$.

Measures at Time 2

Perceived Control in Social Media Use. Cronbach's $\alpha = .996$, one factor, eigenvalue = 3.99, explaining 57% of variance, all loadings $> .7$.

National Identity. Cronbach's $\alpha = .858$, one factor, eigenvalue = 2.34, explaining 78% of variance, all loadings $> .7$.

Intergroup Anxiety. Cronbach's $\alpha = .771$, one factor, eigenvalue = 2.68, explaining 71% of variance, all loadings $> .6$.

Prior Contact, Extended Contact. The same scales were used as in Study 1 (prior contact, $r = 0.259$, $p < .01$, extended contact, $r = 0.555$, $p < .001$).

Intergroup Attitudes. Cronbach's $\alpha = .860$, one factor, eigenvalue = 3.95, explaining 73% of variance, all loadings $> .7$.

Vicarious Contact Quality. Participants were asked to evaluate the contact they saw that other member of their ethnic group had during the interaction with outgroup members in the Facebook group on four questions: "Do you observe other Germans/Greeks to have positive/friendly/cooperative/essential contact with Greek/German users?" on a seven-point scale ranging from 1 (*not at all*) to 7 (*very much so*). A PCA revealed one factor (Cronbach's $\alpha = .712$, eigenvalue = 2.20, explaining 68% of variance, all loadings $> .6$).

Self-Disclosure. Cronbach's $\alpha = .845$, one factor, eigenvalue = 2.47, explaining 82% of variance, all loadings $> .8$.

Analysis

Preliminary Analyses

In order to test the effect of national group (Germans, Greeks) and time on intergroup attitudes a 2×2 mixed analysis of variance (ANOVA) design was employed (see Table 3). Results indicated a statistically significant main effect of intergroup attitudes, $F(1, 70) = 6.25$, $p = .01$, $\eta_p^2 = .08$, qualified by a statistically significant interaction between national group and intergroup attitudes, $F(1, 70) = 8.45$, $p = .005$, $\eta_p^2 = .11$. While there was no statistical difference between pre- and post-intergroup attitudes for Greeks ($M = 4.63$, $SD = 1.06$, and $M = 4.56$, $SD = 0.80$, respectively), $F(1, 42) = .14$, $p = .71$, there was a statistically significant difference for Germans ($M = 4.67$, $SD = 1.42$ and $M = 5.54$, $SD = 0.70$, respectively), $F(1, 24) = 9.07$, $p = .006$. For intergroup anxiety data, a main effect for time was evident, $F(1, 70) = 5.14$, $p = .03$, $\eta_p^2 = .07$, with results in Time 1 being smaller than in Time 2 ($M = 4.63$, $SD = 1.18$ and $M = 5.37$, $SD = 0.79$, respectively). A similar pattern was evident for national identity data as well, $F(1, 70) = 7.84$, $p = .001$, $\eta_p^2 = .10$, with results in Time 1 being smaller than in Time 2 ($M = 3.92$, $SD = 1.51$ and $M = 4.38$, $SD = 1.56$, respectively).

Table 3. Means, Standard Deviations of Variables (Study 2, Time 1 and 2)

	Germans (n = 24)				Greeks (n = 48)			
	Time 1		Time 2		Time 1		Time 2	
	M	SD	M	SD	M	SD	M	SD
1. Intergroup attitudes	4.67 ^a	1.42	5.53 ^b	0.89	4.63 ^a	1.07	4.57 ^a	0.79
2. National identity	3.55	1.71	4.36	1.33	4.09	1.39	4.39	1.71
3. Intergroup anxiety	4.69	1.46	5.53	0.65	4.60	1.04	5.29	0.92
4. Prior contact	2.91	1.01			2.36	1.21		
5. Extended contact	2.43	1.07			2.85	0.96		
6. Vicarious contact			4.44	0.52			4.75	0.91
7. Self-disclosure			3.15	1.47			2.70	1.39

Note. Comparisons were performed within each national group. Different subscripts indicate significant differences between means.

Greeks: $R^2 = .10$ ($p > .05$) for Step 1; $R^2 = .23$ ($p < .01$) $\Delta R^2 = .15$ for Step 2 ($p < .01$). $R^2 = .36$ ($p < .01$) $\Delta R^2 = .13$ for Step 3 ($p < .01$).

Germans: $R^2 = .00$ ($p > .05$) for Step 1; $\Delta R^2 = .68$ for Step 2 ($p < .001$). $R^2 = .82$ ($p < .01$) $\Delta R^2 = .13$ for Step 3 ($p < .01$).

Table 4. Summary of Bootstrapped Hierarchical Regression Analyses for Variables Predicting Intergroup Attitudes for Germans and Greeks (N = 72)

	Greeks (n = 48)			Germans (n = 24)		
	BCa 95% CI			BCa 95% CI		
	B	LL	UL	B	LL	UL
Step 1						
Prior contact T1	.13	-.089	.398	.05	-.212	.357
Extended contact T1	.14	-.172	.383	-.00	-.369	.281
Step 2						
Prior contact T1	.08	-.138	.325	-.11	-.274	.083
Extended contact T1	.17	-.122	.407	-.10	-.305	.057
National identity T2	-.15*	.078	.450	-.37***	-.509	-.256
Intergroup anxiety T2	.27**	-.254	-.057	.97**	.556	1.414
Step 3						
Prior contact T1	.08	-.098	.338	.05	-.142	.243
Extended contact T1	.15	-.138	.377	-.12	-.322	.069
National identity T2	-.16*	-.279	-.015	-.35***	-.472	-.250
Intergroup anxiety T2	.45***	.236	.655	.96***	.637	1.329
Vicarious contact T2	.06	-.183	.259	-.61*	-1.017	-.159
Self-disclosure T2	-.26*	-.434	.033	.12	-.004	.251

Note. Greeks: $R^2 = .10$ ($p > .05$) for Step 1; $R^2 = .23$ ($p < .01$) $\Delta R^2 = .15$ for Step 2 ($p < .01$). $R^2 = .36$ ($p < .01$) $\Delta R^2 = .13$ for Step 3 ($p < .01$). Germans: $R^2 = .00$ ($p > .05$) for Step 1; $\Delta R^2 = .68$ for Step 2 ($p < .001$). $R^2 = .82$ ($p < .01$) $\Delta R^2 = .13$ for Step 3 ($p < .01$).

Bootstrap results are based on 2000 bootstrap samples. Bias corrected accelerated 95% confidence intervals Bootstrapped p values * $p < .05$, ** $p < .01$, *** $p < .001$,

Hierarchical Regressions

To examine the predictive power of the variables on intergroup attitudes, they were successively entered into a series of bootstrapped (because of the low sample numbers) hierarchical regression analyses (see Table 2), separately for Greeks and Germans since they reported different intergroup attitudes after their contact online. In the first step, prior and extended contact at Time 1 were entered. In the second step, national identity and intergroup anxiety at Time 2 were entered. In the third step, vicarious contact quality, and self-disclosure at Time 2 were entered.

The analyses showed that national identity and intergroup anxiety were statistically significant predictors of intergroup attitudes for both national groups. For Germans who reported improved intergroup attitudes after online contact, the vicarious contact quality was a statistically significant predictor among the communication variables. All steps significantly added to the overall prediction for both national groups, although for Greeks, self-disclosure's confidence intervals included zero, meaning that this is not considered a statistically significant finding.

Discussion

We wanted to examine the interaction over social networking sites as an arena for intergroup contact and communication in a cross-sectional and a longitudinal study. The goal was to test the effects of online intergroup contact between German and Greek users on their intergroup attitudes, anxiety, and identification. Another major goal was to consider the relationships between social psychological and communication-related variables and intergroup attitudes. Overall, both studies confirmed the importance of both social psychological and communication-related variables in predicting intergroup attitudes. Significantly, communication variables independently predicted intergroup attitudes. Moreover, in Study 2, online contact on Facebook was beneficial for intergroup attitudes (albeit only for German users) and intergroup anxiety, providing support to the idea that online intergroup contact could have positive effects for intergroup relations.

Concerning the social psychological variables, in both studies, as expected, both intergroup anxiety (Brown & Hewstone, 2005; Hogg & Vaughan, 2008, Pettigrew & Tropp, 2006; Stephan & Stephan, 1984) and identification with national identity were negatively related with intergroup attitudes (Brown et al., 1999). The more participants were anxious about potential contact with members of the outgroup and the more they identified with their national ingroup, the less positive attitudes they had towards the outgroup. These findings confirm the importance of the social psychological processes for both face-to-face and online intergroup contact.

Interestingly, communication variables predicted intergroup attitudes over and above social psychological variables, suggesting that individuals' perceptions of the communication context are also important for intergroup relations. Social

networking sites' characteristics can provide a supportive context for intergroup contact, as the users can interact from the safety of their own space and take their time to respond something, which could limit their intergroup anxiety and enhance the overall control they have over the interaction (Amichai-Hamburger, 2012; Amichai-Hamburger & McKenna, 2006; Harwood, 2010). Also, as Vezali et al. (2014) suggest, social networking sites and the intricate relationships that can be developed between users and their respective social networks could enhance the positive effects of indirect and extended contact.

The sense of anonymity on the social networking sites seems possible to relate to both positive and negative attitudes. Specifically, according to researchers (Amichai-Hamburger & McKenna, 2006; Carr et al., 2016) it can have positive effects on intergroup attitudes, as the users feel comfortable in being honest and open to different opinions and can take their time to process their thoughts before responding. On the other hand, other studies based on the SIDE model (Postmes et al., 2002; Spears & Postmes, 2015) suggest that the anonymity of social networking sites may lead users to pay attention to the salient ingroup norms, thus leading to more polarization, stereotyping, and negative intergroup attitudes. In Study 1, anonymity was negatively related to intergroup attitudes. This finding seems to suggest that, in the present, highly conflictual and salient intergroup context, the more participants felt that they were anonymous while using the media to communicate with members of the outgroup, the more they followed perceived ingroup norms and stereotypical thinking and were less likely to improve their intergroup attitudes.

We also found that other variables related to the unique nature of the media, such as control of intergroup communication and contact quality positively predicted intergroup attitudes, as expected based on the relevant research (Amichai-Hamburger, 2012; Harwood, 2010). These findings support the idea that perceived control of communication over the social networking sites helps individuals navigate more easily and efficiently among their relationships online. Also, the more pleased the users were from their personal online interaction, the more positive attitudes they formed towards the outgroup. Furthermore, we found that the tendency for self-disclosure was related to positive intergroup attitudes, confirming previous similar findings (Brown et al., 2007; Trepte & Reinecke, 2013; Walther et al., 2014).

Following Study 1 on Twitter, we decided to examine intergroup contact on another popular social networking site, Facebook. First, we wanted to test whether the same pattern of relationships among social psychological, communication-related variables, and intergroup attitudes would still occur on another platform. Second, we wanted to examine whether the experience of online intergroup contact could have an effect on intergroup attitudes, and thus followed a longitudinal design. Intergroup attitudes, intergroup anxiety, and national identification were tested before participants joined the Facebook group and after it has been closed. Aside from the meta-analysis by Pettigrew

and Tropp, (2006), there are few of longitudinal studies that examine intergroup contact. Wölfer et al. (2015) also acknowledge the need for longitudinal studies in the field of social network analysis and suggest two waves of measurement. Trepte and Reinecke (2013) followed a longitudinal design to examine use of social networking sites and self-disclosure from a communication theoretical approach. To our knowledge, our study is the first longitudinal study examining intergroup contact on Facebook.

Our analyses showed that online contact led to improved intergroup attitudes for German participants only. At the same time, online contact led to greater national identification for both groups, meaning that national identity was highly salient during the one-month online contact on Facebook. This suggests that the online contact was truly intergroup. It also led to decreased intergroup anxiety for both groups, meaning that the experience of actual online contact reduced the anxiety the participants thought they would feel in the prospect of future contact. Generally, findings supported the idea that online contact can have positive effects on intergroup relations (on intergroup anxiety in both groups and on intergroup attitudes in German users only. For Greek participants, no improvement in intergroup attitudes was observed, which can be attributed to the general context of that period. During that time, Greece was going through a polarized referendum, intense talks with the European Union about the Greek debt were taking place, banks were closing for days, and a general negative public opinion for many European countries, mostly those in the North and especially Germany, was present (Sternberg et al., 2018; Tzogopoulos, 2015; Vasileiadis et al., 2020). Furthermore, for both national groups, as we also found in Study 1 and as expected based on relevant theory, national identification and intergroup anxiety negatively predicted intergroup attitudes (Brown & Hewstone, 2005; Brown et al., 1999; Hogg & Vaughan, 2008, Pettigrew & Tropp, 2006; Stephan & Stephan, 1984). This confirms the importance of these two social psychological processes for intergroup attitudes in this online intergroup context. As it is evident from both studies, our findings support Brown and Hewstone's (2005) model, as both intergroup anxiety and national identity predicted intergroup attitudes on both Twitter and Facebook.

Interestingly, while self-disclosure did not predict intergroup attitudes, the communication variable that independently predicted intergroup attitudes for German participants was vicarious contact quality. This suggests that participants' intergroup attitudes improved when they observed other members of their ingroup having efficient and successful communication and contact with members of the outgroup. We could argue that such vicarious experiences help individuals learn how to have similar beneficial experiences themselves. For example, people may learn that other ingroup members have outgroup members as friends (extended contact) and this has a positive relation on their intergroup attitudes. Learning that other ingroup members have positive online intergroup contact with outgroup members similarly has positive effects on intergroup attitudes.

The current studies had certain limitations. The snowball sampling that was employed in the present studies makes generalization difficult. Another problem was the small sample in Study 2 which was compensated for with bootstrapped regressions. Future research should verify this pattern of results with different groups and under different conditions. Social networking sites are constantly changing and evolving, but most of their users agree on the fact that they see themselves as participants (or sometimes only viewers) in online communities. To have more information and data for intergroup contact within these contexts, we need to examine mediated contact between more groups online, both national (such as Ukrainian/Polish and Russian citizens) and political (pro-choice and pro-life group members, individuals for and against vaccinations). Besides this study, Gallagher et al. (2021) provides another approach to future research. It would be also interesting to examine more generally the concept of media affordances, the different opportunities for contact that different media allow the interactants (Harwood, 2021).

At the same time, it would be interesting to examine the current relationship between Greek and German social networking site users. The relationship between the two countries' governments has been much more stable and less confrontational the last few years. Therefore, the online tension has also subsided. This fact, the pandemic, and the war in Ukraine seem to have shifted the focus to other issues that monopolize the users' online interest, so the re-examination of the Greek-German intergroup context within this new international context would likely produce different results.

In conclusion, findings from both studies highlight the importance of online intergroup contact and communication for intergroup attitudes. Either directly, by improving intergroup attitudes and minimizing intergroup anxiety (Study 2), or indirectly, by the perceptions users have of the communication context within which they interact (Study 1 and 2), online contact is important for intergroup relations. The current studies contribute to the understanding of intergroup contact in a media-saturated world by examining two popular social networking sites during a period of intense intergroup context. By employing cross-sectional and longitudinal designs, we also contribute to a more complete and valid understanding of online intergroup contact and communication.

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Conflict of Interest Disclosure

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Research Ethics Statement

The study followed the ethical guidelines of the Authors' local Psychological Society (that follow those of their UK counterpart). Participants were clearly notified before filling in the questionnaires and had the option to respond anonymously.

Authorship Details

Eleni Kioumi: research concept and design, collection and/or assembly of data, data analysis and interpretation, writing the article, final approval of the article.

Antonis Gardikiotis: data analysis and interpretation, critical revision of the article.

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