#thanksfortheinvite: Examining Attention to Social Exclusion Signals Online

Jessica M. Covert
University at Buffalo
Department of Communication
Buffalo, USA
jcovert@buffalo.edu

Michael A. Stefanone
University at Buffalo
Department of Communication
Buffalo, USA
ms297@buffalo.edu

Brooke Foucault-Welles
Northeastern University
Department of Communication Studies
Boston, USA
b.welles@neu.edu

Zhiying Yue
University at Buffalo
Department of Communication
Buffalo, USA
zyue@buffalo.edu

Zena Toh
University at Buffalo
Department of Communication
Buffalo, USA
zenatoh@buffalo.edu

ABSTRACT

Social media provides users with public and persistent transcripts of conversations between their friends. Although often unintentional, these records can be interpreted as social exclusion signals. This study randomly assigned 163 participants to one of two conditions where they were exposed to hypothetical written scenarios describing conversations between their friends in which they were excluded or included. Results suggest that individuals in the excluded condition experienced more negative and less positive affect than those in the included condition. Further, we found that network monitoring—a multidimensional construct assessing individual differences in cognitive resources dedicated towards understanding one's social network—affected individuals' emotional responses to the stimuli. Specifically, network social awareness and advantage were significant predictors of negative affect in the excluded condition. Results are discussed in terms of theoretical and practical implications.

SMSociety '18, July 18–20, 2018, Copenhagen, Denmark

ACM ISBN 978-1-4503-6334-1/18/07…$15.00
https://doi.org/10.1145/3217804.3217897

CCS CONCEPTS

• **Networks → Social media networks •Networks → Social media**

KEYWORDS

Social Media, social exclusion, emotion

ACM Reference format:
Jessica M. Covert, Michael A. Stefanone, Brooke Foucault-Welles, Zhiying Yue and Zena Toh. 2018. #thanksfortheinvite: Examining Attention to Social Exclusion Signals Online.
In Proceedings of the *International Conference on Social Media & Society*, Copenhagen, Denmark (SMSociety).
DOI: 10.1145/3217804.3217897

1 INTRODUCTION

Social media platforms are considered networked publics because they (1) connect individuals with one another and (2) provide spaces in which individuals can interact and exchange information [1]. Boyd [1] suggests that these networked publics provide four structural affordances that include persistence, replicability, scalability and searchability. These affordances grant users access to records of social exchange between members of their social networks. Transcripts of conversations between users' friends are pushed through notifications and archived so that individuals can see who is talking to whom, how often, and what they are talking about. Access to this information can help individuals determine their standing within their network. Although these affordances vary across different social media platforms, communication is generally public.

We choose to focus on Facebook because users have access to communication records between their friends.

Humans are driven to develop and maintain relationships with others, which is known as 'the need to belong' [2]. Individuals monitor their environment for social exclusion signals [3] and automatically respond to these cues to minimize their chances of rejection [4]. We argue that exposure to online transcripts of conversations between our friends *can* be interpreted as social exclusion because we are often not included in these interactions. The primary goal of this study is to examine if and how individuals respond to these online social exclusion signals. Further, given the volume of social exchange online, an overload of information likely impedes cognitive processing abilities [5], thus it is unclear who actually attends to the glut of social information available via social media.

It is likely individuals differ in terms of how they systematically attend to, process and respond to online social exclusion signals. Network monitoring is a construct which assesses the tendency for individuals to dedicate cognitive resources towards attending to the pattern of ties in their social networks. We examine how this trait explains emotional responses to social exclusion.

This work is conceptually situated in the broader literature describing relationships and social capital—the resources embedded in one's social network [6]. Although there is a growing body of research examining the impact of social media on social capital [e.g.,7], little is known about this phenomenon in the context of social exclusion. Specifically, it is unclear how an individual's attention to their social network effects their perception of their standing within their network and subsequently access to opportunities the network could provide. It is likely that individuals who dedicate their cognitive resources towards understanding their network, are better equipped to navigate their social sphere and thus, decrease their chances of social exclusion.

The purpose of this study is to evaluate and extend social exclusion research by examining how individuals respond to social exclusion signals available online, and how these responses vary depending on network monitoring. The literature review is structured as follows. First, we review the need to belong and social exclusion literature. Then, we discuss social exclusion online and network monitoring, followed by a description of the study itself.

2 LITERATURE REVIEW

2.1 Social Exclusion

Fulfilling the need to belong is a fundamental motivation of human behavior [2]. Because individuals are driven to achieve belongingness— acceptance and affiliation from others—they must dedicate cognitive resources to understanding and managing their social networks. Individuals who unsuccessfully navigate these relationships experience negative psychological and physical consequences.

Evolutionary perspectives suggest that survival motivates individuals to satisfy the need to belong. Individuals that are able to integrate themselves into groups have access to shared resources (e.g., food, childcare, protection, etc.), which facilitates survival and reproduction [8]. However, groups must selectively exclude others because shared resources are limited. Therefore, exploitive individuals who violate norms are often excluded from the group. Living in isolation is often detrimental to survival as obtaining these resources alone is challenging. Therefore, group inclusion enables survival and exclusion often leads to death [9].

Scholars have theorized that because survival is reliant on group membership, individuals have developed counter-adaptations to detect and respond to exclusion signals to increase their prospects of inclusion. For example, Gardner, Pickett and Brewer [3] proposed a model of belonging regulation which suggests that humans have regulatory systems devoted towards maintaining satisfactory levels of inclusion. Individuals monitor their environments for social information relating to their acceptance level. If an individual's need to belong is not satisfied, then they will continue surveilling their environment for inclusion opportunities. Further, Williams and Zadro [4] proposed the indiscriminate early detection system which describes individuals' automatic responses to social exclusion signals.

Research supports these detection and response models of social exclusion. For example, after experiencing social exclusion, participants are more likely to conform to group opinions [10] and mimic their interaction partner's body language [11] to maximize their chances of inclusion. Additionally, Gonsalkorale and Williams [12] found that individuals quickly respond to neutral reactions, minor snubs, and trivial exclusions as if they had tremendous consequences, even when the exclusion comes from others whose acceptance is inconsequential. Although this research provides insight into individuals' social exclusion signal detection and response systems, there is mixed evidence for the consequences of experiencing rejection.

According to Baumeister and Leary [2] because the desire for acceptance is a fundamental need, individuals should experience cognitive, emotional, and behavioral consequences when this need is thwarted. Research supports this contention for cognitive and behavioral effects. For example, social exclusion evokes neural activity similar to when feeling physical pain [13] and has been linked to increased aggressive behavior [14]. However, the emotional consequences of social exclusion are less clear.

Evidence suggests that individuals have varying emotional responses to social exclusion. Some evidence finds excluded individuals experiencing higher levels of

negative affect [15], lower levels of positive mood [16], and even little to no emotional responses [17]. Additionally, emotional responses inconsistently mediate the relationship between social exclusion and behavioral outcomes [14].

Blackhart and colleagues [18] analyzed 192 studies to examine the mixed support for emotional responses to exclusion. To compare findings between studies, an absolute measure of effect was calculated to account for the different emotion measures used in each study. The meta-analysis revealed that excluded individuals often feel worse than those included or in neutral conditions, but not necessarily bad. Specifically, excluded individuals tend to experience neutral or slightly positive emotional responses. Additionally, in regards to the social exclusion manipulations, the greatest emotional responses were found when participants imagined experiencing rejection rather than exclusion from groups of research confederates [19], or when reflecting on their past experiences with social exclusion [20].

To begin understanding the effects of social exclusion online, we propose examining individuals' emotional responses to imagined—though realistic— manipulations of exclusion occurring on social media. Given the proliferation of communication via social media, users have access to transcripts of conversations between their friends. An example would be exchanges that occur on one's Facebook profile that include posting comments and media content. Although this exclusion is often unintentional, access to these interactions may actually be interpreted as cues signalling threats to belonging.

2.1.1 Social exclusion online. Before new communication technology like social media, conversations were generally private and only those directly participating in interactions had access to exchanged information. Exposure to social exclusion signals occurred during real time, face-to-face exchanges where someone was explicitly left out of conversations or by talking to others to learn about interactions they were excluded from. However, this is no longer the case given the affordances of social media.

Social media provides public platforms through which individuals can connect and communicate with one another [1]. These network publics afford users the ability to observe transcripts of conversations among friends, which increases the likelihood of encountering social exclusion signals. Specifically, social media affords individuals persistence, replicability, scalability, and searchability [1]. Persistence suggests that online interactions are recorded and archived in the platform. Replicability suggests that interactions on social media can be duplicated. Scalability suggests that the probability of others viewing interactions online is high. Lastly, searchability suggests that individuals in these networked public can easily search for or find out this information online.

On social media—Facebook in particular—friends share digital content with each other like photos, videos, and news articles. These conversations are then pushed to others in the network through notifications on social networking sites, smartphones, or other communication devices. Transcripts of conversations are archived so that users can seek out past exchanges to see who is conversing with whom and what they are talking about. Further, individuals can take screen shots or pictures of these conversations to save to view at a later time or show their friends. Given the ubiquity of these affordances, the probability in which individuals encounter social exclusion signals or interactions between their friends in which they are not included is high.

Although these exclusion signals are often unintentional and not malicious, given what we know about humans' exclusion detection and response systems, we speculate that individuals will have emotional responses to these cues. Individuals surveil their social environment for exclusion signals and automatically respond to these cues to minimize their chances for rejection and maximize their opportunities for inclusion.

Although research suggests that individuals are often motivated to use social media to achieve belongingness [21], evidence suggests there are negative emotional outcomes to using these sites. Specifically, social media use is associated with negative affect, lower life satisfaction [22], and negative mood [23]. Being unfriended on Facebook—which is a form of social exclusion—is associated with rumination and negative emotions such as anger and depression [24]. Further, having unresponsive friends on social media threatens fundamental human needs including belongingness and self-esteem [25]. Drawing from this previous research, we speculate that exposure to social exclusion signals online should elicit similar negative emotional responses as to being excluded offline. Thus, we propose:

H1a: Participants in the excluded condition experience stronger negative affect than those in the included condition.

H1b: Participants in the included condition experience stronger positive affect than those in the excluded condition.

2.2 Network Monitoring

As previously stated, humans have an inherent ability to detect and respond to social exclusion signals [3, 4]. However, individual differences may explain how sensitive human detection and response systems are. For example, network monitoring is a construct that taps into the tendency for individuals to dedicate cognitive resources towards attending to the pattern of ties in their social networks. Network monitoring extends a previous concept known as

'network attention', originally called 'awareness' [6]. Network attention assesses "the extent to which individuals understand the structure of interpersonal relationships comprising their online social networks" [6, p. 1569]. Badawy et al. [6] suggest that network attentive individuals dedicate cognitive resources towards understanding their social environment and, therefore, understand the structure and equity statuses of their social network.

Stefanone et al. [26] further developed this construct by examining how network attentive individuals attend to, process, and understand the social structure of novel situations in real time. Specifically, they administered four-minute video clips varying in social complexity followed by a quiz assessing the character's past, current, and future relationships. Results suggest that network attention significantly predicted not only accuracy, but confidence in responses. This suggests that network attention helps individuals monitor and successfully navigate their social environments. Perhaps, this trait is useful when detecting and responding to social exclusion signals.

Building on this research, network monitoring is comprised of four conceptually distinct dimensions which make up one's ability to accurately identify and activate their social networks: network advantage, social awareness, structural awareness, and actualization. Network advantage assesses one's networking and matchmaking abilities. Network social awareness address one's ability to acquire information about relationships in their social circle. Network structural awareness parallels network attention such that it measures the extent to which one is aware of 'who knows whom' among their network. Finally, network actualization assesses one's ability to turn social resources into benefits.

Individuals scoring high on network monitoring dedicate cognitive resources towards understanding and activating their social networks. From an elaboration likelihood model perspective (ELM; 27]), we argue that network monitors are more likely to use the central route when processing social information. Central processing occurs when individuals are highly motivated and are able to think about messages. Thinking requires engagement and effort. Likewise, peripheral processing occurs when individuals have low motivation and ability to think about a message. Therefore, they process information with relatively low engagement and effort. Low network monitors are more likely to take the peripheral route when assessing their social sphere.

Although network monitoring is a relatively new construct, we can draw on previous research to predict that those scoring high on network monitoring will be better at detecting social exclusion signals. Because these individuals centrally process social information, they should be able to accurately monitor and respond to social exclusion signals online. Therefore, when they are excluded from an interaction between their friends online, they should experience negative affect. Likewise, when they are included in interactions online, they should experience positive affect. Thus, we propose:

H2a: Network monitoring is associated with experiencing negative affect in the excluded condition.

H2b: Network monitoring is associated with experiencing positive affect in the included condition.

Although network monitoring assesses individuals' understanding and activation of their social network, we are interested in how certain network monitoring sub-dimensions vary with emotional responses to experiencing exclusion and inclusion online. In particular, we expect that network social awareness and advantage should predict negative affect when excluded and positive affect when included. Individuals high on network social awareness pride themselves on understanding the dynamics of their social circle. They pay attention to the subtle changes in their network. For example, they are the first to know when conflict is starting between their friends or who owes who favors because they are in tune to the gossip in their social network. As their awareness stems from the ability to accrue social information, these individuals should experience negative affect when excluded and positive affect when included. When individuals rank high on network social awareness are excluded they should have negative emotional responses. This is because being left out of interactions between their friends is unexpected and suggests that they failed to acquire the appropriate social information to comprehend their standing within their network. Likewise, those who rank high on network social awareness should experience positive emotional responses when they are included because it validates their ability to know the dynamics of their relationships. Thus, we propose:

H2c: Network social awareness is negatively associated with experiencing negative affect in the excluded condition and positive affect in the included condition.

Further, we suspect that individuals scoring high on network advantage should experience negative affect when excluded and positive affect when included. Network advantage is associated with having strong networking and matchmaking abilities, these individuals work hard towards building relationships with others. Individuals high on network advantage actively maintain their network so that they have resources to draw on when trying to advance themselves. Therefore, they should feel bad when they are excluded because this indicates some degree of failure to networking. When they are included they should feel good because this means they were successful at networking. Thus, we propose:

H2d: Network advantage is associated with experiencing negative affect in the excluded condition and positive affect in the included condition.

2.3 Perceived Intentionality

As described above, social exclusion signals online are constantly pushed to social media users through notifications. Although research suggests that individuals automatically respond to social exclusion signals [4], we are interested in the degree to which individuals perceive these social exclusion signals online as intentional and how this affects their emotional responses. We can speculate that those who perceive these social exclusion signals as more intentional will experience stronger emotions. Thus, we propose:

H3a: Perceived intentionality is associated with experiencing stronger negative affect in the excluded condition.

H3b: Perceived intentionality is associated with experiencing stronger positive affect in the included condition.

3 METHOD

3.1 Participants and Procedure

During the fall semester of 2017, a total of 181 Facebook users from a large northeastern university in the United States completed the experiment 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 social media [28]. We removed 18 participants from the subsequent data analyses due incomplete data and failing our attention check (i.e., questions that asked participants to choose a specific answer), thus our final sample is comprised of 163 participants (86 Female, 77 Male). After obtaining consent, participants were directed to complete the experiment and survey items, which were administered using the survey software, Qualtrics. Participants averaged 20.29 years of age (SD = 2.36) and were 55.2% Caucasian, 21.5% Asian, 11.0% African American, 9.2% Hispanic, while about 3.1% identified a variety of other ethnicities. On average, participants indicated using Facebook about 2.45 hours per day (SD = 1.50), with a network size of about 757.68 (Mdn = 647.00, SD = 691.44).

First, participants were asked a series of questions including their demographic information, the size of their online network, time spent on SNSs, and their level of network monitoring. Second, they were 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 two conditions and presented with scenarios describing conversations where they were excluded (the exclusion condition; n = 81) or included (the inclusion condition; n = 82). The names of participants' close friends were automatically inserted into the scenario and participants could not proceed until a 30-second timer elapsed. Following exposure to the scenario, participants self-reported their levels of positive and negative affect. Further, those in the excluded and included condition answered a series of questions about how intentional they thought their close friends were being in the scenario.

3.2 Measures

Scenarios were designed to depict a communication exchange occurring on Facebook in which the participant was excluded or included. 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. Because you are close friends, the three of you would typically hang out every day and tell each other everything that is going on in your lives. 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."

The included condition read as:

"Imagine that you have been friends with (*name of friend 1*) and (*name of friend 2*) for several years. Because you are close friends, the three of you typically hang out every day and tell each other everything that is going on in your lives. Recently you have noticed that (*name of friend 1*) and (*name of friend 2*) have been posting frequently on your Facebook page."

Network monitoring was measured using 27-items measured on a 7-point Likert scale modified from Badawy, Stefanone, and Brouer's [6] original network awareness scale which assessed individuals' tendency to dedicate cognitive resources towards attending to the pattern of ties in their social networks (M = 4.89, SD = .80, α = .94). The network monitoring construct is made up of four conceptually distinct dimensions. The network advantage dimension (M = 4.69, SD =.94, α = .84) had nine items and measured individuals' networking and matchmaking abilities. A sample item included "I consider myself to be a great networker." The network social awareness dimension (M = 4.70, SD = .98, α = .90) had nine items which measured knowledge of relationship status changes in their social circle, as well as drama and gossip. A sample item included: "When people in my social circle change their relationship, I usually know about it." The network

Table 1: Means (Standard Deviations) and Correlations for Variables

		1	2	3	4	5	6	7	8	9	10	11
1.	Age	20.17 (2.36)	-.18*	-.09	-.24**	-.02	-.09	.03	-.06	-.06	-.13	.06
2.	Sex		53% F	.04	.25**	.04	.16*	.10	.12	.14	-.07	-.03
3.	Network Size			757.68 (691.44)	-.02	.02	.01	.08	.14	.08	.01	.17*
4.	Time Spent				2.45 (1.50)	.01	.21**	.18*	.20**	.22**	.05	-.03
5.	Structure Awareness					5.35 (.90)	.43**	.35**	.35**	.53**	-.05	.09
6.	Social Awareness						4.70 (.98)	.59**	.75**	.92**	.09	.16*
7.	Network Actualization							5.25 (.95)	.63**	.79**	-.07	.16*
8.	Network Advantage								4.69 (.94)	.89**	-.02	.28**
9.	Network Monitoring									4.89 (.80)	.01	.19*
10.	Negative Affect										17.53 (7.74)	.27**
11.	Positive Affect											22.94 (8.24)

Note. $*p < 0.05$, $**p < 0.01$

actualization dimension (M = 5.25, SD = .95, α = .90) had six items which measured individuals' abilities to turn social resources into benefits. A sample item included: "If I need something, I always know exactly who to ask." Lastly, the network structure awareness dimension (M = 5.35, SD = .90, α = .81) had three items which measured individuals' knowledge of who-knows-who in their social networks. A sample item included: "I know which of my friends know each other." See appendix for full scale items.

Positive and negative affect was measured on a 5-point scale (1 = not at all to 5 = extremely) using Watson, Clark, and Tellegen's [29] 20-item measure which yields separate scores for positive (M = 24.00, SD = 8.64, α = .89) and negative affect (M = 16.89, SD = 7.63, α = .90). Participants were asked to indicate the degree to which they felt each emotion. Scores were summed to indicate the extent to which they experienced positive and negative affect.

Perceived intentionality was measured on a 7-point Likert scale which assess the degree to which participants believed they were purposefully excluded from or included in the interactions between their close friends. Two separate scales were constructed for the excluded and included condition (excluded intentionality: M = 2.98, SD = 1.40, α = 0.82; included intentionality: M = 5.02, SD = .83, α = 0.72). One item was dropped from the excluded intentionality scale as it affected the scale reliability.

4 RESULTS

The Statistical Package for Social Sciences (SPSS) was used to conduct all analyses in this study. Correlations and descriptive statistics for both conditions are presented in Table 1.

4.1 Negative Affect

An independent samples t-test was conducted to test the first set of hypotheses. Results indicated a significant effect for experimental condition, t (161) = 3.64, $p < .001$, Cohen's d = .57. The excluded condition (M = 19.67, SD = 8.16) experienced greater negative affect than the included condition (M = 15.41, SD = 6.71). Hypothesis 1a was supported.

4.2 Positive Affect

Results from the independent samples t-test for positive affect indicated that there was a significant effect for experimental condition, t (161) = -2.86, p = .005, Cohen's d = .45. The included condition (M = 24.73, SD = 8.92) experienced greater positive affect than the excluded condition (M = 21.12, SD = 7.08). Hypothesis 1b was supported.

4.3 Network Monitoring

As network monitoring is a relatively new construct, an exploratory factor analysis (EFA) was conducted using

Varimax rotation. A four-factor solution (KMO = .91, Bartlett's Test $\chi^2 = 2641.19$, $p = .000$) explaining 61.27% of the variance was found. Examination of the scree plot confirmed the four-factor solution, which was consistent with the proposed constructs.

To examine predictors of negative and positive affect, separate linear regressions were conducted separately for each condition. In the excluded condition, results revealed that network monitoring was not a significant predictor of negative affect in the excluded condition. Therefore, Hypothesis 2a was not supported. Additionally, network monitoring was not a significant predictor of positive affect, as expected.

In the included condition, results revealed that network monitoring was a significant predictor of positive affect, $F(1,81) = 4.50$, $p = 0.04$, $\eta^2 = 0.05$, and explained 4.1% of the total variance. Network monitoring ($\beta = 0.23$, $p = 0.04$) was a positive predictor of positive affect, such that those who dedicate resources towards understanding their network experienced greater positive affect when included. Therefore, Hypothesis 2b was supported. Additionally, network monitoring was not a significant predictor of negative affect, as expected.

To test Hypotheses 2c separate linear regressions were conducted for the excluded and included condition using network social awareness as the predictor variable. In the excluded condition, the model was significant, $F(1,80) = 3.75$, $p = 0.05$, $\eta^2 = 0.05$, and explained 3.3% of the total variance. Network social awareness ($\beta = 0.21$, $p = 0.05$) was a positive predictor of negative affect in the excluded condition. Therefore, individuals with the ability to acquire information about their social circle experienced more negative affect when excluded online. Network social awareness was not a significant predictor of positive affect in the excluded condition, as expected.

The above analysis was conducted in the included condition. Results revealed that network social awareness was not a significant predictor of positive affect in the included condition. Network social awareness was also not a significant predictor of negative affect in the included condition, as expected. Thus, Hypothesis 2c was partially supported.

To test Hypotheses 2d separate linear regressions were conducted for the excluded and included condition using network advantage as the predictor variable. In the excluded condition, the model was significant, $F(1, 80) = 5.37$, $p = 0.02$, $\eta^2 = 0.06$, and explained 6.4% of the total variance. Network advantage ($\beta = 0.25$, $p = 0.02$) was a positive predictor of negative affect in the excluded condition. Unexpectedly, network advantage ($\beta = 0.29$, $p = 0.01$) was found as a significant predictor of positive affect in the excluded condition. The model was significant, $F(1, 80) = 7.50$, $p = 0.01$, $\eta^2 = 0.09$, and explained 7.5% of the total variance.

In the included condition, the model was significant, $F(1, 81) = 6.26$, $p = 0.01$, $\eta^2 = 0.07$, and explained 7.3% of the total variance. Network social awareness ($\beta = 0.27$, $p = 0.01$) was a positive predictor of positive affect in the included condition. Therefore, individuals who have great networking and matchmaking abilities experienced greater negative affect when excluded and greater positive affect when included. Network advantage ($\beta = -0.26$, $p = 0.02$) was found as a significant negative predictor of negative affect in the included condition. The model was significant, $F(1, 81) = 5.67$, $p = 0.02$, $\eta^2 = 0.07$, and explained 5.5% of the total variance. Therefore, individuals high on network advantage experienced less negative affect when included. Thus, Hypothesis 2d was supported. Results are presented in Table 2.

Table 2: Predictors of Affect for the Excluded and Included Condition

	Excluded Negative Affect				Included Positive Affect			
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Network Monitoring					.23**	.87		
Social Awareness	.21*	.92						
Network Advantage			.25*	1.03			.27**	
Adj. R^2		.03		.05		.04		.06
F		3.75*		5.37*		4.50*		6.26**

Note. *$p < 0.05$, **$p < 0.01$

4.5 Perceived Intentionality

Next, we examined if perceived intentionality was a predictor of negative and positive affect for the excluded and included conditions. The first model predicting negative affect for the excluded condition was significant, $F(1,80) = 33.44$, $p = 0.00$, $\eta^2 = 0.30$, and explained 29.0% of the total

Table 3: Affective Responses to Intentionality

	Negative Affect				Positive Affect			
	β	*SE*	*β*	*SE*	*β*	*SE*	*β*	*SE*
Excluded								
Intentionality	.55**	.55			.30**	.54		
Included								
Intentionality			-.23*	.88			.25*	1.17
Adj. R^2		.29		.04		.08		.05
F		33.44**		4.40*		7.69**		5.23*

Note. *$p < 0.05$, **$p < 0.01$

variance. Perceived intentionality ($\beta = 0.55$, $p < 0.01$) was a significant positive predictor of negative affect, such that those who perceived the exclusion as more intentional experienced greater negative affect. The second model predicting positive affect for the excluded condition was significant, F (1,80) = 7.69, p = 0.00, η^2 = 0.09, and explained 7.0% of the total variance. Perceived intentionality ($\beta = 0.40$, $p < 0.01$) was a significant positive predictor of positive affect, such that those who perceived the exclusion as more intentional experienced greater positive affect. Therefore, Hypothesis 3a was supported.

The perceived intentionality model predicting negative affect for the included condition was significant, F (1,82) = 4.40, p = 0.04, η^2 = 0.05, and explained 4.0% of the total variance. Perceived intentionality (β = -0.23, p = 0.04) was a significant negative predictor of negative affect, such that those who perceived the inclusion as more intentional experienced less negative affect. The second perceived intentionality model predicting positive affect for the included condition was significant, $F(1, 81) = 5.23$, $p = 0.03$, η^2 = 0.06, and explained 5.0% of the total variance. Perceived intentionality ($\beta = 0.25$, $p = 0.03$) was a significant positive predictor of positive affect, such that those who perceived the inclusion as more intentional experienced greater positive affect. Therefore, Hypothesis 3b was supported. Results are presented in Table 3.

5 DISCUSSION

Social media provides users with public and persistent transcripts of conversations between their friends, which may be interpreted as social exclusion signals. Given the proliferation of social media, questions arise as to who attends to these signals and how they are interpreted. To begin understanding the impact of these signals, this study exposed participants to hypothetical scenarios in which they were excluded from interactions between their friends online and we measured their emotional responses. Further, we employed a construct called network monitoring to understand the variations in emotional responses to social exclusion signals online. Additionally, we measure how perceived intentionality affects these emotional outcomes.

As expected, findings from our study indicated that individuals excluded from interactions between their close friends online experienced greater negative affect than those in the included condition. Although there is mixed support for emotional responses to social exclusion in offline settings [see 18 for a review], our findings suggest that when individuals encounter exclusion online they experience negative affect. We speculate that our findings result from the exclusion occurring in public setting. Social media affordances (i.e., persistence, replicability, scalability and searchability) provide individuals access to real time and past exchanges between their networks. Therefore, interactions that occur on social media are visible to one's entire network. When exclusion occurs on these sites, it may hurt more than when excluded offline because everyone can see it.

These results also support previous research that suggests individuals' have internal systems that detect and automatically respond to social exclusion signals [3, 4]. As outlined in Section 2.1, evolutionary perspectives suggest that survival was dependent on one's abilities to detect and respond to threats to belonging. Although our study employed imagined scenarios where individuals were excluded from interactions between their close friends online, we still found that our participants experienced negative affect. Therefore, we can conclude that these detection and responses systems apply to social media-based communication.

Further, these findings help explain possible negative intrapersonal consequences of social media. Research suggests that time spent on social media is correlated with negative affect [22] and moods [23]. Given the volume of social exchange online, time spent on social media increases the probability that individuals will observe interactions in which they were not included. Although this exclusion is often unintentional, we know that individuals generally

detect and respond to signals that convey any indication of social exclusion.

Our next analyses examined how network monitoring affects individuals' responses to social exclusion online. Network monitoring assesses the extent to which individuals dedicate their cognitive resources towards understanding their social network.

Results suggested that network monitoring did not predict negative affect in the excluded condition. However, we did find that those who rank high on network monitoring experienced more positive affect in the included condition. Perhaps our exclusion manipulation was not threatening enough to elicit negative emotional responses. Further, it is likely that individuals high on network monitoring understand that access to these social exclusion signals is a function of social media affordances and not necessarily indicators of their standing within their relationship. This is an important area for future research.

Next, we were interested in examining how some of the individual dimensions of network monitoring affected individuals' emotional reactions. Network social awareness reflects ones' ability to acquire information about one's social network. In the excluded condition, results suggested that network social awareness was a significant predictor of negative affect. It is likely that individuals who rank high on network social awareness experienced negative affect when excluded online because they are typically in tune with the relationship statuses between individuals in their network. Therefore, when these individuals are excluded they may be surprised and experience more negative emotions because the exclusion was unexpected and inconsistent with their own acquired information. Note that in the included condition, we found that social network awareness was associated with experiencing positive affect. We speculate that when these individuals are included they are provided validation that their assessment of their network is correct and therefore, they feel good about it.

We also found that network advantage was associated with experiencing negative affect in the excluded condition. Network advantage captures one's networking and matchmaking abilities. We speculate that excluded individuals high on network advantage experienced negative affect because this exclusion signifies that they failed at managing their relationships within their network or networking—which is one aspect of network advantage. Unexpectedly, we found that network advantage was also a predictor of positive affect in the excluded condition. We speculate that although these individuals are being excluded, their friends interacting without them could signify that they are actually good at matchmaking. Further, we speculate that positive affects occurred in the excluded condition as individuals may have felt that they were not a good fit for that particular network. Thus, being excluded from the group elicited positive affects as individuals could have perceived that they do not have to waste their social and cognitive resources by networking with incompatible individuals.

Finally, we investigated how perceived intentionality affected individuals' emotional responses to social exclusion signals online. In the excluded condition, we found that perceived intentionality was a positive predictor of both negative and positive affect. We suspect that perceived intentionality predicted negative affect because individuals are explicitly excluded from the group. However, it is possibly that perceived intentionality is associated with positive affect in the excluded condition because individuals recognize that although this exclusion was intentional, it was not meant to cause harm. They understand that there will be times when their friends will converse without them online. As expected, we found that perceived intentionality was a negative predictor of negative affect in the included condition. Individuals that perceived the inclusion as more intentional experienced less negative affect.

5.1 LIMITATIONS

This study has several limitations. First, the use of imagined scenarios could threaten the external validity of our results. To increase the effectiveness of our manipulation these scenarios should be refined to enhance the realism. Further, our scenarios only referred to posting messages online. Future studies could look into how different forms of online exclusion (e.g., not being invited to a social event page) may influence emotional responses. Next, our study employed a college student sample. Although college students are heavy users of SNSs [28], further research should use older and increasingly diverse samples to increase the generalizability of these findings. Similarly, these scenarios depict typical communication patterns of undergraduate students. Future research should design scenarios with language and communication patterns similar to those of the population of interest.

5.2 Future Directions

This study presents several avenues for future research. First, future research should examine how exposure to social exclusion signals affects individuals' cognitive processing abilities and their subsequent behaviors. Research suggests that individuals experiencing social exclusion have reduced intelligent thought [36]. Therefore, it is possible that individuals regularly attending to these social exclusion signals are more susceptible to persuasion tactics online as they do not have the cognitive abilities to centrally process these messages. Additionally, future research should examine the differences between individuals' emotional responses to isolated incidents of social exclusion or inclusion versus scenarios where this reoccurs over time.

Finally, the relationship between network monitoring and social exclusion online should be examined in the context of accruement of social capital. Specifically, individuals who attend to their social environment may be better at detecting social exclusion signals, which may increase their opportunity of social capital accruement.

6 CONCLUSION

Given the volume of social exchange available online, this study provides insight to how individuals process and respond to social information. We found that individuals experiencing social exclusion online experience negative emotional outcomes and likewise, inclusion online is associated with positive affect. Further, we found there were individual differences in how individuals attend to these social exclusion signals online and subsequently their emotional reactions.

REFERENCES

[1] dana boyd. 2010. *Social network sites as networked publics: Affordances, dynamics, and implications.* Routledge, New York, NY.

[2] Roy F. Baumeister and Mark R. Leary. 1995. The need to belong: desire forinterpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 3 (1995), 497-529. DOI: 10.1037/0033-2909.117.3.497

[3] Wendi L. Gardner, Cynthia L. Pickett and Marilyn B. Brewer. 2000. Social exclusion and selective memory: How the need to belong influences memory for social events. *Personality and Social Psychology Bulletin*, 26, 4 (2000), 486-496. DOI: 10.1177/0146167200266007

[4] Kipling D. Williams and Lisa Zadro. 2005. Ostracism: The indiscriminate early detection system. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *Sydney Symposium of Social Psychology series. The social outcast: Ostracism, social exclusion, rejection, and bullying*. New York, NY, US: Psychology Press. 19-34.

[5] Manquel Gomez-Rodriguez, Krishna Gummadi and Bernhard Schoelkopf. 2014. Quantifying information overload in social media and its impact on social contagions. In *Proceedings of the Eighth International Conference on Weblogs and Social Media (ICWSM 2014)* AAAI Press: Ann Arbor, MI, USA, 170-179.

[6] Rebecca L. Badawy, Michael A. Stefanone and Robyn L. Brouer. I'm not just wasting time online! Test of situational awareness: An exploratory study. 2014. In *Proceedings of the Hawaii International Conference on System Sciences (HICSS 2014)* IEEE: Waikoloa, HI, USA, 1566-1575. DOI: 10.1109/HICSS.2014.201

[7] Michael A. Stefanone, Kyounghee Hazel Kwon and Derek Lackaff. 2012. Exploring the relationship between perceptions of social capital and enacted support online. *Journal of Computer-Mediated Communication*, 17, 4 (2012), 451-466. DOI: 10.1111/j.1083-6101.2012.01585.x

[8] David M. Buss and Douglas T. Kenrick. 1998. Evolutionary social psychology. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology*. New York, NY, US: McGraw-Hill 982-1026.

[9] Mark R. Leary, Kristine M. Kelly, Catherine A. Cottrell and Lisa S. Schreindorfer. 2013. Construct validity of the need to belong scale: Mapping the nomological network. *Journal of Personality Assessment*, 95, 6 (2013), 610-624. DOI: 10.1080/00223891.2013.819511

[10] Kipling D. Williams, Christopher K. T. Cheung and Wilma Choi. 2000. Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology*, 79, 5 (2000), 748-762.

[11] Jessica L. Lakin and Tanya L. Chartrand. 2005. Exclusion and nonconscious behavioral mimicry. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *Sydney Symposium of Social Psychology series. The social outcast: Ostracism, social exclusion, rejection, and bullying*. New York, NY, US: Psychology Press. 279-295.

[12] Karen Gonsalkorale and Kipling Williams. 2007. The KKK won't let me play: Ostracism even by a despised outgroup hurts. *European Journal of Social Psychology*, 37, 6 (2007), 1176-1186. DOI: 10.1002/ejsp.392

[13] Naomi I. Eisenberger, Matthew D. Lieberman and Kipling D. Williams. 2003. Does rejection hurt? An fMRI study of social exclusion. *Science*, 302, 5643 (2003), 290-292. DOI: 10.1126/science.1089134

[14] Jean M. Twenge, Roy F. Baumeister, Dianne M. Tice and Tanja S. Stucke. 2001. If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of personality and social psychology*, 81, 6 (2001), 1058-1069. DOI: 10.1037/0022-3514.81.6.1058

[15] Ginette C. Blackhart, Lisa A. Eckel and Dianne M. Tice. 2007. Salivary cortisol in response to acute social rejection and acceptance by peers. *Biological Psychology*, 75, 3 (2007), 267-276. DOI: 10.1016/j.biopsycho.20007.03.005

[16] Ilja Van Beest and Kipling D. Williams. 2006. When inclusion costs and ostracism pays, ostracism still hurts. *Journal of Personality and Social Psychology*, 91, 5 (2006), 918-928. DOI: 10.1037/0022-3514.91.5.918

[17] Nathan C. DeWall and Roy F. Baumeister. 2006. Alone but feeling no pain: Effects of social exclusion on physical pain tolerance and pain threshold, affective forecasting, and interpersonal empathy. *Journal of Personality and Social Psychology*, 91, 1 (2006), 1-15. DOI: 10.1037/0022-3514.91.1.1

[18] Ginette C. Blackhart, Brian C. Nelson, Megan L. Knowles and Roy F. Baumeister. 2009. Rejection elicits emotional reactions but neither causes immediate distress

nor lowers self-esteem: A meta-analytic review of 192 studies on social exclusion. *Personality and Social Psychology Review*, 13, 4 (2009), 269-309. DOI: 10.1177/1088868309346065

[19] Cynthia L. Pickett, Wendi L. Gardner and Megan Knowles. 2004. Getting a cue: The need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin*, 30, 9 (2004), 1095-1107. DOI: 10.1177/0146167203262085

[20] Anita Smith and Kipling D. Williams. 2004. RU there? Ostracism by cell phone text messages. 2004. *Group Dynamics: Theory, Research, and Practice*, 8, 4 (2004), 291-301. DOI: 10.1037/1089-2699.8.4.291

[21] Ashwini Nadkarni and Stefan G. Hofmann. Why do people use Facebook?. 2012. *Personality and Individual Differences*, 52, 3 (2012), 243-249. DOI: 10.1016/j.paid.2011.11.007

[22] Ethan Kross, Phillippe Verduyn, Emre Demiralp, Jiyoung Park, David Seungjae Lee, Natalie Lin, Holly Shablack, John Jonides and Oscar Ybarra. 2013. Facebook use predicts declines in subjective well-being in young adults. *PloS One*, 8, 8 (2013), e69841. DOI: 10.1371/journal.pone.0069841

[23] Chrisitnea Sagioglou and Tobias Greitemeyer. 2014. Facebook's emotional consequences: Why Facebook causes a decrease in mood and why people still use it. *Computers in Human Behavior*, 35 (2014), 359-363. DOI: 10.1016/j.chb.2014.03.003

[24] Jennifer L. Bevan, Jeanette Pfyl and Brett Barclay. 2012. Negative emotional and cognitive responses to being unfriended on Facebook: An exploratory study. *Computers in Human Behavior*, 28, 4 (2012), 1458-1464. DOI: 10.1016/j.chb.2012.03.008

[25] Tobias Greitemeyer, Dirk O. Mügge and Irina Bollermann. 2014. Having responsive Facebook friends affects the satisfaction of psychological needs more than having many Facebook friends. *Basic and Applied Social Psychology*, 36, 3 (2014), 252-258. DOI: 10.1080/01973533.2014.900619

[26] Michael A. Stefanone, Alaina Iacobucci and Elena Svetieva. 2016 Developing the Network Awareness Construct: Evidence Supporting the Ability to Understand Social Situations. In *Proceedings of the Hawaii International Conference on System Sciences (HICSS 2016)* IEEE: Waikoloa, HI, USA, 1530-1605. DOI: 10.1109/HICSS.2016.256

[27] Richard E. Petty, John T. Cacioppo and Rachel Goldman. 1981. Personal involvement as a determinant of argument-based persuasion. *Journal of personality and social psychology*, 41, 5 (1981), 847-855. DOI: 10.1037/0022-3514.41.5.847

[28] Shannon Greenwood, Andrew Perrin and Maeve Duggan. 2016. Social media update 2016. *Pew Research Center*, 11 (2016), 83.

[29] David Watson, Lee Anna Clark and Auke Tellegen. 1988. Development and validation of brief measures of positive and negative affect: the PANAS scales. 1988. *Journal of Personality and Social Psychology*, 54, 6 (1988), 1063-1070.