

**STAND BY ME: THE PRESENCE OF A CLOSE FRIEND HELPS AGAINST THE  
NEGATIVE EFFECTS OF SOCIAL EXCLUSION**

A Thesis

Presented to the Faculty of the Graduate School  
of Cornell University

In Partial Fulfillment of the Requirements for the Degree of  
Master of Arts

by

Gizem Surenkok Ulutan

August 2014

© 2014 Gizem Surenkok Ulutan

## **ABSTRACT**

Individuals are highly attuned to cues of exclusion, even when it is not caused by an actual social threat. To date there is little evidence identifying the situational factors that could buffer individuals from the detrimental consequences of exclusion. Our study investigated how the presence of a close friend, a potential attachment figure, affects the perception and experience of one-person exclusion. Participants played Cyberball either in the presence of a friend or alone. They were either included by both players or excluded by one player while the other remained fair. Although all excluded participants detected, participants who were excluded in the presence of their friends reported significantly better mood-and-need levels compared to those who participated alone. Individual differences did not moderate the effects. These findings suggest that although it does not affect the perception of social exclusion, the presence of a friend could buffer against the negative effects of exclusion.

## **BIOGRAPHICAL SKETCH**

Gizem Surenkok graduated with B.A degrees in Psychology and Political Science from Bogazici University, Turkey in 2005. After receiving her MBA degree in Koc University, Turkey in 2007 and working for a while, she moved to the United States to pursue her goal of doing a PhD in Psychology. She completed her M.A degree in General Psychology in 2011 and started her PhD program in Developmental Psychology the same year. She is now a 3<sup>rd</sup> year PhD student working with Prof. Vivian Zayas and Prof. Cindy Hazan. Her main research interests are interpersonal relationships and social cognition.

## ACKNOWLEDGEMENTS

I would like to express my deepest appreciation and gratitude to my advisors, Prof. Vivian Zayas and Prof. Cindy Hazan, for their never-ending encouragement, support and invaluable guidance over the past years. Thanks to their patience and mentoring, I have learned so much as a researcher and as an individual.

I would like to thank all my undergraduate research assistants who were involved in this research but my special appreciation goes out to Jessica Lerman and Frederico De Paoli, who worked really hard and played a big role in facilitating data collection for this thesis.

I cannot feel grateful enough for the endless love, support, care and concern my wonderful family has always provided for me. My mom – I have always found strength in your love. My friends here and back in Turkey – thank you all for being so supportive and caring. Nadia Chernyak and Carissa Kang – thank you for always being there for me.

Finally, I would like to thank my loving husband, Durul Ulutan, for being my cornerstone. He raised me up to more than I can ever be. Without his love and encouragement, none of this would have been possible.

## TABLE OF CONTENTS

<b>Introduction.....</b>	<b>1</b>
i. Current Study.....	8
<b>Method.....</b>	<b>10</b>
i. Participants.....	10
ii. Design.....	10
iii. Procedure and Materials.....	10
<b>Results.....</b>	<b>17</b>
i. Manipulation check: Did participants perceive being excluded or included?.....	17
ii. Did the presence of the friend buffer against the negative effects of one-person exclusion?.....	19
iii. IIE: Was the includer perceived as a part of the exclusion?.....	21
iv. Did individual differences moderate the effects?.....	24
<b>Discussion.....</b>	<b>26</b>
i. Alternative explanation for the buffering effect.....	28
ii. Interpreting the existence of IEE in the presence of a close friend.....	28
iii. Interpreting the lack of moderation by individual differences.....	29
iv. Implications and Future Directions.....	29
<b>References.....</b>	<b>31</b>
<b>Appendix.....</b>	<b>40</b>

**LIST OF FIGURES**

Figure 1: Comparison of perceptions across conditions.....18

Figure 2: Comparison of composite mood and needs across conditions.....20

Figure 3: Comparison of ball tosses from includer across conditions.....23

## LIST OF TABLES

Table 1: Correlations between composite mood and needs and individual differences

measures.....24

## Introduction

Imagine that you are at a cocktail party with unfamiliar people. Although you try to get involved in other people's conversations, they seem reluctant to include you. After a few unsuccessful attempts, you perceive that you are excluded and start to feel alone and unhappy. Your sense of self-worth is diminished.

Let's rewind this scenario and imagine that you attend the same party with your best friend this time. You experience the same type of exclusion, but now you know that your friend is somewhere around – maybe just getting some drinks for you two. How would you feel in such a situation? Would you still feel alone and unhappy? Would you even perceive that you are getting excluded by strangers? Is the presence of your friend enough to buffer against the negative consequences of being excluded by others? Or would the presence of your friend help you recover faster even though you experience the exclusion?

Important social groups and significant others are fundamental to well-being and survival (Baumeister & Leary, 1995). Being excluded from these social groups has immediate detrimental effects on physical and psychological well-being. From an evolutionary perspective, belonging to a group brings survival benefits. In our ancestral hunter-gatherer past, group membership brought valuable resources, such as access to shelter and food as well as access to mates. Back in this ancestral past, if a person was no longer a member of their social group, they could lose access to these resources and their survival would decrease. Cues of social exclusion, therefore, were particularly important to read because quickly detecting and responding to threats to inclusion would lead to better conditions for survival (Spoor & Williams, 2007). It has been argued that human beings have evolved to have a very powerful psychological mechanism – the “ostracism detection system” that allows them to detect any signs that they may be excluded.

This system is quick and oversensitive in its nature. Evolutionarily, over-detection is a useful feature of this system. The quicker individuals detected exclusion from the social group, the faster they could make amends with the group and thus the better they were able to survive.

This inherited ostracism detection system is what makes individual highly attuned to cues of exclusion. This system is so powerful and sensitive that it goes off indiscriminately to any cues of exclusion. Thus, individuals feel the negative effects of ostracism when they are excluded by characters generated by the computer program (Zadro, Williams & Richardson, 2004) or members of disliked groups (Gonsalkorale & Williams, 2007). Moreover, individuals are hurt when they are unintentionally excluded (Eisenberger, Lieberman & Williams, 2003) or when getting included is financially more costly (van Beest & Williams, 2006). The ostracism detection system “functions much like touching a flame—it triggers pain and coping regardless of the context, the source of ostracism, or that source’s motives” (Kerr & Levine, 2008, p. 48). Gonsalkorale and Williams (2007) argue that the effects of ostracism is so overwhelming that individuals are unable to pay attention to other information during the course of exclusion. For all these reasons, it is very difficult to prevent individuals from perceiving and responding to the cues of social exclusion.

The power of this system and how people respond to social exclusion have been explored using a variety of methods including an actual ball throwing game (Williams, 1997), role playing (Williams, Bernieri, Faulkner, Gada-Jain, & Grahe, 2000), chat rooms (Gardner, Pickett, & Brewer, 2000), text messaging (Smith & Williams, 2004) and others (Baumeister, Twenge, & Nuss, 2002; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997; Pickett, Gardner, & Knowles, 2004; Twenge, Baumeister, Tice, & Stucke, 2001). More recently, a virtual ball game, Cyberball, has been developed as a robust paradigm to manipulate ostracism (Williams, Cheung, & Choi,

2000). In this online ball throwing game, participants are told that they are playing the ball game against two other people, who are connected over the Internet and located in another room. Depending on their randomly assigned condition, participants are either excluded as the other players stop throwing the ball to them and continue to play the game with each other, or included as the other players throw the ball to them and each other about an equal number of times.

Studies using Cyberball and other exclusion methods reliably showed that being excluded from important groups has detrimental effects on well-being and functioning. The immediate negative responses to social exclusion include, but are not limited to increased negative affect (Williams & Zadro, 2005), impaired self-regulation and motivation (Baumeister et al., 2002; Twenge, Catanese and Baumeister, 2002), aggressiveness (DeWall, Twenge, Gitter, & Baumeister, 2009), coldness (Zhong & Leonardelli, 2008), and threatened fundamental needs (i.e., the need to belong, the need to maintain a high self-esteem, the need to have control over one's social environment and the need to feel recognized. For a review, see Williams, 2009). Severe forms of social exclusion (e.g., future-life exclusion paradigm) have been found to cause numbness (DeWall & Baumeister, 2006) whereas less severe cases result in hypersensitivity to pain (Eisenberger et al., 2003; for a discussion about this distinction, please see Bernstein & Claypool, 2012). Prolonged exclusion is linked to maladjustment, and poor mental (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006) and physical health (Cacioppo & Hawkley, 2003). In such situations, people who are exposed to prolonged exclusion can develop a world-against-me mindset and view the whole world as threatening (Cacioppo & Hawkley, 2005). These people may become chronically hostile, detached and lonely.

Social exclusion has been consistently found to be one of the most socially painful experiences (Williams, 2007). It causes individuals to feel less valued as a relational partner in

the group (i.e., relational devaluation) and hence experience hurt feelings (Leary, Springer, Negel, Ansell, & Evans, 1998). It is evident that this psychological hurt could be as sharp and painful as a bodily injury, sometimes lasting even longer. Extensive research has revealed that the painful effect of exclusion is quite similar to physical pain indicating that the social and physical pain systems are connected (Bernstein & Claypool, 2012). The social pain arising from actual or potential social threats is processed in the same brain regions that process physical pain associated with actual or potential tissue damage (Eisenberger & Lieberman, 2005). Because the systems for detecting and processing physical and social pain overlap, the responses to physical and social pain are usually very similar (MacDonald & Leary, 2005).

Because of this overlap in processing social and physical pain, one could predict that the buffering factors that are effective in responses to physical pain should also work in response to social pain. It is well established that social support is an effective buffer when people experience acute physical pain. Specifically, it has been found that social support was significantly associated with lower levels of pain during childbirth (Cogan & Spinnato, 1988; Hodnett, 2000; Niven, 1985), cardiac pain (Chalmers, Wolman, Nikodem, Gulmezoglu, & Hofmeyer, 1995), chronic pain (Phillips & Gatchel, 2000), and pain after coronary bypass surgery (Lidderdale & Walsh, 1998).

Research has also shown that social support could serve as a strong buffer against socially painful or stressful situations. For instance, feelings of belongingness and higher peer acceptance were found to be important buffers against the negative effects of loneliness (Baskin, Wampold, Quintana, & Enright, 2010). Another study revealed that support from friends could protect adolescents from the negative consequences of loneliness on academic performance (Benner, 2010). Social support at workplace also found to be highly related to job control, low

depression and better job performance (Park, Wilson, & Lee, 2004). Moreover, simply viewing the photographs of attachment figures helped participants recover faster after recalling upsetting memories (Selcuk, Zayas, Gunaydin, Hazan, & Cross, 2012). The protective function of social support was observed even when it was provided by a stranger. When married women were scanned to see if holding hands with their spouse or a stranger would reduce their threat perception of an anticipated shock, it was found that social contact led to significantly reduced threat response. Although it was most pronounced in spousal handholding condition in women with the highest quality relationships, holding a stranger's hand was also helpful (Coan, Schaefer, & Davidson, 2006).

Why is social support this important especially when provided by close others?

According to attachment theory, close others could serve as a safe haven providing a source of comfort from distress and facilitating affect regulation (Bowlby, 1988; Diamond & Hicks, 2004; Harlow, 1958).

Accordingly, when an individual feels distressed – as a result of appraising the environment as threatening or the self as in need of help -, she seeks proximity to her attachment figure. An available and responsive attachment figure could then alleviate the distress and restore emotional and physiological balance within the individual. The importance of attachment figures in providing support and reassurance in times of distress is well established in relationships research. Individuals seek to feel comforted and soothed by either the actual presence or just the mental representations of significant others (Mikulincer & Shaver, 2007). By providing a sense of security and safety (also known as “felt security”; Sroufe & Waters, 1977), attachment figures play an important role in affect regulation. Previous studies have provided evidence that actual or anticipated interactions with responsive attachment figures alleviate distress experienced due to

external and internal stressors (Coan et al., 2006; Eisenberger et al., 2011; Master, Eisenberger, Naliboff, Shirinyan, & Lieberman, 2009; Selcuk et al., 2012).

Mikulincer and Shaver (2007) explained the mechanism behind the activation of attachment system under stress in three steps. First, individuals appraise their environment and detect threatening stimuli. Then, they evaluate availability of their attachment figures and become relaxed if they can get protection and comfort from an attachment figure. Finally, if their attachment figure is unavailable or unresponsive, they either try harder to secure comfort from the attachment figure or they give up and rely on themselves.

Although social exclusion is a very painful situation, surprisingly, very few studies investigated the potential mitigating effect of social support and feelings of belongingness on the negative consequences of social exclusion (for exceptions, see Aydin et al., 2012; Chernyak & Zayas, 2010; Tai, Zheng, & Narayanan, 2011; Teng & Chen, 2012). Moreover, to date, no study has investigated whether activating the mental representation of an attachment figure confers regulatory benefits in response to experiencing a social exclusion situation. A related question, which has not even asked before in the realm of social exclusion, is whether the affect regulation benefits of an attachment figure would depend on whether the representation is activated before or after experiencing social exclusion.

Based on attachment theory, attachment figures should help with the down-regulation of negative affect regardless of whether the representation is activated before or after the occurrence of a stressor – in our case, social exclusion. If the mental representation is activated before the stressor, it would automatically activate positivity (e.g., Zayas & Shoda, 2005) and lead to feelings of safety and belonging. This could decrease the extent to which the event is appraised as stressful, or a person's reactivity when recalling the event, and thus, decrease the

negative affect. This buffering effect is observed in several studies (e.g., Ditzen et al., 2007; Grewen et al., 2003; Kamarck, Manuck, & Jennings, 1990), but failed to be found in some others (e.g., Selcuk et al., 2012).

If the mental representation is activated after the stressor, the positivity and feelings of calmness and belonging could promote recovery and help individuals return to their affective baseline more quickly. This recovery effect is also observed in several studies (e.g., Collins & Feeney, 2000; Selcuk et al., 2012)

In contrast to the assumptions of attachment theory, Gross's (1998, 2001) work on emotion regulation suggests that timing of an affect regulation strategy is important to determine its success. His work on reappraisal and suppression highlights the importance of timing in not only determining the effectiveness of the strategy but also the outcomes (Gross, 2001).

Within the limited number of studies exploring the potential sources of support in social exclusion situations, one study revealed evidence for the buffering theory, but only for individuals with high self-esteem (Teng & Chen, 2012). They investigated whether the presence of a close friend (vs. a stranger) could mitigate the negative effects of social exclusion. Participants were either ostracized or included in the presence of a stranger or a close friend. Presence of a close friend buffered only high self-esteem participants from the detrimental effects of exclusion while it did not work for low self-esteem participants. In another study, Chernyak and Zayas (2010) looked at the buffering effect of a fair, inclusive person in the situation, but failed to find such an effect. The findings suggested that participants still perceived exclusion even in the presence of an inclusive other and suffered from lessened belongingness. Moreover, instead of perceiving the fair person as a source of social support, they perceived them as a part of the exclusion. Although this finding is unexpected considering the

social support literature, social pain is known to be very sharp and incapacitating (MacDonald & Leary, 2005) making individuals unable to attend to other cues in the situation except cues of social exclusion (Sporer & Williams, 2007). Moreover, because participants perceived a greater relationship between the fair person and the excluder, it is possible that their construal of the fair person's behavior was colored by this inference.

In two other studies, a companion dog and a teddy bear were used to help participants recover faster from the negative effects of exclusion (Aydin et al., 2012; Tai, Zheng, & Narayanan, 2011). In the study conducted by Aydin and colleagues (2012), a companion dog was brought to the room right after participants played Cyberball alone. Excluded participants who completed the self-reports in the presence of a dog reported higher life satisfaction, higher self-esteem and more positive emotions compared to excluded participants who completed these measures alone. In Tai and colleagues' (2011) study, participants were manipulated to feel excluded or included using two different exclusion methods. Excluded participants who touched a teddy bear after the exclusion manipulation acted more prosocially in a later task than excluded participants who just looked at the teddy without touching.

Albeit being very important, these studies focused on social support in general and did not provide a mechanism behind the observed effects. We aimed to fill this gap in the literature with the present study.

### **Current Study**

Is it possible to mitigate the social pain of social exclusion by the presence of a close friend, a potential attachment figure? Would the physical presence of the friend serve to either preemptively protect individuals from the negative effects of exclusion or would it help in the reparation of mood following the effects of exclusion? This work is a part of a larger project,

which provides the first systematic examination of whether activating the mental representation of a friend helps with the regulation of affect triggered by social exclusion situations and if so, when the ideal timing of this activation should be.

In this experiment, we used close friends as attachment figures and tested the affect regulation role of close friendships. Hazan and Zeifman (1994) argued that attachments are transferred from parents to peers in adolescence and that peers could serve as a safe haven in this period. As our sample is composed of college-age students, we assumed that close friends could still serve as a safe haven in our sample. All of our participants took part in a virtual ball-tossing game, in which they were either excluded by one of the players or included by both players. Some of the participants played the game in the presence of their close friends whereas other participants participated alone. The participants who participated with their friends received a reminder about the presence of their friend right after the ball-game. Our aim was to activate the mental representation of the friend right after the social exclusion situation to test the recovery effect. In line with the past research that has reliably shown that social support could protect individuals from negative consequences of social threats, excluded participants in the presence of their friends were expected to report better mood and fundamental need levels than excluded participants who participated alone. We hypothesized that the presence of the friends would not prevent our participants from perceiving the exclusion (hence no buffering) but they would feel the negative effects on mood and needs to a lesser extent.

We also wanted to explore how individual differences moderated the effect of the presence of the friend. There is a huge body of research showing that certain personality factors are linked to stronger sensitivity to exclusion such as rejection sensitivity (Downey & Feldman, 1996), insecure attachment (Hazan & Shaver, 1987), low self-esteem (Leary & Baumeister,

2000) and chronic loneliness (Hawkley & Cacioppo, 2010). Although previous research has failed to reveal evidence that individual differences moderate responses to ostracism during and immediately after the episode, it is possible that individual differences could affect how people cope with these negative effects (Williams, 2007). For example, Zadro, Boland and Richardson (2006) showed that the effects of ostracism were more persistent for socially anxious individuals. Moreover, previous research suggested that certain individual differences could moderate the effect of social support. Specifically, in the study Teng and Chen (2012) reported, the buffering effect of friends was only observed in participants with high self-esteem.

To explore this possibility, we included several individual differences measures such as self-esteem, rejection sensitivity, attentional control, personality dimensions and attachment styles that could potentially moderate the effect of social exclusion or the buffering effect of social support participants get from the presence of their friends. However, based on the strong effect of social support, we predicted that participants would benefit from the presence of their friends regardless of their individual differences. .

## **Method**

### **Participants**

One-hundred-eighty-one ( $M$  age = 20.55; 65.2% female; 60.22% White, 25.41% Asian, 9.39% Black/African American, 4.97% Other) students at Cornell University participated in this experiment and were compensated with cash or extra credit in a course. Friend pairs and individuals were recruited separately in consecutive semesters. Although the participants in friend pairs were found to be significantly higher in extraversion, agreeableness, rejection sensitivity, self-esteem and attachment security compared to the participants who participated alone, these individual differences did not have an effect on our results.

## Design

This experiment employed a between-subjects design with two overarching conditions: friend status (present vs. absent) and inclusion status (one-person exclusion vs. inclusion by all).

## Procedure and Materials

**Overview.** Before the experimental session in the lab, all participants filled out an online pretest, which included several individual differences measures. Upon their arrival at the lab, all participants were told that their task was to play an online ball game (i.e., Cyberball: Williams et al., 2000) and complete some questions before and after the game. Inquisit 3.0.5.0 (Inquisit, 2010) was used to create the ball game. All participants were informed that they would be playing the ball game with two other participants who were located in another room. In reality, the other players did not exist and they were only preprogrammed on the game to engage in inclusion or exclusion. After all the participants were seated and asked to sign a consent form, the experimenter left the room for 2 minutes to “check on the other players.” Upon the experimenter’s return, participants were told that they could start playing the game. Participants were not able to see each other’s computer screens as each cubicle were separated by partitions. Although friend pairs sat right next to each other, they were also unable to see what the friend was doing or even going through the same experiment.

Participants were randomly assigned to either a *friend-present* condition or a *friend-absent* condition. Within each of these conditions, participants were then randomly assigned to either an *one-person exclusion* or *inclusion* group. In the *inclusion* condition, both pre-programmed players threw the ball 50% of the time to the participant and 50% of the time to the other player. In the *one-person exclusion* condition, one of the players (excluder) never threw the

ball to the participant while the other player (includer) remained fair throwing the ball 50% of the time to the participant and 50% of the time to the other player.

After playing Cyberball, participants completed the mood measures and a short questionnaire about their recollection of the ball game. All participants in the *friend-present* condition were reminded throughout the experiment that they would soon interact with their friend. At the end of the experiment, participants completed a demographics form. They were then probed for suspicion, debriefed on the purpose of the study, and thanked for their time.

**Measures. *Online pretest.*** Participants completed an online pretest before coming to the experimental session. Participants in both *friend-present* and *friend-absent* conditions completed measures consisting of the Rosenberg Self-Esteem (RSE) Scale (Rosenberg, 1989); the 10-item version of the Big Five Inventory (BFI) (Rammstedt & John, 2007); 8 of the 18 items of the Rejection Sensitivity Questionnaire (RSQ) (Downey & Feldman, 1996) that are specifically selected as relevant to rejection in friendships, due to time concerns; and Attentional Control Scale (ACS; Derryberry & Reed, 2002). Among these measures, BFI-10 is a 10-item scale measuring personality domains of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience. The RSE scale assesses global self-esteem, a person's general evaluation of her own worth. It also has 10 items and uses a 5-point scale. RSQ measures individuals' sensitivity to rejection and originally has 18 items. Lastly, ACS is used to measure individuals' ability to shift their attention from threatening information to more positive thoughts. We explored if this ability would make an effect on how participants would feel after social exclusion in the presence of their friends.

In addition to these questions, participants in the *friend-present* condition completed questions about their relationship with the friend, with whom they were participating in the

study. In this part, participants were asked to report about how long they had been close friends with each other, how frequently they met in person or talk on the phone and whether they lived together or not. They also answered a questionnaire designed to measure the perceived closeness in the friendship. This questionnaire consisted of questions about familiarity and significance of the friend, closeness to the friend, the feelings of positivity and negativity toward the friend, and the “inclusion of other in the self” questionnaire (IOS; Aron, Aron, & Smollan, 1992), for which participants were shown seven Venn diagrams with varying degrees of overlap between the self and the friend and then asked to choose the diagram that best represented their relationship with their friend. The Cronbach’s alpha for the questionnaire was .801 but further analysis indicated that the exclusion of negativity item could increase the Cronbach’s alpha to .869. Therefore, a composite score composed of familiarity, closeness, significance, positivity and IOS was used to represent this scale. ,.

***Measuring attachment styles.*** Although all the other individual differences measures were included in the pretest, attachment styles were measured at the beginning of the experimental session following the advice by Baldwin and Fehr (1995). The authors argued that because adult attachment styles show a degree of instability, researchers should aim to administer attachment measures around the same time with other dependent measures. We assessed participants’ adult attachment style using a 10-item version of the Experiences in Close Relationships - Revised (ECR-R; Fraley, Waller, & Brennan, 2000) questionnaire developed by Zayas, Mischel, Shoda and Aber (2011). Previous studies showed that this version has a strong internal reliability and construct validity (Selcuk et al., 2012; Zayas et al., 2011). This version consists of 10 items, 5 of which are for relational anxiety and the other 5 for relational avoidance. In the *friend-present* condition, the wording of these items was carefully revised to

ensure that we could assess the adult attachment style in relation to the close friend our participants were participating with. In the *friend-absent* condition, participants' general attachment styles were measured.

***Manipulating inclusion vs. exclusion.*** Participants were asked to play Cyberball after they completed the ECR. In both *inclusion* and *one-person exclusion* conditions, two silhouetted avatars were shown to represent the other players, labeled "Terry" and "Pat" (specifically chosen so that they do not indicate a certain gender). Participants were told that all the players in the game were given pseudo-names to protect their confidentiality. An avatar labeled "You" represented the participant at the lower-center of the screen. All participants were instructed to use the mouse to click on the avatar of the player they wanted to throw the ball to. Past research by Chernyak and Zayas (2010) showed that one-person exclusion in Cyberball was enough to create feelings of exclusion as it led to diminished feelings of self-worth and lessened belongingness.

***Measuring emotion through mood and needs.*** We assessed feelings of belongingness ("*disconnected/connected*," "*I belong/I don't belong*," "*like an outsider/like an insider*"), awkwardness ("*uneasy/easy*," "*comfortable/uncomfortable*," "*awkward/not awkward*"), control ("*powerless/powerful*," "*I have control/I lack control*," "*uninfluential/influential*") and mood ("*sad/happy*," "*friendly/unfriendly*," "*angry/pleasant*") by using a 12-item questionnaire with a 7-point scale. This questionnaire was administered right after the Cyberball. Past research provided evidence that after being excluded, participants reported feelings of diminished belongingness, lessened control, depressed moods (Chernyak & Zayas, 2010; Kipling, Cheung, & Choi, 2000; Zadro, Williams, & Richardson, 2004) and increased awkwardness (Anderson & Zayas, in preparation; Ho, Surenkok, & Zayas, 2014). Self-esteem and meaningful existence are

also revealed to be affected by social exclusion (Kipling, Cheung, & Choi, 2000; Zadro, Williams, & Richardson, 2004) but for the sake of brevity, we did not include them in our mood and needs measure. Moreover, Gerber and Wheeler (2009) found in their meta-analysis that among the threatened needs, social exclusion impaired belonging and control more than the others. Because the Cronbach's alpha was above .75 for each subscale and equal to .86 for the composite scale, a single composite score was calculated to represent all mood and needs items (will be named "composite mood and needs" from now on) in further analyses. Analysis examining the four individual scales produced similar results.

***Measuring perceptions of the includer's and excluder's behaviors.*** A short questionnaire was included to assess participants' recollection of Cyberball. We aimed to see if our participants were aware of the social dynamics in the game. Specifically, participants were asked to estimate the percentage of the ball tosses they received from the other players, Terry and Pat, over the course of the game as well the percentage of ball tosses they threw to the other two players. What we investigated was whether participants in the *one-person exclusion* condition reported that the excluder had thrown the ball to the fair person more often while the participants in the inclusion condition reported receiving the ball about an equal percentage as the other players.

**Manipulation checks and suspicion probe.** The assessment of our participants' awareness of the social dynamics was also used as a manipulation check for the experiment. In addition to that, participants were probed for suspicion after completing the experiment using specifically designed questions. These questions included close and open-ended questions such as "Was there anything at all suspicious or unusual about this experiment?", "Have you ever participated in an experiment similar to any part of this one?" and "Do you have any guesses

about what we're trying to study?". None of the participants could guess the specific hypotheses of the experiment. However, 54 of the 181 participants reported suspicion or knowledge that the ball game was intended to make them feel excluded or included (8 included and 15 excluded in the friend-present condition, 13 included and 18 excluded in the friend-absent condition). The analyses were rerun excluding these participants who reported suspicion or knowledge about Cyberball, and the results remained relatively unchanged from those based on the entire sample (please see the Appendix for the results of these analyses). Moreover, reporting suspicion did not moderate the effects of exclusion in the friend-absent condition or the effects of the presence of a friend in the friend-present condition.

**Data analytic strategy.** One of the goals of the data analytic strategy was to check whether the exclusion manipulation worked and our participants were able to realize the social dynamics that they were exposed to in the game. With this aim, independent samples t-tests were applied to see whether participants in the *one-person exclusion* condition reported receiving the ball to a much lesser extent compared to the participants in the *inclusion* condition regardless of the presence or absence of the friend. Then, general linear models (GLMs) were used with the presence vs. absence of the friend and exclusion vs. inclusion conditions as between-subjects factor for the primary manipulation check (the averaged percentage of the ball throws participants reported receiving from the other players). A second goal was to quantify the extent to which exclusion manipulation affected the mood and fundamental needs of participants compared to inclusion manipulation in the presence or absence of a friend. With this goal in mind, general linear models (GLMs) were used with the presence vs. absence of the friend and exclusion vs. inclusion conditions as between-subjects factors for the primary dependent measure (composite mood and needs). Another goal of the data analytic strategy was to measure the

extent to which the includer (the fair person in the ball game) was perceived as an excluder in different conditions (friend present vs. friend absent). One-sample t-tests were performed to assess whether the difference between the actual percentage of ball tosses and the estimated percentage of ball tosses from the includer was significantly different from zero. A mixed model was used to measure whether this difference varied significantly across friend present and friend absent conditions and across inclusion and one-person exclusion conditions. Finally, individual differences were used as covariates in GLMs where the presence vs. absence of the friend and exclusion vs. inclusion conditions were entered as between-subjects factors to explore whether individual differences moderated any of the effects found.

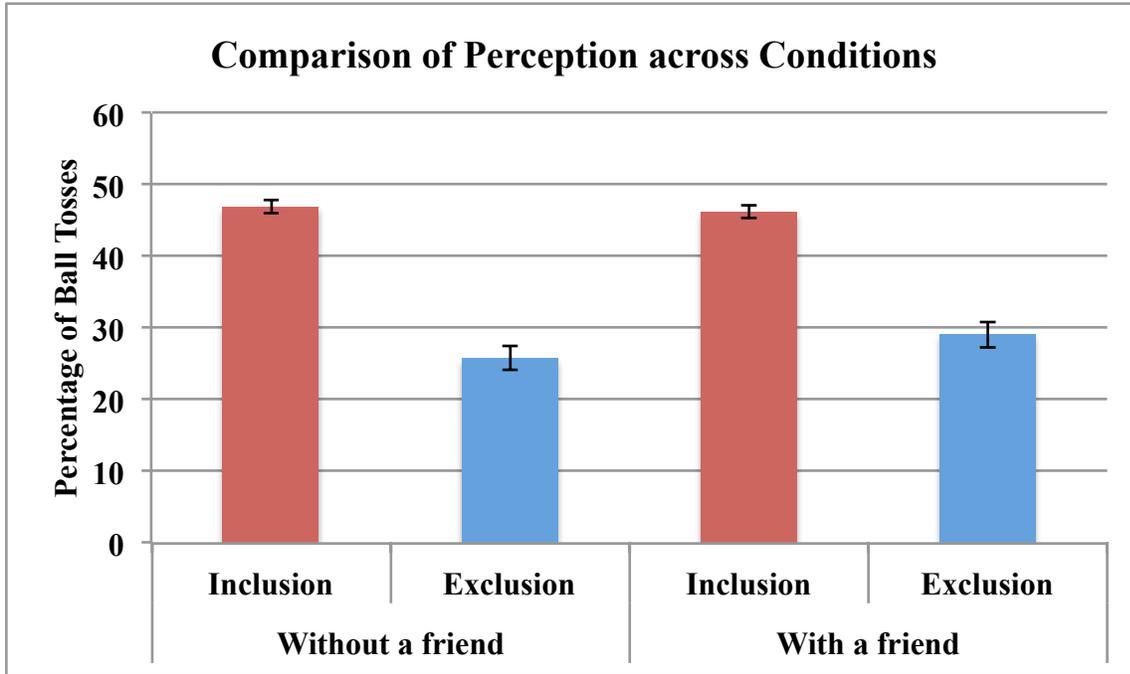
## Results

### **Manipulation check: Did participants perceive being excluded or included?**

Replicating past work using Cyberball, participants correctly perceived when they were being excluded or included in the game, as shown by their averaged estimations of the percentage of ball tosses that they received from the other players (One-person exclusion:  $M = 27.46\%$ ,  $SD = 11.46$ ; Inclusion:  $M = 46.54\%$ ,  $SD = 5.86$ ).<sup>1</sup> A GLM in which the presence of the friend and the inclusionary condition were entered as between-subjects factors for the averaged estimation of the percentage of ball tosses revealed that only the inclusionary condition had a main effect on this averaged estimation,  $F(1,174) = 200.75$ ,  $p < 0.001$ ,  $\eta_p^2 = .54$ . The presence of the friend, however, did not have a main effect on the averaged estimation of the percentage of ball tosses,  $F(1, 174) = 2.20$ ,  $ns$ ,  $\eta_p^2 = .01$ . The interaction between the two independent factors was also non-significant,  $F(1, 174) = 1.04$ ,  $ns$ ,  $\eta_p^2 = 0$  (see Figure 1).

---

<sup>1</sup> 3 participants were excluded from all the analysis related to perception of inclusionary status as they confused which player was the fair person and which player was the excluder. They are all in exclusion condition. Two of them are in the *friend-absent* condition and one of them is in the *friend-present* condition.



*Figure 1.* Participants' averaged estimations of the percentage of ball tosses from the other two players in all study conditions. Bars represent one standard error.

### **Did the presence of the friend help against the negative effects of one-person exclusion?**

A GLM in which the presence of the friend and the inclusionary condition were entered as between-subjects factors revealed that the presence of the friend had a significant main effect on composite mood and needs,  $F(1, 177) = 10.56, p = .001, \eta_p^2 = .06$ . When participants were in the presence of their friends, they reported better composite mood and needs irrespective of their inclusionary status in the game (Friend-present:  $M = 4.96, SD = 0.82$ ; Friend-absent:  $M = 4.53, SD = 0.99$ ). The social inclusionary status (inclusion vs. exclusion) also had a significant main effect on composite mood and needs,  $F(1, 177) = 9.90, p = .002, \eta_p^2 = .05$ . Excluded participants reported worsened composite mood and needs than included participants irrespective of the presence of their friend (One-person exclusion:  $M = 4.55, SD = 1.08$ ; Inclusion:  $M = 4.95, SD = 0.70$ ). The interaction between the two independent factors was also significant,  $F(1, 177) = 13.24, p < .001, \eta_p^2 = .07$  (see Figure 2). This effect was primarily driven by a significant difference in the affect reported by the excluded participants in the *friend-absent* condition and the excluded participants in the *friend-present* condition (Friend-present:  $M = 4.99, SD = 0.88$ ; Friend-absent:  $M = 4.11, SD = 1.08, t(86) = 4.18, p < .001, d = .89$ ). In other words, in line with our hypothesis, the presence of a friend was able to help individuals feel better against the negative affective consequences of social exclusion.

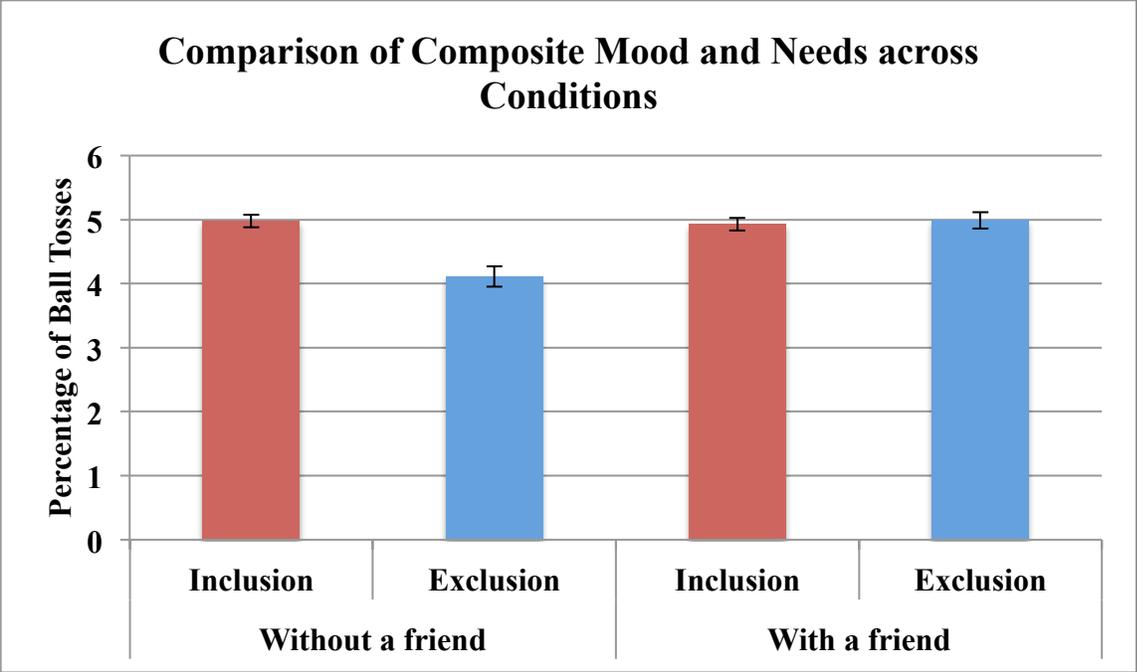


Figure 2. Participants' reported composite mood and needs in all study conditions. Bars represent one standard error.

### **III: Was the includer perceived as a part of the exclusion?**

The fair person (includer) was pre-programmed to throw the ball to the participant and the other player in the game an equal amount of time. However, past research has shown that the fair person was perceived as an excluder probably due to the over-sensitive ostracism detection system. To test whether this effect was still observed in our study, we subtracted the estimated percentage of ball tosses participants reported (35.45%) from the actual percentage of ball tosses participants received from the fair person (50%)<sup>2</sup>. A one-sample t-test assessing whether this score was significantly different from zero showed that it was,  $t(84) = 10.10, p < .001, d = 1.1$ . To compute this score in the inclusion condition, we calculated the average of the estimated percentage of ball tosses received from both players because both players were fair players in this condition. When we subtracted this score (45.48%) from the actual percentage (50%) and assessed whether this score was significantly different from zero, we found that this score was also significantly different,  $t(92) = 5.62, p < 0.001, d = .58$ . Although the effect size for this difference is much smaller, this finding is still interesting. However, for the purposes of this study, the more important question was whether this difference differed significantly across conditions. A GLM in which the presence of the friend and the inclusionary condition were entered as between-subjects factors for the averaged difference between the estimated and the actual percentage of ball tosses received from the fair person revealed that only the inclusionary condition had a main effect on this difference,  $F(1, 174) = 38.42, p < 0.001, \eta_p^2 = .18$ . The presence of the friend, however, did not have a main effect on the averaged difference between the estimated and the actual percentage of ball tosses received from the fair person,  $F(1, 174) = .286, ns, \eta_p^2 = 0$ . The interaction between the two independent factors was also non-significant,

---

<sup>2</sup> Although it was possible for the actual percentage of ball throw from the fair person to vary a little from one person to another (between 49-51%), it was always around 50%. Therefore, we used 50% as our actual percentage in our analyses.

$F(1, 174) = 0, ns, \eta_p^2 = 0$  (See Figure 3). These findings suggest that participants in one-person exclusion condition inaccurately recalled that the fair person in the game had also excluded them to a certain extent.

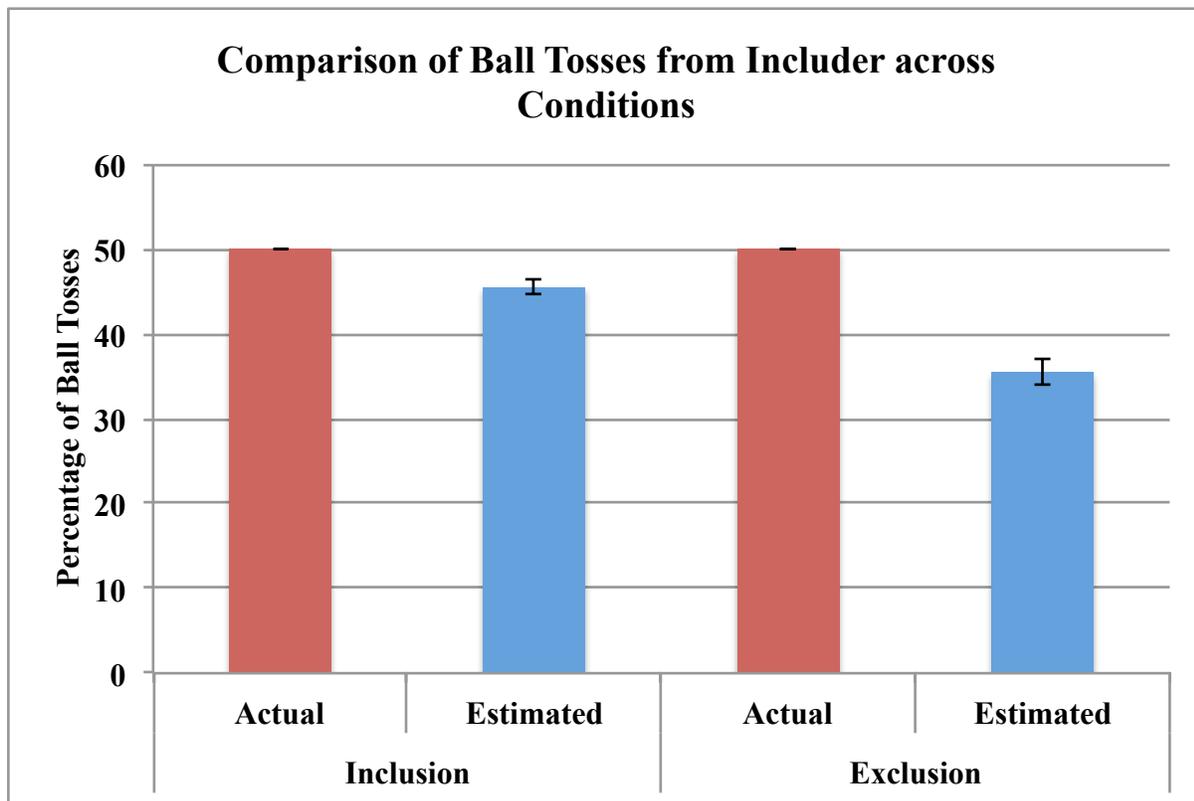


Figure 3. Actual vs. estimated percentage of ball tosses received from the includer as a function of inclusionary condition (inclusion vs. exclusion). Bars represent 1 standard error.

### Did individual differences moderate the effects?

Our analyses showed that all the individual differences except agreeableness and openness were significantly correlated with composite mood and needs regardless of the condition the participant was in (see Table 1).

Table 1

*Correlations between composite mood and needs and individual differences measures*

	Composite Mood and Needs
<b>BFI Dimensions</b>	
Extraversion	.27*
Agreeableness	.10
Openness	.10
Conscientiousness	.32*
Neuroticism	-.23*
<b>Other Individual Differences</b>	
Rejection Sensitivity	-.23*
Self-Esteem	.32*
Attachment Anxiety	-.34*
Attachment Avoidance	-.30*
Attentional Control	.24*

*Note.* \*Correlation significant at the 0.01 level (2-tailed).

However, based on the GLMs in which the presence of the friend and inclusionary status were entered as between-subjects factors and separate individual differences measures as covariates, individual differences failed to provide a reliable moderation for the effects of exclusion. Moreover, the lack of significant 3-way interactions indicated that individual differences did not reliably moderate the buffering effect of the presence of the friend. However, one must be careful in interpreting this null finding because interaction effects are notoriously weaker than main effects and our sample size of 181 provides only about 30% power to detect a medium effect size.

Finally, for the *friend-present* condition, the perceived closeness scale was explored as a potential moderator but failed to reliably moderate the buffering effect of the friendship  $F(1,93)=1.47, ns, \eta_p^2 = 0.2$ .

## Discussion

Although how people immediately respond to the negative effects of social exclusion is well established, there is limited research investigating the potential factors that could buffer individuals from these deleterious effects or help them recover faster once they experience social exclusion. This work is a part of a larger project, which provides the first systematic examination of whether activating the mental representation of a friend helps with the regulation of affect triggered by social exclusion situations and if so, when the ideal timing of this activation should be. In the present work, we used close friends as attachment figures and tested the affect regulation role of close friendships in a social exclusion situation.

In this experiment, we used close friends as attachment figures and explored whether the presence of a close friend would be a protective factor in the face of exclusion. In addition to the physical presence of the friend, we also used reminders to activate the mental representation of

the friend in our participants' minds. Our aim was to activate the mental representation of the friend right after the social exclusion situation to test the recovery effect. Using the paradigm developed by Zayas and Chernyak (2010), participants were randomly assigned to play Cyberball either with two including players (inclusion condition) or with one excluding and one including player (one-person exclusion). Within these conditions, participants were also randomly assigned to play the game either in the presence of their friends or alone.

Based on the previous literature, all participants were expected to correctly perceive their inclusionary status in the game regardless of their condition. However, the participants who were excluded in the presence of their friends were expected to report better mood and need levels compared to the participants who got excluded alone. It was predicted that this buffering effect would only extend to the mood and need levels but not the perceptions of the game. Research on social exclusion shows that the ostracism detection system is so powerful that all individuals are very (sometimes over) sensitive to the cues of exclusion. Therefore, we expected our participants to correctly notice the exclusion in the game. However, social support literature suggests that even though people are exposed to the same pain (social or physical), how they perceive the pain (not the dynamics) could be different when they are accompanied by close others or when the mental representations of close others are activated by the help of a picture or reminders (Coan et al., 2006; Selcuk et al., 2012). In other words, the intensity of the pain (in this case, the social pain) could be different when people are in the presence of their friends. For that reason, we expected our participants who were in the presence of their friends to feel the negative effects of social exclusion to a lesser extent compared to the participants who participated alone. In addition to these predictions, excluded participants were also expected to perceive the fair person in the game as a part of the exclusion. This prediction is in line with past research which has

shown that people are quick to assume that a fair person in a social exclusion situation is an ally of the excluder (Chernyak & Zayas, 2010). Lastly, all these effects were anticipated to be observed in all the participants overshadowing any individual differences.

In line with expectations, the findings suggest that although participants correctly perceived to be excluded in both *friend-present* and *friend-absent* conditions, excluded participants who participated alone felt significantly worse than excluded participants who were in the presence of a close friend. Excluded participants in the *friend-present* condition felt almost as good as participants in the included condition indicating that the presence of a friend buffered individuals from the immediate negative effects of social exclusion. This buffering effect, however, did not change the misperception in the one-person exclusion situation. Replicating the past findings (Chernyak & Zayas, 2010; Critcher & Zayas, under review), excluded participants in both *friend-present* and *friend-absent* conditions estimated a significantly lower percentage of ball tosses from the fair person in the game compared to the actual percentage. These effects were observed irrespective of any individual differences but this finding should be interpreted carefully as our power to find these effects was only 30%.

### **Alternative explanation for the buffering effect**

In this study, we did not include a measure of the baseline affect. It is possible that just being with a friend could give the participants an initial boost in the mood and need levels. Therefore, even if the exclusion influenced their immediate responses, the effect could not be observed due to the difference in affect driven by this initial boost. For example, Kirschbaum and colleagues (1995) found that participants, who were accompanied by their partners in a study, where the effect of social support on cortisol levels was tested, reported significantly better mood not only after, but also before the experimental session. However, this explanation

seems to be unlikely because this boost should also be observed in included participants and we could not find such an effect in inclusion conditions.

### **Interpreting the existence of IEE in the presence of a close friend**

Critcher and Zayas (under review) have provided empirical evidence that being directly excluded in a situation is not necessary to misperceive the fair person as a foe. In their work, individuals who were merely observing a one-person exclusion paradigm engaged in involuntary excluder effect suggesting that it is more related to the social perception than the experience itself. Evolutionarily, the oversensitive ostracism detection system is ready to go off for any subtle cues of exclusion. This ability to read even the subtlest cues of exclusion could be considered as both a gift and a burden. On the one hand, it enables individuals to respond to social exclusion as soon as it happens, but on the other hand, it makes it really difficult to use a fair person in the situation as a buffer or an ally. In the present study, the presence of the friend was able to prevent the immediate negative effects of exclusion on mood and needs but the ostracism detection system was activated no matter how the participants felt. Therefore, participants misperceived the fair person as a part of the exclusion even in the presence of their friends.

### **Interpreting the lack of moderation by individual differences**

Although certain individual differences such as rejection sensitivity and attachment insecurity are well established to moderate the sensitivity to exclusion, it is also known that social exclusion is such a powerful negative experience that it could almost defeat any individual differences (Williams, 2007). Therefore, our finding indicating that none of the individual differences moderated the responses to social exclusion is in accordance with previously established empirical evidence.

Despite the findings of Teng and Chen (2012), we did not observe the moderation effect of self-esteem on the buffering effect of the presence of a friend. It could be possible that this difference arose due to the difference in the exclusion paradigm we employed in our study. The presence of a fair person in the game could possibly clear away all the individually different responses to exclusion. Because subtle and ambiguous exclusions, in which there is also an includer present, are more likely to encounter in daily life, this finding implies that the buffering effect of a friend could be more readily and more extensively observed in daily situations.

### **Implications and Future Directions**

This study has revealed that in subtle or ambiguous exclusion situations, the presence of a friend served as a buffer for all the individuals regardless of their personality differences. This finding suggests that in social settings such as schools where social exclusion is commonly experienced, the simple act of being with a friend could bring profound benefits including better mental health and improved functioning. Research on social support has shown that even the mental representation of a close other could provide the beneficial effects that an actual presence can bring. For example, McGowan (2002) found that mental representations of significant others reduced distress scores before a potentially stressful task for participants who had a positive view of self. Mental representations of attachment figures also reduced self-reported pain ratings (Eisenberger et al., 2011) and attenuated pain experience (Master et al., 2009). Recently, Selcuk and colleagues (2012) provided support that mental representations of significant others helped to recover faster after recalling an upsetting memory. In future studies, it would be worthwhile to investigate the potential buffering effect of mental representations of significant others.

Another interesting future direction would be to explore whether an experimentally created friend could buffer against the negative effects of social exclusion. If the buffering effect

of the friend arises from the mere presence effect, simply assigning a stranger to an individual and asking them to engage in a quick interaction might also provide a buffer in the face of exclusion. However, if it is the *friend* who provides the buffer by satisfying the need to belong, then this experimentally created buddy might fail to serve as a buffer.

Lastly, it would be worthwhile to replicate this study using a younger sample. There is a considerable body of research looking at the effect of a friend on social isolation and adjustment in adolescents but interestingly, the buffering role of friendships against social exclusion has not been studied using an adolescent sample yet. Adolescence is marked by increased importance of peer relationships, increased sensitivity to rejection and increased negative psychological outcomes associated with rejection (Masten et al., 2009). Therefore, the buffering role of friendships could be more prominent in such a sample.

## REFERENCES

- Anderson, J., & Zayas, V. (in preparation). Detecting subtle shifts in inclusionary status: Exclusion, inclusion, and overinclusion.
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*, 596-612.
- Aydin, N., Krueger, J.I., Fischer, J., Hahn, D., Kastenmüller, A., Frey, D., & Fischer, P. (2012). Man's best friend: How the presence of a dog reduces mental distress after social exclusion. *Journal of Experimental Social Psychology*, *48*, 446-449.
- Baldwin, M. & Fehr, B. (1995). On the instability of attachment style ratings. *Personal Relationships*, *2*, 247-261.
- Baskin, T. W., Wampold, B. E., Quintana, S. M., & Enright, R. D. (2010). Belongingness as a protective factor against loneliness and potential depression in a multicultural middle school. *The Counseling Psychologist*, *38*, 626-651.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529.
- Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of social exclusion on cognitive processes: Anticipated aloneness reduces intelligent thought. *Journal of Personality and Social Psychology*, *83*, 817-827.
- Benner, A. D. (2011). Latino adolescents' loneliness, academic performance, and the buffering nature of friendships. *Journal of Youth and Adolescence*, *40*, 556-567.
- Bernstein, M. J., & Claypool, H. M. (2012). Social exclusion and pain sensitivity why exclusion sometimes hurts and sometimes numbs. *Personality and Social Psychology Bulletin*, *38*, 185-196.

- Bowlby, J. (1988). *A secure base: Clinical applications of attachment theory*. London, England: Routledge.
- Cacioppo, J. T., & Hawkley, L. C. (2003). Social isolation and health, with an emphasis on underlying mechanisms. *Perspectives in Biology and Medicine*, *46*, S39-S52.
- Cacioppo, J. T., & Hawkley, L. C. (2005). People Thinking About People: The Vicious Cycle of Being a Social Outcast in One's Own Mind. In K. D. Williams, J. P. Forgas & W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying*. (pp. 91-108). New York, NY US: Psychology Press.
- Cacioppo, J. T., Hughes, M. E., Waite, L. J., Hawkley, L. C., & Thisted, R. A. (2006). Loneliness as a specific risk factor for depressive symptoms: Cross-sectional and longitudinal analyses. *Psychology and Aging*, *21*, 140-151.
- Chalmers, B., Wolman, W. L., Nikodem, V. C., Gulmezoglu, A. M., & Hofmeyer, G. J. (1995). Companionship in labour: Do the personality characteristics of labour supporters influence their effectiveness? *Curationis*, *18*, 77–80.
- Chernyak, N., & Zayas, V. (2010). Being excluded by one means being excluded by all: Perceiving exclusion from inclusive others during one-person social exclusion. *Journal of Experimental Social Psychology*, *46*, 582-585.
- Coan, J. A., Shaefer, H. S., & Davidson, R. J. (2006). Lending a hand: Social regulation of the neural response to threat. *Psychological Science*, *17*, 1032–1039.
- Cogan, R., & Spinnato, J. A. (1988). Social support during premature labor: Effects on labor and the newborn. *Journal of Psychosomatic Obstetrics and Gynecology*, *8*, 209–216.
- Cohen, T. A., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, *98*, 310–357.

- Collins, N. L., & Feeney, B. C. (2000). A safe haven: An attachment theory perspective on support seeking and caregiving in intimate relationships. *Journal of Personality and Social Psychology, 78*, 1053–1073.
- Critcher, C. R., & Zayas, V. (under review). The Involuntary Excluder Effect: Those included by an excluder are seen as exclusive themselves.
- Derryberry, D., & Reed, M. A. (2002). Anxiety-related attentional biases and their regulation by attentional control. *Journal of Abnormal Psychology, 111*, 225-236.
- DeWall, C. N., & Baumeister, R. F. (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*, 1-15.
- DeWall, C. N., Twenge, J. M., Gitter, S. A., & Baumeister, R. F. (2009). It's the thought that counts: The role of hostile cognition in shaping aggressive responses to social exclusion. *Journal of Personality and Social Psychology, 96*, 45-59.
- Diamond, L. M., & Hicks, A. M. (2004). Psychobiological perspectives on attachment: Implications for health over the lifespan. In J. A. Simpson & W. S. Rholes (Eds.), *Adult attachment: New directions and emerging issues* (pp. 240–263). New York, NY: Guilford Press.
- Ditzen, B., Schmidt, S., Strauss, B., Nater, U. M., Ehlert, U., & Heinrichs, M. (2008). Adult attachment and social support interact to reduce psychological but not cortisol responses to stress. *Journal of Psychosomatic Research, 64*, 479–486.
- Downey, G., & Feldman, S. I. (1996). Implications of Rejection Sensitivity for Intimate Relationships. *Journal of Personality and Social Psychology, 70*, 1327-1343.
- Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI

- study of social exclusion. *Science*, 302, 290–292.
- Eisenberger, N. I., & Lieberman, M. D. (2005). Why it hurts to be left out: The neurocognitive overlap between physical and social pain. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying* (pp. 109-130). New York, NY: Psychology Press.
- Eisenberger, N. I., Master, S. L., Inagaki, T. K., Taylor, S. E., Shirinyan, D., Lieberman, M. D., & Naliboff, B. D. (2011). Attachment figures activate a safety signal-related neural region and reduce pain experience. *Proceedings of the National Academy of Sciences, USA*, 108, 11721–11726.
- Fraley, R. C., Waller, N. G., & Brennan, K. A. (2000). An item response theory analysis of self-report measures of adult attachment. *Journal of Personality and Social Psychology*, 78, 350-365.
- Gardner, W., Pickett, C. L., & Brewer, M. B. (2000). Social exclusion and selective memory: How the need to belong influences memory for social events. *Personality and Social Psychology Bulletin*, 26, 486–496.
- Gerber, J. P., & Wheeler, L. (2009). On being rejected: A meta-analysis of experimental rejection research. *Perspectives on Psychological Science*, 4, 468-488.
- Gonsalkorale, K., & Williams, K. D. (2007). The KKK won't let me play: Ostracism even by a despised outgroup hurts. *European Journal of Social Psychology*, 37, 1176–1186.
- Grewen, K. M., Anderson, B. J., Girdler, S. S., & Light, K. C. (2003). Warm partner contact is related to lower cardiovascular reactivity. *Behavioral Medicine*, 29, 123–130.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology*, 2, 271–299.

- Gross, J. J. (2001). Emotion regulation in adulthood: Timing is everything. *Current Directions in Psychological Science*, 10, 214–219.
- Harlow, H. F. (1958). The nature of love. *American Psychologist*, 13, 673–685.
- Hawley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine*, 40(2), 218–227.
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 52, 511–524.
- Ho, E.J., Surenkok, G., & Zayas, V. (2014). Explicit but not implicit mood is affected by progressive social exclusion. *Journal of Interpersonal Relations, Intergroup Relations and Identity*, 7, 22–37.
- Hodnett, E. D., Gates, S., Hofmeyr, G. J., & Sakala, C. (2007). Continuous support for women during childbirth. *Cochrane Database Syst Rev*, 3.
- Inquisit 3.0.5.0 [Computer software] (2010). Seattle, WA: Millisecond Software LLC.
- Kamarck, T. W., Manuck, S. B., & Jennings, J. R. (1990). Social support reduces cardiovascular reactivity to psychological challenge: A laboratory model. *Psychosomatic Medicine*, 52, 42–58.
- Kerr, N. L., & Levine, J. M. (2008). The detection of social exclusion: Evolution and beyond. *Group Dynamics: Theory, Research, and Practice*, 12, 39–52.
- Kirschbaum, C., Klauer, T., Filipp, S.-H. & Hellhammer, D. H. (1995). Sex specific effects of social support on cortisol and subjective responses to acute psychological stress. *Psychosomatic Medicine*, 57, 23–31.
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer

- theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology*, (pp. 1-62). San Diego, CA US: Academic Press.
- Leary, M. R., & Springer, C. A. (2001). Hurt feelings: The neglected emotion. In R. Kowalski (Ed.), *Aversive behaviors and interpersonal transgression* (pp. 151–175). Washington, DC: American Psychological Association.
- Leary, M. R., Springer, C. A., Negel, L., Ansell, E., & Evans, K. (1998). The causes, phenomenology, and consequences of hurt feelings. *Journal of Personality and Social Psychology*, *74*, 1225–1237.
- Lidderdale, J. M., & Walsh, J. J. (1998). The effects of social support on cardiovascular reactivity and perinatal outcome. *Psychology and Health*, *13*, 1061–1070.
- MacDonald, G., & Leary, M. R. (2005). Why does social exclusion hurt? The relationship between social and physical pain. *Psychological Bulletin*, *131*, 202-223.
- Masten, C. L., Eisenberger, N. I., Borofsky, L. A., Pfeifer, J. H., McNealy, K., Mazziotta, J. C., & Dapretto, M. (2009). Neural correlates of social exclusion during adolescence: Understanding the distress of peer rejection. *Social Cognitive and Affective Neuroscience*, *4*, 143-157.
- Master, S. L., Eisenberger, N. I., Taylor, S. E., Naliboff, B. D., Shirinyan, D., & Lieberman, M. D. (2009). A picture's worth: Partner photographs reduce experimentally induced pain. *Psychological Science*, *20*, 1316–1318.
- McGowan, S. (2002). Mental representations in stressful situations: The calming and distressing effects of significant others. *Journal of Experimental Social Psychology*, *38*, 152–161.
- Mikulincer, M., & Shaver, P. R. (2007). Boosting attachment security to promote mental health, prosocial values, and inter-group tolerance. *Psychological Inquiry*, *18*, 139-156.

- Nezlek, J. B., Kowalski, R. M., Leary, M. R., Blevins, T., & Holgate, S. (1997). Personality moderators of reactions to interpersonal rejection: Depression and trait self-esteem. *Personality and Social Psychology Bulletin, 23*, 1235–1244.
- Niven, C. (1985). How helpful is the presence of the husband at childbirth? *Journal of Reproductive and Infant Psychology, 3*, 45–53.
- Park, K., Wilson, M. G., & Lee, M. S. (2004). Effects of social support at work on depression and organizational productivity. *American Journal of Health Behavior, 28*, 444–455.
- Phillips, J. M., & Gatchel, R. J. (2000). Extraversion–introversion and chronic pain: Locus of control in the patient with chronic pain. In R. Gatchel & J. Weisberg (Eds.), *Personality characteristics of patients with pain* (pp. 181–202). Washington, DC: American Psychological Association.
- Pickett, C. L., Gardner, W. L., & Knowles, M. (2004). Getting a cue: The need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin, 30*, 1095–1107.
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*, 203–212.
- Rosenberg, M. (1989). *Society and the adolescent self-image*. Middletown, Conn: Wesleyan University Press.
- Selcuk, E., Zayas, V., Günaydin, G., Hazan, C., & Kross, E. (2012). Mental representations of attachment figures facilitate recovery following upsetting autobiographical memory recall. *Journal of Personality and Social Psychology, 103*, 362–378.
- Smith, A., & Williams, K. D. (2004). R U there? Effects of ostracism by cell phone messages.

- Group Dynamics: Theory, Research, and Practice*, 8, 291–301.
- Spoor, J., & Williams, K. D. (2007). The evolution of an ostracism detection system. In J. P. Forgas, M. Haselton, & W. von Hippel (Eds.), *The evolution of the social mind: Evolutionary psychology and social cognition* (pp. 279–292). NY: Psychology Press.
- Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development*, 48, 1184-1199.
- Tai, K., Zheng, X., & Narayanan, J. (2011). Touching a teddy bear mitigates negative effects of social exclusion to increase prosocial behavior. *Social Psychological and Personality Science*, 2, 618-626.
- Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behaviors. *Journal of Personality and Social Psychology*, 81, 1058–1069.
- Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2002). Social exclusion causes self-defeating behavior. *Journal of Personality and Social Psychology*, 83, 606-615.
- van Beest, I., & Williams, K. D. (2006). When inclusion costs and ostracism pays, ostracism still hurts. *Journal of Personality and Social Psychology*, 91, 918–928.
- Williams, K. D. (1997). Social ostracism. In R. M. Kowalski (Ed.), *Aversive interpersonal behaviors* (pp. 133–170). New York: Plenum.
- Williams, K. D. (2007). Ostracism. *Annual Review of Psychology*, 58, 425–452.
- Williams, K. D. (2009). Ostracism: A temporal need-threat model. In M. Zanna (Ed.), *Advances in experimental social psychology* (pp. 279–314). NY: Academic Press.
- Williams, K. D., Bernieri, F. J., Faulkner, S. J., Gada-Jain, N., & Grahe, J. E. (2000). The Scarlet Letter Study: Five days of social ostracism. *Journal of Personal and Interpersonal Loss*,

5, 19-63.

- Williams, K. D., Cheung, C., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology, 79*, 748-762.
- Williams, K. D., & Zadro, L. (2005). Ostracism: The indiscriminate early detection system. In K. D. Williams, J. P. Forgas, & W. von Hippel (Eds.) *The social outcast: Ostracism, social exclusion, rejection, and bullying*. (pp. 19–34). New York: Psychology Press.
- Zadro, L., Boland, C., & Richardson, R. (2006). How long does it last? The persistence of the effects of ostracism in the socially anxious. *Journal of Experimental Social Psychology, 42*, 692-697.
- Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower mood and self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40*, 560–567.
- Zhong, C. B., & Leonardelli, G. J. (2008). Cold and lonely: Does social exclusion literally feel cold? *Psychological Science, 19*, 838-842.
- Zayas, V., Mischel, W., Shoda, Y., & Aber, J. L. (2011). Roots of adult attachment: Maternal caregiving at 18 months predicts adult attachment to peers and partners. *Social Psychological and Personality Science, 2*, 289-297.
- Zayas, V., & Shoda, Y. (2005). Do automatic reactions elicited by thoughts of romantic partner, mother, and self relate to adult romantic attachment? *Personality and Social Psychology Bulletin, 31*, 1011–1025.

## APPENDIX

### **The findings of the analyses that excluded participants who reported suspicion**

*Manipulation check: Did participants perceive being excluded or included?*

Participants correctly perceived when they were being excluded or included in the game, as shown by their averaged estimations of the percentage of ball tosses that they received from the other players (One-person exclusion:  $M = 27.45\%$ ,  $SD = 10.48$ ; Inclusion:  $M = 46.22\%$ ,  $SD = 6.09$ ). A GLM in which the presence of the friend and the inclusionary condition were entered as between-subjects factors for the averaged estimation of the percentage of ball tosses revealed that only the inclusionary condition had a main effect on this averaged estimation,  $F(1, 120) = 152.64$ ,  $p < 0.001$ ,  $\eta_p^2 = .56$ . The presence of the friend, however, did not have a main effect on the averaged estimation of the percentage of ball tosses,  $F(1, 120) = 1.29$ ,  $ns$ ,  $\eta_p^2 = .01$ . The interaction between the two independent factors was also non-significant,  $F(1, 120) = .43$ ,  $ns$ ,  $\eta_p^2 = 0$ .

*Did the presence of the friend help against the negative effects of one-person exclusion?*

A GLM in which the presence of the friend and the inclusionary condition were entered as between-subjects factors revealed that the presence of the friend had a significant main effect on composite mood and needs,  $F(1, 123) = 11.78$ ,  $p = .001$ ,  $\eta_p^2 = .09$ . When participants were in the presence of their friends, they reported better composite mood and needs irrespective of their inclusionary status in the game (Friend-present:  $M = 4.93$ ,  $SD = 0.81$ ; Friend-absent:  $M = 4.48$ ,  $SD = 1.03$ ). The social inclusionary status (inclusion vs. exclusion) also had a significant main effect on composite mood and needs,  $F(1, 123) = 9.57$ ,  $p = .002$ ,  $\eta_p^2 = .07$ . Excluded participants reported worsened composite mood and needs than included participants irrespective of the presence of their friend (One-person exclusion:  $M = 4.46$ ,  $SD = 1.12$ ; Inclusion:  $M = 4.95$ ,  $SD =$

0.70). The interaction between the two independent factors was also significant,  $F(1, 123) = 13.61, p < .001, \eta_p^2 = 1$ . This effect was primarily driven by a significant difference in the affect reported by the excluded participants in the *friend-absent* condition and the excluded participants in the *friend-present* condition (Friend-present:  $M = 4.95, SD = 0.93$ ; Friend-absent:  $M = 3.91, SD = 1.08, t(53) = 3.82, p < .001, d = 1.02$ ). In other words, in line with our hypothesis, the presence of a friend was able to help individuals feel better against the negative affective consequences of social exclusion.

*IIE: Was the includer perceived as a part of the exclusion?*

Participants, who did not indicate any suspicions about the experiment, also perceived the fair person as an excluder. We subtracted the estimated percentage of ball tosses participants reported (36.05%) in the one-person exclusion condition from the actual percentage of ball tosses participants received from the fair person (50%). A one-sample t-test assessing whether this score was significantly different from zero showed that it was,  $t(51) = 7.68, p < .001, d = 1.06$ . To compute this score in the inclusion condition, we calculated the average of the estimated percentage of ball tosses received from both players because both players were fair players in this condition. When we subtracted this score (44.87%) from the actual percentage (50%) and assessed whether this score was significantly different from zero, we found that this score was also significantly different,  $t(71) = 5.49, p < 0.001, d = .65$ . Although the effect size for this difference is much smaller, this finding is still interesting. However, for the purposes of this study, the more important question was whether this difference differed significantly across conditions. A GLM in which the presence of the friend and the inclusionary condition were entered as between-subjects factors for the averaged difference between the estimated and the actual percentage of ball tosses received from the fair person revealed that only the inclusionary

condition had a main effect on this difference,  $F(1,120) = 21.83, p < 0.001, \eta_p^2 = .15$ . The presence of the friend, however, did not have a main effect on the averaged difference between the estimated and the actual percentage of ball tosses received from the fair person,  $F(1, 120) = .147, ns, \eta_p^2 = 0$ . The interaction between the two independent factors was also non-significant,  $F(1, 120) = .23, ns, \eta_p^2 = 0$ .

*Did individual differences moderate the effects?*

Our analyses including only the participants who did not indicate any suspicion again showed that all the individual differences except agreeableness and openness were significantly correlated with composite mood and needs regardless of the condition the participant was in.

However, based on the GLMs in which the presence of the friend and inclusionary status were entered as between-subjects factors and separate individual differences measures as covariates, individual differences failed to provide a reliable moderation for the effects of exclusion. Moreover, the lack of significant 3-way interactions indicated that individual differences did not reliably moderate the buffering effect of the presence of the friend. However, one must be careful in interpreting this null finding because interaction effects are notoriously weaker than main effects and our sample size of 127 provides only about 20% power to detect a medium effect size.