Article

Does Rejection Still Hurt? Examining the Effects of Network Attention and Exposure to Online Social Exclusion

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Abstract

Social media platforms archive the content and flow of social exchange across communication networks. This may present challenges for individuals because using these platforms increases the probability of observing exchanges among their friends in which they were unintentionally excluded. This study randomly assigned 194 participants to conditions where they were presented with written scenarios describing hypothetical online conversations between their close friends in which they were excluded or included. Results suggest that participants in the excluded condition experienced the most negative and least positive emotional responses. Further, participants with the tendency to devote cognitive resources to understanding their social networks—a construct we call network attention—were particularly sensitive to the stimuli. Network attention predicted negative emotional responses in the excluded condition and positive emotional responses in the included condition. Results are discussed in the context of communication and cognition via social media.

Keywords

CMC, social media, social exclusion, emotion

New media, like social network sites (SNSs), raise important questions regarding the effects of the integration of interpersonal and mass communication has on our relationships (Walther, 2017). Traditional social exchange is directed and personal, and we typically do not have access to records of these conversations (e.g., telephone, face-to-face conversations). However, SNSs provide individuals access to transcripts of social exchange between one's friends, which are visible and often pushed to others in these networks.

We conceptualize the structure and content of communication flow across our social networks as signals individuals use to help determine their standing within their social network. For example, SNSs expose users to information about *their friends*' communication—who is talking to whom, how often, and what they are saying—and this information is made even more salient when it is

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pushed to mobile communication devices. Evidence suggests that individuals detect and automatically respond to social exclusion to prevent consequences of actual exclusion (Williams & Zadro, 2005). Therefore, our primary goal is to gage individuals' emotional responses to social exclusion online. However, given the volume of social interactions online today, it is unclear how closely users attend to this information.

Research suggests individuals differ systematically in terms of how much attention they dedicate to their social environment and how in tune they are to the communicative behavior around them. Badawy, Stefanone, and Brouer (2014) developed and tested a measure of network attention which assesses individuals' tendencies to focus on and evaluate their social network structure and the communicative dynamics among others in that social circle. We examine how the tendency to think about social network structure and dynamics affects emotional responses to social exclusion.

We aim to test the boundaries of and extend social exclusion research by examining how SNS users respond to hypothetical instances of social exclusion online, and how these emotional responses vary systematically with network attention. The literature review is structured as follows. First, we review the fundamentals of social exclusion. Next, the literature examining social exclusion online and network attention are discussed followed by a description of the study itself.

Social Exclusion

Baumeister and Leary (1995) theorized that forming relationships is a fundamental motivation of human behavior also known as the need to belong. Because belongingness is fulfilled through affiliation with and acceptance from others, individuals must devote cognitive resources towards understanding and negotiating interpersonal interactions and relationships. Individuals unable to satisfy the need to belong suffer both psychologically and physically.

Humans' drive to form and maintain relationships is a function of survival (e.g., Buss & Kenrick, 1998). Cooperative groups provide their members access to shared resources like food and protection, which are difficult to obtain when living in isolation. Group membership leads to competitive advantage because individuals in groups are more likely to survive and reproduce than those living in solitary. Thus, individuals are motivated to behave in ways that lead others to accept them as relational partners and group members.

However, groups must be strategic when granting membership. Research suggests that individuals selectively exclude others because of limited time, energy, and other resources (see Leary & Cottrell, 2013, for review). Further, groups tend to exclude others who violate norms and exploit relationships because they generate more costs to the group than benefits.

Because group membership correlates with survival, individuals have developed counteradaptations to minimize one's likelihood of exclusion. Several scholars have theorized about how individuals monitor their social environment for acceptance and rejection cues (e.g., Gardner, Pickett, & Brewer, 2000). For example, Gardner, Pickett, and Brewer (2000) proposed a model of belonging regulation, which suggests that threats to belongingness activate the social monitoring system (SMS). When activated, the SMS monitors one's environment for social cues that individuals can use to avoid rejection and gain inclusion. Research suggests that individuals quickly respond to neutral reactions, minor snubs, and trivial exclusions as if they had tremendous consequences, even when social exclusion originates from others whose acceptance does not matter (Gonsalkorale & Williams, 2007).

Baumeister and Leary (1995) argued that because belongingness is a fundamental human need, threats to belonging affect cognition and behavior. For example, research suggests that individuals not fulfilling their need to belong or who are excluded from others whom they have no relationship with have better memory for social interactions and are better at identifying emotions and understanding others' thoughts and feelings (Gardner, Pickett, Jefferis, & Knowles, 2005; Pickett,

Gardner, & Knowles, 2004). Further, social exclusion evokes neural activity similar to when feeling physical pain (Eisenberger, Lieberman, & Williams, 2003) and leads to increased consumption of unhealthy foods (Baumeister, DeWall, Ciarocco, & Twenge, 2005), and suicidal behavior (Van Orden et al., 2010). Although these relationships are robust, research on emotional responses to exclusion is less clear.

For example, some evidence suggests social exclusion is associated with higher levels of negative affect (Blackhart, Eckel, & Tice, 2007; Murray, Derrick, Leder, & Holmes, 2008) and lower levels of positive mood (i.e., Mendes, Major, McCoy, & Blascovich, 2008; van Beest & Williams, 2006). Research assessing affective reactions to social exclusion finds little or no differences in emotions between individuals with a threatened need to belong and those without such threats (i.e., DeWall & Baumeister, 2006). Further, research suggests that emotional responses inconsistently emerge as a mediator when examining social exclusion and behavioral outcomes (e.g., Baumeister, Twenge, & Nuss, 2002; Twenge, Baumeister, Tice, & Stucke, 2001).

To help understand emotional responses to social exclusion, Blackhart and colleagues (2009) analyzed 192 studies and concluded that rejected individuals feel worse than those who are in accepted or neutral (control) conditions. Because research uses different measures for affective states (e.g., bipolar scales, separate positive and negative affect scales, and single item measures), an absolute measure of affect and emotion was calculated to compare findings. Surprisingly, findings revealed that individuals have neutral or slightly positive emotional responses to exclusion. Therefore, Blackhart, Nelson, Knowles, and Baumeister (2009) concluded that excluded individuals often feel worse than those included, but not necessarily bad. Further, Blackhart et al.'s (2009) meta-analysis found the largest effects when participants *imagined* being rejected from a group, rather than actually experiencing exclusion from others in which participants have no actual relationships with (e.g., Pickett et al., 2004; Williams & Sommer, 1997) or when they are asked to recall past experiences with social exclusion (e.g., Smith & Willams, 2004).

To begin understanding reactions to social exclusion online, we propose examining emotional responses to hypothetical, realistic manipulations of exclusion occurring on social media. Given the popularity of communicating via SNSs, users have access to transcripts of conversations between their friends. Naturally, we are not actively involved in many of our friend's conversations, but SNSs functionally enable awareness of these conversations which may be linked to perceptions of exclusion online.

Social Exclusion Online

Unmediated conversations are generally private so only those directly involved have access to the information exchanged. Pre-Internet, social exclusion occurred either through real-time conversations where someone was left out or by talking to others and learning about having been excluded. However, given the proliferation of social media, this is no longer the case.

Walther (2017) suggests that new media such as SNSs provide challenges for researchers because they meld interpersonal and mass communication processes. To further build theory, research must take into consideration the metaconstructs at play when investigating the effects of new media. Some factors to take into consideration when examining online social exclusion is distribution capacity and message persistence. Walther (2017) suggests that social media has a high distribution capacity such that it allows individuals to disseminate information to large groups of people. Messages transmitted between social media users are generally public. Further, message persistence suggests that social media has the ability to store and retrieve information through various functions such as online profiles and comments. Conversations on SNSs are stored so that users can seek out past exchanges.

In regard to their high distribution capacity and message persistence, SNSs increase individuals' perception of social exclusion because these platforms enable access to transcripts of conversations between one's friends. Users can communicate all kinds of information with each other by writing on profile pages or tagging each other in written posts. Conversations also emerge around shared content like digital images. In addition, users are often pushed transcripts of these conversations via notifications on smartphones and other communication devices. SNS-mediated communication is archived so users can find past exchanges and see who was talking to who, how often, and what they were talking about. Together, SNSs' high distribution capacity and message persistence increase the probability in which users encounter social exclusion online.

Oftentimes, social exclusion online is unintentional and not meant to cause harm to those excluded from exchanges. For example, when Frank logs into Facebook, he likely sees records of his friends conversing about their lives or making plans to hang out in the future. Further, he can also learn which of his friends are spending time together when those friends "check-in" to locations and events, or when his friends share images of themselves together. Although these friends did not have malicious intent when they shared this content, Frank may interpret and respond to these signals as social exclusion, consistent with belonging regulation (Gardner, Pickett, & Brewer, 2000).

Research has explored the effects of social exclusion online, oftentimes referred to as cyberostracism. The most common method of examining cyberostracism is using Williams and colleagues' (2000) Cyberball paradigm. Cyberball is an online ball tossing game where participants believe they are playing with two other individuals also recruited for the study. Participants can either experience inclusion in or exclusion from the game. Hartgerink and colleagues' (2015) meta-analysis found that cyberostracism using Cyberball consistently produced lower positive higher negative mood. Additionally, this method was found to threaten individuals' basic needs (e.g., need to belong). Although this research provides insight into the effects of online social exclusion, these findings may not be generalizable to SNSs considering that rejection typically occurs from small groups in which the participants have no relationship with.

Wolf et al. (2015) designed a paradigm called ostracism online to examine social exclusion on social media. Ostracism Online allows researchers to manipulate different aspects of social settings online (e.g., comments, likes) while maintaining high experimental control. Schneider and colleagues (2017) used Ostracism Online to examine the effects that online social exclusion has on one's emotional states, belonging, self-esteem, control, and meaningful existence. Results suggest that individuals in the social exclusion condition experienced decrements in their emotional state, belongingness, self-esteem, and a meaningful existence. Although Ostracism Online is beneficial when examining social exclusion online, it fails to provide a realistic manipulation of social exclusion from one's actual group of friends, in front of their self-constructed audience.

Other research on SNSs points to negative intrapersonal consequences from using these sites. Bevan, Pfyl, and Barclay (2012) found that after being unfriended on Facebook, individuals respond with rumination and negative emotions such as anger, frustration, and depression. Sagioglou and Greitemeyer (2014) found that time spent on Facebook is correlated with negative mood. Greitemeyer, Mugge, and Bollermann (2014) suggest that interpersonal neglect such as having unresponsive friends on SNSs threatens fundamental human needs including the need to belong and self-esteem. Additionally, Schneider and colleagues (2017) found that drawing from these studies and the research on social exclusion off-line, exposure to more authentic online exclusion signals should elicit similar emotional responses. Thus, we hypothesize:

Hypothesis 1a: Participants who encounter social exclusion on SNSs will experience stronger negative emotional responses than those who experience social inclusion.

Hypothesis 1b: Participants who encounter social inclusion on SNSs will experience stronger positive emotional responses than those who experience social exclusion.

Sex Differences

Canary and Hause's (1993) meta-analysis suggests that individuals' sex or gender has minimal predictive power when examining human behavior. However, when considering the effects of social exclusion sex may explain additional variance in emotional responses to online rejection. Research suggests that men tend to interact in larger, more interconnected groups that are comprised of same-sex peers and women prefer isolated one-on-one interactions (Markovits, Benenson, & Dolenszky, 2001). From an evolutionary perspective, it is beneficial to have a large tribe of males when competing for resources with other groups. Therefore, males are less likely than females to utilize social exclusion as punishment because it produces more costs than benefits to the group's overall health. Instead, males prefer to compete for dominance while maintaining a large group. However, it is more strategic for females to employ social exclusion as it eliminates competition within the group for access to resources.

Through a series of experiments, Benenson and colleagues (2013) provide evidence for this model suggesting that females are more sensitive to social exclusion than males. Specifically, they found that females are more likely than males to exclude others. Additionally, they found that females are more likely than males to report incidents of social exclusion and are quicker at identifying social exclusion signals. Finally, Benenson et al. (2013) found that when experiencing social exclusion, females' heart rate increased more than males.

Although off-line research suggests that women detect and respond to social exclusion cues quicker than men (Benenson et al., 2013), sex differences likely persist regardless of the communication medium. Barak and Gluck-Ofri (2007) found that females were more reciprocal online, and Jang and Stefanone (2011) found that female bloggers were more likely to expect acknowledgment of their blog posts, which is a form of reciprocal communication. Further, Boneva and Kraut (2002) suggested that women are more likely than men to use communication technology as tools for relational maintenance. Although these findings do not provide direct evidence in SNS-mediated contexts, we speculate that females are more likely to prescribe to and be sensitive to social exclusion online than males. Thus, we hypothesize that,

Hypothesis 2: The effects hypothesized in Hypothesis 1 will be stronger for female than male participants.

Network Attention

Recall that humans have the ability to detect social exclusion signals (Williams & Zadro, 2005). One trait describing variations in this ability is network attention. Specifically, network attention assesses "the extent to which individuals understand the structure of interpersonal relationships comprising their online social networks" (Badawy, Stefanone, & Brouer, 2014, p. 1569), although Badawy et al. originally refer to this concept as awareness. Specifically, network attentive individuals demonstrate knowledge of *who knows whom* in their network and specific characteristics of their interpersonal communication such as the structure and equity statuses of their friends' friends. Further, Badawy et al. (2014) suggests that network attention is associated with investment of cognitive resources towards understanding one's social environment. Although these authors focus on "online" networks, the measure actually addresses one's tendency to invest

cognitive resources with the goal of understanding the structure, history, and balance of all interpersonal relationships surrounding them.

Additional support for the network attention construct is found in Stefanone, Iacobucci, and Svetieva (2016) who conducted an experiment evaluating whether individuals scoring high on this measure are more likely to attend to, process, and understand the social structure of groups of strangers whose interactions are presented in real time. The experiment used 4-min video clips of varying social complexity as stimuli, and the authors found a significant positive relationship between network attention and understanding of these character's past, current, and future relationships. Additionally, network attentive participants expressed more confidence in their responses. Results from this study suggest that network attention correlates with understanding novel social network structures, which may aid individuals in detecting and responding to social exclusion signals in their own environment. Further, this finding suggests that network attentive individuals devote more cognitive resources to understanding their interpersonal relationships than the inattentive, such that they process this social information more deliberately and thoughtfully.

Petty and Cacioppo (1981) propose the elaboration likelihood model (ELM) which suggests that there are two information-processing routes: central and peripheral. The central processing route involves high message elaboration in which individuals devote cognitive resources to evaluating information in messages. Central processing occurs when individuals are both motivated and have the ability to think about the message. Therefore, message processing occurs in a deliberate, thoughtful, and effortful manner. In contrast, peripheral processing occurs when individuals rely on heuristics or cues to process messages instead of engaging in high message elaboration. When individuals do not have the ability to think about messages, quick, relatively superficial, and low-effort processing occurs.

The ELM has been applied to studies examining persuasion and attitude change in the context of health (Kreuter & Wray, 2003), consumer behaviors (Petty, Cacioppo, & Schumann, 1983), and media effects (Petty, Priester, & Brinol, 2009). Although to our knowledge no research has applied this model to social information processing online, it is likely that certain individuals, like those who are network attentive, are more likely to engage in high message elaboration in the context of social exchange.

Because evidence suggests that network attentive individuals are more motivated and better equipped to understand their social spheres, it is likely that these individuals often process social information centrally. Thus, network attention should be associated with accurately attending to, understanding, and responding to social exclusion signals. When network attentive individuals encounter situations where they were excluded from interactions—like their friends conversing without them on SNSs about situations where they are typically included—they should be more likely to process this information as exclusion, and therefore experience stronger negative emotional responses than those inattentive.

This study employs scenarios depicting situations where participants are excluded from or are included in an online conversation between their close friends. We suspect that because those high in network attention devote cognitive effort toward understanding these social exclusion signals, they will experience stronger negative emotional responses when excluded from the interaction and stronger positive emotional responses when included. Thus, we hypothesize that,

> **Hypothesis 3a**: Network attention is associated with experiencing negative emotional responses when encountering social exclusion online.
>
> **Hypothesis 3b**: Network attention is associated with experiencing positive emotional responses when encountering social inclusion online

Method

Participants and Procedure

In the spring semester of 2014, a total of 194 active Facebook users (94 female) from an undergraduate communication class in large northeastern university in the United States completed the experiment in exchange for 1 hr of research credit, and all procedures were approved by the institutional review board. Undergraduate students were an ideal sample for this study as research indicates that individuals between the ages of 18 and 29 are heavy users of SNSs (Greenwood, Perrin, & Duggan, 2016). After arriving in the lab and consenting, participants were directed to a website to complete the experiment and related survey items. Participants averaged 21.66 years of age ($SD = 3.56$) and were 60.3% Caucasian, 24.7% Asian, 7.2% African American, 2.6% Hispanic, while about 5.2% identified with a variety of Other ethnicities. On average participants indicated using these sites 1.84 hr per day ($SD = 1.20$), with a Facebook network size of about 672.24 ($SD = 467.65$).

Participants were first asked to think about two close friends and enter their first names on the survey. Close friends were explicitly defined as relationships characterized by emotional closeness and frequent communication. Next, participants were randomly assigned to one of the two conditions and presented with scenarios describing conversations where they were excluded (the *exclusion* condition; $n = 98$) or included (the *inclusion* condition; $n = 96$). The names of participants' close friends were automatically propagated into the conversations in each condition and participants could not proceed until a 30-s timer expired. Following exposure to the scenario, participants self-reported their levels of positive and negative emotional states.

Measures

Scenarios were designed to depict an excluded or included communication exchange occurring on Facebook. Note that the survey software automatically propagated the names of the participant's close friends—which were collected via the survey earlier—into each scenario. The excluded condition read as follows:

> Imagine that you have been friends with (*name of friend 1*) and (*name of friend 2*) for several years. The three of you would typically hang out every day and tell each other everything that is going on in your life. Recently you have noticed that (*name of friend 1*) and (*name of friend 2*) have been posting on each other's Facebook pages but have failed to include you. This seems unusual because you, (*name of friend 1*) and (*name of friend 2*) always talk as a group, rarely excluding one member from the conversation.

The included condition read as:

> Imagine that you have been friends with (*name of friend 1*) and (*name of friend 2*) for several years. The three of you typically hang out every day and tell each other everything that is going on in your life. Recently you have noticed that (*name of friend 1*) and (*name of friend 2*) have been posting frequently on your Facebook page. This seems unusual because you, (*name of friend 1*) and (*name of friend 2*) rarely post on each other's Facebook pages.

Positive and negative emotional responses were measured by asking participants to indicate how likely they were to experience positive and negative emotions resulting from the scenario (adapted from Hegtvedt, 1990; 10-point Likert-type scale). The positive response scale included feelings of satisfaction, deserving, and gratefulness ($M = 6.07$, $SD = 2.26$; Cronbach's α = .73). Negative

responses included feelings of anger, resentfulness, and helplessness ($M = 5.90$, $SD = 1.94$; Cronbach's $\alpha = .65$).

Network attention was measured with a 5-item scale developed by Badawy et al. (2014) measuring the extent to which individuals know the structure and balance of relationships surrounding them (7-point Likert-type scale, $M = 4.76$, $SD = 1.05$; Cronbach's $\alpha = .84$). Items include "I know who knows who among my SNS friends," "I know which of my SNS friends who are actually friends," "I know who among my SNS friends don't know each other," "Most of my SNS friends know each other," and "I know which of my SNS friends do not like each other."

Results

Manipulation Check

The Statistical Package for Social Sciences Version 24 was used to conduct all analyses in this study. To ensure that the excluded and included conditions were perceived differently, a manipulation check was performed prior to the study. Participants were assigned to read either the excluded ($N = 15$) or included ($N = 16$) scenario. They were asked to imagine themselves in the vignette and indicate whether they would feel left out or hurt in the scenario and how satisfied and angry they felt resulting from the scenario. An independent samples t test revealed that participants in the excluded condition ($M = 5.27$, $SD = 1.71$) significantly felt more left out than those in the included condition ($M = 3.63$, $SD = 2.16$), $t(29) = 2.34$, $p = .03$. Participants in the excluded condition ($M = 4.47$, $SD = 2.13$) also reported feeling more hurt than those in the included condition ($M = 2.69$, $SD = 1.54$), $t(29) = 2.68$, $p = .01$. Significant differences were also found for how satisfied participants felt in the excluded ($M = 2.33$, $SD = 1.35$) and included ($M = 3.50$, $SD = 1.63$) conditions; $t(29) = -2.16$, $p = .04$. Finally, results suggest that those in the excluded condition ($M = 4.00$, $SD = 1.81$) experienced more anger than those in the included condition ($M = 2.38$, $SD = 1.15$), $t(29) = 3.00$, $p = .01$. Overall results suggest that participants perceived the excluded and included scenarios differently.

Negative Emotional Responses

Correlations and descriptive statistics for each variable by condition are presented in Table 1. An independent samples t test was conducted to test the first set of hypotheses. Results of the t test for negative emotional responses indicated a significant effect for experimental condition, $t(192) = 3.13$, $p = .002$, Cohen's $d = .45$. The excluded condition ($M = 5.26$, $SD = 2.02$) experienced greater negative emotional responses than the included condition ($M = 4.44$, $SD = 1.62$). Therefore, Hypothesis 1a was supported.

Positive Emotional Responses

Results from the independent samples t test for positive emotional responses indicated that there was a significant effect for experimental condition, $t(192) = -4.50$, $p = .000$, Cohen's $d = .64$. The included condition ($M = 4.60$, $SD = 1.57$) experienced greater positive emotional responses than those in the excluded condition ($M = 3.49$, $SD = 1.88$). Hypothesis 1b was supported (see Table 2).

Sex Differences

An independent samples t test was conducted to determine whether there were significant differences between males and females on their positive and negative emotional responses. Results indicated that females ($M = 5.83$) reported greater negative emotional responses to the stimuli than

Table 1. Means (Standard Deviations) and Correlations for Variables by Condition.

Variable	Excluded Condition					Included Condition				
	1	2	3	4	5	1	2	3	4	5
1. Age	21.73 (2.18)	−0.22*	0.09	0.19	−.13	21.59 (4.57)	−0.06	0.07	−0.11	.08
2. Network size		600.84 (439.12)	0.06	−0.16	−.03		745.13 (486.60)	−0.19	−0.20*	.02
3. NA			4.79 (1.09)	0.02	0.28**			4.80 (1.08)	0.32**	0.10
4. + Response				3.50 (1.87)	0.06				5.12 (2.04)	0.28**
5. − Response					5.26 (2.02)					3.50 (2.22)

Note. NA = network attention; + = positive emotional response; − = negative emotional response.
*p < .05. **p < .01.

Table 2. Means and F Statistics for Participants Negative and Positive Emotional Responses to Stimuli.

Emotional Response	Excluded	Included	t
Negative responses	5.26 (2.02)$_a$	4.44 (1.62)$_b$	3.13**
Positive responses	3.49 (1.88)$_a$	4.60 (1.56)$_b$	−4.50**

Note. Means in the same row with different subscripts are significantly different.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Independent Samples t Test Between Condition and Sex.

	Negative Responses			Positive Responses		
Condition	Males	Females	t	Males	Females	t
Excluded	4.86 (2.08)	5.83 (1.80)	−2.40*	3.55 (1.90)	3.42 (1.86)	.39
Included	3.44 (2.24)	3.58 (2.21)	−0.29	5.11 (2.30)	5.13 (1.67)	−.38

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

Table 4. Regression Analysis for Excluded Condition on Experiencing Negative Emotions.

	Block 1			Block 2		
Predictors	B	SE	β	B	SE	β
Sex	.97	.41	0.24*	.96	.39	0.24*
Network attention				.51	.18	0.28**
Adjusted R^2			0.05			0.11
F			5.75*			7.27**

Note. 1 = male; 2 = female.
*$p < .05$. **$p < .01$.

males ($M = 4.86$) in the excluded condition only, $t(96) = -2.40$, $p < .05$, Cohen's $d = .50$. No other significant differences were found. Thus, Hypothesis 2 was partially supported (see Table 3).

Network Attention

To test Hypotheses 3a and 3b, two hierarchical linear regressions were performed for each condition using negative and positive emotional responses as the dependent variables. The first model predicting negative emotional responses was significant for the excluded condition, $F(1, 96) = 5.57$, $p < .05$, $\eta^2 = 0.13$, and explained 5.0% of the total variance. Sex ($\beta = 0.24$, $p < .05$) was a significant predictor of negative emotional responses such that females experienced greater negative emotional responses. Next, network attention was added as an additional predictor and this model explained about 11.0% of the total variance. Sex ($\beta = 0.24$, $p < .05$) and network attention ($\beta = 0.28$, $p < .01$) were significant predictors of negative emotional responses. Participants scoring high in network attention experienced stronger negative emotions from the exclusion stimulus. An additional regression analysis was performed for the included conditions. No significant results were found. Thus, Hypothesis 3a was supported (see Table 4).

Next, the models for positive emotional responses were tested. Sex was entered in the first block of the regression, followed by network attention in the second. No significant results for the

Table 5. Regression Analysis for Included Condition on Experiencing Positive Emotions.

Predictors	Block 1			Block 2		
	B	SE B	β	B	SE B	β
Sex	.02	.42	.00	.02	.40	0.00
Network attention				.67	.18	0.35**
Adjusted R^2			−.01			0.11
F			.00			6.65**

Note. 1 = male; 2 = female.
*p < .05. **p < .01.

exclusion condition were found. An additional regression was performed for the included condition. The final model was significant for the included condition, $F(2, 93) = 6.65$, $p < .01$, $\eta^2 = 0.13$, and explained about 13.0% of the total variance. Network attention ($\beta = 0.35$, $p < .01$) predicted positive emotional responses. Thus, Hypothesis 3b was supported (see Table 5).

Discussion

This research is timely considering the intensity and scale of social exchange occurring via social media. Additionally, there are persisting questions regarding the impact of the intersection between interpersonal and mass communication processes occurring on social media. Today, SNS users are frequently exposed to interactions between their friends that do not include themselves, and we argue situations like these may be interpreted as social exclusion. Questions arise about the emotional consequences of frequent exposure to online social exclusion and whether individual differences predict responses to these scenarios.

SNSs provide users with social signals used to determine their standing within their social networks. In an attempt to examine the impact of this social exclusion online, this study employed an experiment to examine individuals' emotional responses to being hypothetically excluded from online interactions between their close friends. Further, we employed a construct called network attention to examine how this trait affects emotional responses to social exclusion online.

Results indicated that individuals exposed to social exclusion stimuli involving their close friends experienced greater negative emotional responses than those in the included condition as expected. Further, those in the excluded condition experienced the least positive emotional responses. These findings support previous social exclusion literature suggesting that individuals facing exclusion experience negative emotions (e.g., Mendes et al., 2008; Murray et al., 2008).

Further, these findings support previous research on how individuals monitor their social environment for social exclusion cues, such as the SMS (e.g., Gardner et al., 2000). Recall, scholars theorize that humans have evolved to automatically respond to social exclusion signals, no matter how trivial, to minimize their chances for rejection. Although we only employed a hypothetical scenario of one instance of social exclusion, we found that individuals still experienced negative emotional responses. From these findings, we speculate that these systems are not only activated in imagined scenarios but also in response to SNS-based communication.

Our findings further support the literature on the potential negative consequences of SNS use. For example, evidence suggests that when individuals are unfriended or otherwise neglected on Facebook, need to belong is threatened and they experience negative emotions like anger (Bevan, Pfyl, & Barclay, 2012). Because being left out of conversations between our friends is a form of social exclusion, it makes sense that individuals experience similar emotional outcomes. Further, this

finding contributes to previous literature which suggests that time spent on SNSs is correlated with negative mood (Sagioglou & Greitemeyer, 2014). Time spent on SNSs increases the probability that individuals observe exchanges among their friends in which they were excluded. Although these interactions are often unintentional, we know that individuals who are excluded generally have more negative and less positive emotional responses.

Stemming from evolution, research also suggests that there are inherent differences in responses to social exclusion from men and women. Specifically, Benenson and colleagues (2013) found that women tend to be more sensitive to social exclusion online than men. Results from this study support these findings such that women reported more negative emotional responses to the stimuli than men. This finding supports and extends social exclusion research in the context of social media. Previous research suggests that women use communication technology for relational maintenance (Boneva & Kraut, 2002) and are more likely to engage in reciprocal relationships through these channels than men (e.g., Barak & Gluck-Ofri, 2007). Therefore, women should experience more negative emotional responses than men when being excluded online because their close friends violated their communication norms. On the other hand, there is evidence for sex-based differences in motivations for SNSs use. Specifically, research suggests that women spend more time managing their profiles and sharing photos online (Stefanone, Lackaff, & Rosen, 2011). Therefore, it is likely that women care more about being excluded online because they spend more time and effort in managing their appearances online. Here, we have evidence that off-line communicative behavior persists online.

Most importantly, our final analyses revealed that network attentive participants experienced stronger emotional responses to the scenarios than those inattentive, which was consistent with our third set of hypotheses. Specifically, we found that network attentive participants experienced stronger negative emotional responses when exposed to the excluded condition and stronger positive emotional responses in the included condition than those inattentive. First, these findings suggest that the network attention is related to how individuals monitor their social environment for social exclusion cues. It is likely that network attention is proxy to the SMS, which suggest that when individuals experience social exclusion they monitor their environment for acceptance opportunities (e.g., Gardner et al., 2000). Network attention builds upon this literature by identifying individuals who attend to their social environment and consequently are better able to detect social exclusion signals regardless of the volume of social information available via SNSs and social media. It is likely because network attentive individuals dedicate their cognitive resources toward their social environment, they may be quicker at detecting social exclusion cues and therefore quicker at activating their SMS. Activating one's SMS at a quicker rate may be advantageous because one can immediately respond to social exclusion signals and therefore rectify the situation.

These findings also support the contention that network attentive individuals centrally process information about their network dynamics, but there is a disconnect when it comes to understanding the technology. We found network attentive individuals experienced negative emotional responses in the excluded condition, we argue that they accurately understood they were left out. However, it seems they failed to understand the reality that they are frequently excluded from interactions between their close friends because they simply cannot participate in every conversation. SNSs push users transcripts of conversations between their friends, which may interpreted as social exclusion signals, although not intentional. Our results suggest that network attention is limited to enhancing individual's understanding of the *social* aspect of their environment.

Additionally, the scenarios explicitly communicated to participants that they were being treated unusually by their close friends. Perhaps network attentive individuals recognized this cue, processed this signal as intentional, and therefore experienced stronger emotional reactions because they felt they were maliciously excluded from the interaction. If network attentive individuals

processed the exclusion signal as unintentional, then we would expect to see weaker negative emotional responses to the stimuli. Future research should examine whether or not network attentive individuals process these signals as intentional forms of social exclusion.

Network attention is a relatively novel construct in the field, although extant research based on survey and experimental data support the idea that this trait is associated with systematic differences in how individuals process social information available in their environment (e.g., Badawy et al., 2014). This is the first study to test network attention in the context of social information processing and social media, and clearly more research is needed in this area.

Limitations

This study has several limitations. The first limitation is that hypothetical scenarios were presented to participants, which could threaten the external validity of our results. Future research should refine these scenarios to enhance the realism of the scenarios and overall the effectiveness of our manipulation. Second, this study only used 3 items for each scale to capture participants' emotional responses to the scenarios. Additional items should be included to increase the reliability and validity of these measures. Third, we did not measure perceived intentionality in our main study. The question about whether individuals perceive exclusion signals on SNSs is an important one, and the current study is not able to address this. Future research examining how perceived intentionality affects emotional responses to social exclusion signals would be productive. Fourth, this study employed a college student sample. Although evidence suggests that these individuals are heavy users of SNSs (Greenwood et al., 2016), further research should attempt to replicate these findings with older and increasingly diverse participant samples as college students are not representative of the broader population. Additionally, these scenarios were designed specifically for our undergraduate sample and reflect how they typically communication with each other. To further increase the generalizability of our findings, future research should use scenarios with language tailored to older adults' typical communication patterns.

Future Directions

This study presents several directions for future research. First, future research should increase the realism of these scenarios by including more representative online social exclusion stimuli. This could be accomplished by increasing the amount of social information available. For example, experimental procedures could employ actual screenshots of participants' friends interacting online without them (e.g., SNS profile images). Further, it would be interesting to see how individuals respond to a series of social exclusion occurrences versus a single event of social exclusion. Additionally, it would be worthwhile to investigate whether how different social media affordances (e.g., publicness, persistence) produce varying emotional responses to online social exclusion. Further, an argument could be made that more comprehensive understanding of the social environment via network attention should be associated with dampened emotional responses to exclusion because network attentive individuals should better understand that exclusion signals are not intentional. Future research should further examine how network attention varies systematically with perceived intentionality of online and off-line social exclusion signals. Additionally, participants were provided with just one communication exchange, which is a fraction of the overall communicative history between close friends. Developing protocols to more effectively address the historical context of close friends is certainly an area for future research.

SNS users are exposed to potential exclusion signals as a routine part of using these services. Still, there are questions about the specific processes and consequences associated with social

exclusion online including whether individuals invest cognitive resources to affect regulation (Baumeister et al., 2002) and evaluating the consequences of doing so. Considering that the business models of SNSs are based on advertising revenue, and users are exposed to advertising as a routine part of using these services, users who suffer the effects of (un)intentional social exclusion and invest cognitive resources in affect regulation may be more susceptible to the persuasive strategies embedded in advertising. Social exchange, exclusion, and cognition in the context of social media platforms optimized to propagate persuasive messages is an important area for future research.

Conclusion

This research offers insight into how individuals process and respond to the social information pushed to SNS users on a daily basis. Evaluating the range of possible outcomes related to online exclusion signals will help us to better understand the many unanticipated consequences of social media use.

Authors' Note

Declaration of Conflicting Interests

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