

THE DESIRE FOR SOCIAL RECONNECTION AFTER SOCIAL REJECTION AS SHOWN
ON THE APPROACH-AVOIDANCE TASK

by

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Abstract

Theories concerning social rejection propose that rejected individuals are motivated by the need to belong following exclusion. The current study examined the motive to reconnect after rejection by using the Approach-Avoidance Task (AAT). The AAT measures the desire to reconnect automatically as shown by assessing approach and avoidance motor responses. Based on previous research, it was anticipated that excluded participants would approach happy faces faster than neutral faces compared to included participants. This study was conducted with 34 undergraduate participants. Each participated in a game of Cyberball and was exposed to either social inclusion or exclusion. Following Cyberball, participants then performed the AAT to measure the automatic inclination to reconnect. The results were found to be non-significant, and the hypothesis stated above was not confirmed. However, the results trended towards significance, which is consistent with previous research. The findings of this study suggest that the motivation to reconnect following rejection may be instinctive. Overall, for a between-subjects design the small sample size lead to inconclusive results. Further research is necessary to test the hypothesis with a larger sample.

Keywords: ostracism, social rejection, social exclusion, social reconnection, cyberball, the approach-avoidance task

Desire for Social Reconnection after Social Rejection as shown on the Approach-Avoidance Task

People have a fundamental need to belong. When a human being is rejected by others, they tend to seek out new connections to rebuild their weakened self-esteem and emotional stability. The social reconnection hypothesis (Maner et al., 2007) proposes that following rejection by others, human beings are motivated to reconnect by their subconscious, hardwired desire to belong. Evolutionarily speaking, humans are socialized for survival. Not only is the development of the mind severely hindered when disconnected from others, but if someone is isolated from their community, they won't have the necessary means of protection, shelter, food, or sexual production. People need each other to survive. According to the social reconnection hypothesis, when a person is socially rejected, it leads them to reconnect with new groups of people.

Cyberball is the most widely used paradigm to study the effects of social rejection. It is a computer-simulated game of catch in which cartoon characters are programmed either to play catch with the participants or to not pass the ball to them. This simulates the participant being either socially accepted or socially ostracized. Cyberball studies have found the effect of ostracism to be robust; it appears across cultures, language, study environments, and age groups. It induces feelings of rejection, poor self-esteem, and loss of confidence (Hartgerink et al., 2015). This study will build on prior Cyberball studies by testing if after social exclusion, the need to reconnect is displayed in a split-second basis. We will measure instantaneous reconnection responses using the Approach-Avoidance task (AAT; Heuer et al., 2007). It is expected that social rejection during Cyberball will cause participants to reconnect with others. The desire for social connections could be shown by approach responses on the AAT.

The AAT will be used in our study to measure the effects of social rejection on approach behavior. The AAT measures the basic response tendencies of approach and avoid. Approach behavior on the AAT tests an automatic behavioral response of reconnection by presenting facial expressions to subjects on a computer screen. The subjects react to the faces by either approaching or avoiding them, this indicates how rapidly the desire to reconnect is deployed. We expect that participants who were socially rejected will approach the happy faces versus neutral faces faster than socially accepted participants.

Before presenting the study, I will first present a review of the relevant literature to put the hypotheses into perspective.

The Social Reconnection Hypothesis – A Series of Tests by Maner et al (2007)

Maner, DeWall, Baumeister, and Schaller (2007) conducted a series of studies investigating the Social Reconnection Hypothesis. This hypothesis branched from theories related to motivation, deprivation, and goal attainment. Per the hypothesis, when an individual is rejected by others, they commonly seek reconnection with outside groups to rebuild confidence and belonging. Per their predictions, social exclusion is linked to motivation in building new bonds with others who the rejected person perceives as welcoming.

The purpose of their first study (Maner et al., 2007) measured if individuals who recall memories of exclusion are motivated to build new connections. Fifty-six undergraduate subjects experienced an exclusion manipulation. Participants were randomly assigned to three groups in which they were asked to recall and write about previous encounters of either (1) social exclusion and rejection, (2) social acceptance, or (3) neutral experiences. Subjects placed in the exclusion condition composed an essay recalling a memory of social rejection. Subjects in the social acceptance condition wrote about a memory of social acceptance. Those placed in the

control condition wrote about their activities the day prior. Once participants completed the visualization and essay, they then completed a questionnaire regarding a fake student service called “Florida State University Connect.”. In the questionnaire, they stated how likely they would be to engage in this student service to build new connections with fellow students. FSU Connect claimed to organize student events involving concerts and game nights and was told that student fees at FSU would be increased by \$75 to fund the program’s availability on campus. Participants responded to ten statements that measured their desire to meet new people from the service. The results of the experiment supported the Social Reconnection Hypothesis, illustrating that recalling a memory of social exclusion increased students' desire to meet and connect with new friends, even if that meant utilizing a paid service as a tool for outreach.

In their second study, Maner et al. (2007) Investigated whether social exclusion motivates an individual to build new connections. Researchers induced social rejection in the form of social feedback by having thirty-four undergraduate students complete a personality test, and then randomly assigning the subjects to receive fake feedback. Participants were told that the purpose of the study was to understand different aspects of personality in relation to introversion and extraversion, and initially completed a brief demographic questionnaire and the Eysenck Personality Questionnaire. After the completion of the tasks, participants were given accurate feedback on their extraversion levels, then they were then randomly assigned to one of three types of social feedback. These conditions consisted of (1) Future-alone: Participants in this group were told that based on the personality questionnaire they completed, they would likely be completely alone in the future. (2) future-belonging: Individuals assigned to this condition were told that they were likely to have rewarding and stable relationships throughout life, and (3) misfortune-control unrelated to exclusion: This group was told that they are likely to be accident

prone later in life. The researcher then told participants that they would need to participate in another task with an additional experimenter down the hall because the initial study was short. To see if anticipating future rejection and isolation would motivate people to forge new bonds, the participants were then told that some students would have to complete the task alone, and others would do the task in groups. The experimenter told participants that the researchers would consider each subject's preference of working either alone or in groups. Participants' desire for social contact was measured with a sheet of paper on which participants were given a scale to indicate their desire to work either alone or in groups ranging from 0-11. The results of this study supported the social reconnection hypothesis. The present fear of social exclusion in the form of feedback predicting an isolated future drove individuals to increase their preference for partnership with others. Those who are disconnected possess a strong motivation to forge new bonds. The increased motivation to affiliate was distinct to people who received the social exclusion feedback. Subjects within the misfortune control group did not show any increase in the need to engage.

In their third study, Maner et al., (2007) measured the cognitive changes that are linked to the desire to connect. The researchers predicted that actual rejection in the present would make subjects more inclined to perceive new people as welcoming and friendly, and more inclined to connect with them. There were eighteen undergraduate participants, separated into same-sex groups of three or four and were told the purpose of the study was to investigate group dynamics. Participants were told that for the first activity members, of a large group would interact with each other to get to know one another. The subjects were provided with name tags and a set of discussion questions. After engagement and learning each other's names, individuals were told to work informally through their discussion questions. While the subjects performed this task the

experimenter left the room and returned 15 minutes later, to then lead participants to individual rooms. The participants were then informed that the experimenter would like to form groups of two and they were told to name two people that they met and would like to work with. Individuals completed a brief demographic questionnaire while the experimenter was forming the groups. The participants were then informed of how the groups were formed. Social exclusion was induced by the experimenter informing the participants about the groups. Some individuals were told that no one in the group had picked them to work with. Others were informed that everyone wanted to work with them. This form of experimental manipulation provided an immediate and direct form of social exclusion. After the exclusion manipulation, subjects were asked to provide a rating on several new people as to their level of sociability, attractiveness, and level of hostility. Results found that participants who were excluded viewed new social partners as nicer and friendlier. Additionally, exclusion did not lead participants to view others as hostile or negatively. The results of the study supported the social reconnection hypothesis because after social exclusion, viewing others as friendly and welcoming is consistent with restoring social bonds.

In their fourth study, Maner et al., (2007) measured the effects of fear of negative evaluation on the desire to form new social connections in participants who had been excluded. Thirty-four undergraduate students were randomly assigned to groups on why their partners left. The study started with participants sending a videotape to someone who they presumed was another participant. The participant was told beforehand that they would be meeting with the other “participant” after a short video message exchange. After sending their first videotape, participants filled out a twelve-item fear of negative evaluation scale. Then after receiving and reviewing the response video, participants then had to send a response video talking about their

personal and career goals. The experimenter would return after 5 minutes and randomly assign the participant to one of two rejection groups as to why they couldn't meet up with their partner. (A) Personal departure; participants were told their partner did not want to meet them and (B) Non-personal departure; participants were told their partner had to leave due to forgetting to do something. The study concluded with the participants being told that they had the chance to reschedule the meeting or meet with someone new and the participant filling out a mood scale. Results of this study showed that rejection can provide both positive and negative social perceptions; those who are high in fear have a maladaptive rejection schema, and low in fear individuals have an adaptive schema. This study was consistent with the social reconnection hypothesis. The impact of social exclusion varies on the person's perspective and is subjective to the individual's differences in fear of negative evaluation. Those rated high in fear of negative evaluation did not view social partners in an optimistic light. They didn't want to meet up with anyone new, regardless of the reason for departure. The social reconnection hypothesis does not apply to those in high in fear of negative evaluation, and may imply that these individuals may have social anxiety disorder. Those who rated low in fear of negative evaluation were comfortable with meeting up with someone new and viewed partners as friendly and nice.

In their last study, Maner et al., (2007) expanded on an experiment like their fourth study. This study was conducted to provide further confirmation that socially positive responses to rejection are motivated by a desire to reconnect with others. The participant's expectation of future interaction with their partner was the study's crucial independent variable. The fifty-three undergraduate participants were either assigned to one of two conditions in which a partner would not meet with them for one of two reasons- a non-personal departure (control) or because they did not want to meet with them (personal rejection). Participants were told that they would

be interacting with a same-sex partner by sending video messages back and forth, and that their partner would send the initial message. For participants who were assigned to the non-personal departure condition, the experimenter told them that their partner forgot to do something and had to leave early. Participants that were assigned to the personal rejection condition were told that after their partner watched their video response, they did not want to meet them. Individuals then completed a brief self-report mood scale and the Positive and Negative Affect Schedule (PANAS). Both scales were utilized in this study to provide a stronger basis of the potential role of affect. The experimenter returned and told participants that the next part of the experiment would involve one participant assigned the role of a manager, and they were made to believe that a peer would be taking on the role of a worker. Managers were given coins and provided with a piece of art that was supposedly completed by the worker. Managers were asked to rate the work on a creativity scale of 0-20 and deposit a coin in a cup for every point the partner earned. The rest of the coins that weren't used in rating the worker the manager would keep for themselves. Some participants were told that they would meet the worker after they evaluated their work, and others were told that they would not be meeting the worker.

The results indicated that when social reconnection was anticipated after giving an evaluation, participants were more likely to award more money for the worker's art instead of keeping it for themselves. Participants who were previously rejected were more generous with their money when they anticipated meeting their social partner as opposed to when they were not meeting their partner. The reason for previous rejection (non-personal departure or personal rejection) made no difference. A possible limitation of this study would be the concept of the manager and worker role. Individuals usually don't experience a bond or friendship with their bosses. Another limitation of this study was that the participants may have awarded more money

simply because they were aware that they would be meeting the person, and thus wanted to avoid interpersonal conflict. Overall, research by Maner et al., (2007) provided insight on how people can respond when faced with social rejection. One of the ways humans respond to rejection is to rebuild and seek reconnection, the findings of this research confirmed that affect.

Meta-analyses of Social Rejection Studies

To provide further research on the impact of social rejection, a series of meta-analyses will be presented. A meta-analysis is a statistical analysis that combines the results of multiple scientific studies, and assesses those results of previous research to derive conclusions about that body of research.

Hartgerink et al., (2015) conducted a meta-analysis of 120 Cyberball studies, the most widely used social rejection paradigm. Cyberball is a computer game in which cartoon characters simulate social exclusion and acceptance by playing catch. The participant is either socially rejected or accepted by the other characters in the program either playing catch with them, or not throwing the ball to them. The Cyberball studies were examined to determine the effect size of ostracism and if it was possible to reverse, eliminate or minimize the effects. The meta-analysis showed that the average ostracism effect on mood is large and generalizes across the number of players, duration, number of tosses, types of needs scale, sampling aspects and various types of dependent measures. Ostracism does not only impact the participants themselves, but can impact others in the environment of the ostracized individual. The results of the analyses also showed the average effect size of ostracism is not bound to culture or country. Thus, there is no systematic difference in the ostracism response. Even when social exclusion occurs during a computerized cartoon game, it can have a negative effect on mood, and the effect is robust. The effects last for a good deal of time, and the level of exclusion can be moderated or influenced.

There are numerous ways that an individual can react to rejection; prior reviewed research has provided insight on the desire to reconnect, but can an individual become emotionally numb when exposed to rejection?

To further expand on the impact and human response of rejection, Gerber and Wheeler (2009) also conducted a meta-analysis of experimental research on social rejection based on 88 studies. They examined two issues concerning rejection (a) the effects of rejection on internal states (mood and self-esteem), and (b) the behavioral effects of rejection on pro-versus antisocial responses to rejection. Another behavioral effect researchers measured was whether people cope with social rejection by becoming emotionally numb. This also known as affective blunting, and is characterized by people coping with unpleasant emotion by not experiencing emotion. The meta-analysis provided insight into how rejection can induce individuals to suppress emotion. Results showed that rejection impacts people negatively, lowering mood and self-esteem, making the individual alert that something is wrong. As a result, they become more self-conscious and act in ways to regain confidence by reconnecting with others or restoring control. Overall, rejection does not make them less aroused and people do not become emotionally numb. In general, aggression after rejection is facilitated by the need for control, to enact revenge on those who rejected them. A weakness of this study is it did not distinguish when people are going to be aggressive or prosocial following social rejection. The article does not answer this question.

Effects of Ostracism on Adolescents

Ostracism is the act of exclusion from an individual or group. The influence of ostracism is a universal; the act of exclusion is not confined by environment, culture, or age.

Ruggieri et al., (2013) examined the effects of peer-related ostracism in early adolescence. The participants were 91 non-English speaking school students, aged 10-14 years-

old. The participants were randomly assigned to either the exclusion condition or the inclusion condition. Before and after playing Cyberball, students self-reported mood on a Likert scale. They were informed that they would be playing an internet ball-tossing game with two other same-sex peers that were also participating in the experiment when they were the only ones playing the game. The students were told to imagine they were playing a game of toss with two other peers. Results supported the researcher's hypothesis that the students who were excluded reported feeling more rejected than children who were included. There was no effect of Cyberball Inclusion. These results show that the Cyberball effect holds up with non-English speaking and younger individuals. This is relevant to our current study because some of the participants will be younger and non-English speaking.

Nonconscious Social Reconnection Studies

The current study is measuring if the motive to socially reconnect can occur subconsciously. Prior studies have tested this hypothesis. Lankin et al., (2008) conducted two experiments on subconscious mimicry as an instinctual behavioral response to being rejected. In the researchers' first experiment, they tested the hypothesis that when people are excluded they will automatically mimic others in an attempt to reconnect. Forty students completed two tasks. They first played Cyberball with three other players, those in the inclusion condition received the ball as frequently as the other players. Those in the exclusion condition received the ball a few times at the beginning of the game. Participants weren't provided with information about the other players and were told that they would never meet them. The participant's second task was describing photographs to a partner who hadn't seen the photos before. The experimenter told the participant that their partner had not arrived and they left to retrieve the partner. While the participant was alone, the experimenter videotaped his or her habitual foot movement, as a

baseline measure. The experimenter then returned with a female confederate who was blind to the condition and steadily moved her foot throughout her interaction with the subject. Following completion of the task, the participant completed another questionnaire consisting of only one question of interest asking if the participant had noticed anything about the partner's mannerisms. Results of the study showed that those who were excluded during Cyberball mimicked their partner's foot-tapping and tapped their foot much more than at baseline, compared to those who were accepted. They subconsciously mimicked their partner as shown by the foot-tapping, presumably in order to reconnect. A strength of this experiment is it is naturalistic; it showcases how people naturally socially respond to rejection. The authors wrote, "This would be consistent with excluded individuals having an increased desire to affiliate, and would suggest that automatic mimicry occurs whenever the need to affiliate exists and the opportunity arises. However, another possibility is that mimicry is more selective: Perhaps excluded people use this automatic behavior only under particular circumstances." (p. 818).

Thus, in their second experiment, Lankin et al., (2008) examined if nonconscious mimicry shown by those who are rejected is selective. The 164 student participants followed an identical procedure as the first experiment. During the Cyberball game, the participants knew the gender of the other players. The study followed an in-group or out-group design: the in-group was considered female (same gender as the participant) and the out-group was considered male. This created 4 groups of participants: accepted by males or by females during Cyberball; and rejected by males or females during Cyberball. After the participants played the game, they then took a questionnaire rating their belongingness to the group, their self-esteem, how in control they felt of their lives, and how meaningful life was to them. Afterward, they were then introduced to a new interaction partner, either male or female, who steadily tapped her foot throughout her

interaction with the subject. Results showed that mimicry of foot tapping was most pronounced in female participants when they were excluded by female rather than male players, and interacted with a female confederate. Mimicry directly addressed threatened belongingness needs after females rejected the participants when compared to those who were rejected by males.

The basis of human connection is touch. Thus, touch may relieve the distressing experience of exclusion. Von Mohr et al., (2017) investigated how slow, affective touch may help individuals who are excluded bond with others. Eighty-four female college students were randomly allocated into one of two groups; a slow touch group or, a fast touch group. Participants were told they would be playing an online ball-tossing game against two other subjects, they were not informed that these other players were computer-generated. Before starting the Cyberball task, participants completed a demographic questionnaire. They first played the Cyberball-inclusion game; all players received an equal number of ball-tosses. Following completion of the inclusion condition, subjects reported feelings of belongingness. After a 10-minute break of Sudoku, participants played Cyberball. When the task was over, participants were blindfolded. The experimenter touched the subject's left forearm for 70 seconds with a soft brush. The brush would pass over the participant's skin at one of two speeds; a slow speed (ct-optimal speed) or fast speed (non-ct-optimal speed). Following the procedure, participants completed a self-report scale on how they were feeling. Results showed that participants perceived slow touch as more pleasant than fast touch, regardless of the participant's assigned group. The effect of touch is evolutionarily based; we are pre-wired to be soothed by touch. The findings also supported their predictions that slow touch (ct-optimal speed) provided comfort and diminished the effects of ostracism. The results also showed that participants who received slow touch post-ostracism reported less need-threat than those who were exposed to fast

touch. The findings of this study provide significance showing that the human desire to reconnect is shown automatically.

Assessing Social Approach and Avoidance Behavior

The Approach-Avoidance Task (AAT) will be used in this study to evaluate the effects of social exclusion on automatic social connection reactions. Heuer, Rinck, and Becker (2007) utilized the AAT: originally developed by Solarz (1960) to directly explore avoidance and approach reactions to stimuli of potential social threat. Forty-three highly socially anxious individuals (HSAs) and 43 non-anxious controls (NACs) engaged in the AAT by testing the hypothesis that socially anxious people will avoid angry faces more than non-anxious controls. Participants are instructed to either push (avoidance) or pull (approach) a joystick in response to emotional faces expressing anger, happiness, and neutral affect. When a face is pulled, it expands to fill the screen, giving the visual impression that the face is approaching. By contrast, when a face is pushed, it gets smaller on the screen. This gives the visual effect of it getting further away, indicating the participant is avoiding the interaction. Thus, the participants either pulled (approached) or pushed (avoided) the angry, neutral, and smiling faces. This study compared the reaction times of basic response tendencies of highly socially anxious individuals in contrast to those who are not socially anxious. Results showed that highly socially anxious individuals avoided not only the angry faces more than the non-socially anxious participants but also the smiling faces. HSAs rated the smiling faces positively but reacted to them with avoidance nonetheless. As expected, NSAs avoided angry faces more than happy faces. There were no group differences found for reaction times to neutral faces. Based on the contrasting results of HSAs and NACs, the AAT is found to be a valid measure of automatic approach and avoidance tendencies. These results imply that highly socially anxious individuals may withdraw not only

in response to the fear of social rejection, but even in response to social acceptance. We expect that social rejection will make individuals approach happy faces, and this study shows that socially anxious people do the opposite. Consequently, we need to exclude socially anxious participants from our sample; including them may confound the results.

The current study will build on prior research by using the AAT. Prior AAT research has shown that individuals will approach happy faces, and avoid angry faces. Based on the social reconnection theory, if social rejection causes people to want to reconnect with others, then that desire should be shown in automatic tendencies to approach others who represent potential new connections. Thus, it is hypothesized that participants who are rejected during Cyberball will approach happy faces versus neutral faces on the AAT faster than those who were accepted during Cyberball.

Methods

Participants

Thirty-four Participants were recruited from undergraduate psychology classes. There were 13 male, 19 female, and 2 non-binary subjects ($M = 25.4$, $SD = 10.5$, range 17-55). Participants were identified as non-socially anxious by using the Fear of Negative Evaluation Scale (Leary, 1983). Participants scored no higher than the 30th percentile on this scale. Prior studies have found that participants scoring high in FNE can confound the results and thus need to be identified. Subjects provided electronic informed consent and were compensated with class credit in exchange for participating.

Experimental Design

Participants were randomly assigned to the Cyberball inclusion and exclusion groups. Cyberball inclusion involved the subject being socially accepted by having the ball being passed to them. Cyberball exclusion meant that the participant was socially ostracized by having the ball

not being passed to them. To see if the social exclusion affected their need to reconnect, the participants did two different versions of the AAT after Cyberball. In one version, they moved a stick figure towards (approach) happy faces, and moved the figure away from (avoid) neutral faces. In the other version, they moved the figure away from happy faces, and towards neutral faces. The order of the two versions was counterbalanced across participants. The faces were presented in the same random order to all participants. Subjects were exposed to 36 happy faces, and 36 neutral faces on each AAT, or 72 trials, and thus a total of 144 trials throughout the experiment. Overall, this experiment followed a 2 x 2 x 2, Cyberball group (excluded or included) x Facial expression (Happy and neutral, within subjects) x Action (approach and avoid, within subjects). The main hypothesis was that excluded participants, compared to included participants, would approach happy faces faster than neutral faces. We tested this hypothesis by measuring how quickly participants moved the stick figure towards the faces on the AAT.

Measures, Materials, and Equipment

The Fear of Negative Evaluation Scale (FNES) (Leary, 1983) was used to exclude highly socially anxious participants in our study. The FNES is a 12-item scale consisting of statements regarding one's self esteem and degree of anxiety about others having a negative perception about them. The participant rates each item on a 5-point Likert scale. For example, the subject is presented with the statement "I am frequently afraid of other people noticing my shortcomings." They then respond on a 1-5 Likert scale, 1 meaning "Not at all characteristic of me", and the highest option on the scale 5 meaning "Extremely characteristic of me".

The Approach-Avoidance-Task (Heuer et al., 2007) was used to assess the automatic behavioral response of reconnection, and avoidance reactions to the facial expressions. The participants were presented with stimuli of neutral and happy faces. To gauge how rapidly the

desire to approach or avoid is deployed, the subject's reaction time in moving the stick figure was recorded to each face.

The happy and neutral faces were sourced from the Chicago Face Database (CFD) (Ma et al., 2015). The faces were all fit in a window of 500 x 600 pixels, and were 32-bit color. The faces were 72 high-resolution photographs of 36 male and 36 female individuals between the ages of 17-65. The happy and neutral faces were of the same person, so they did not differ in any visual features that could confound the results.

An awareness assessment was developed for the current study to rule out participants who had already been exposed to the task before due to bias. This assessment contained of 4 questions regarding the participants' awareness of the procedure. Such as; "Have you heard of, or played Cyberball before today?", "Were you able to connect and play through the entire game of Cyberball or did technical difficulties prevent it?", "Please indicate to what extent you felt the following emotions during the Cyberball game", "Please indicate how many other players (not including yourself) were playing with you in your game of Cyberball".

The demographic self-report form was used to provide information on our participants for the current study. The participants were provided with questions on their age, gender, ethnicity, race, and sexual orientation.

A 6-item mood measure questionnaire was developed for the current study as a manipulation check. The questionnaire consisted of questions regarding to participant's feelings, and experience throughout the procedure, such as; "Please indicate to what extent you felt the following emotions during the Cyberball game".

Procedure

The study began with participants giving electronic informed consent, and completing a demographics form. They were then presented with the Fear of Negative Evaluation Scale (FNES) consisting of 12 questions. Following the FNES, they were directed to Qualtrics to play a game of Cyberball. The Cyberball game runs for roughly 3 minutes and involves three cartoon computer automated participants that play a game of toss. In the excluded condition, the other players do not throw the ball to the participant after the first two throws. In the included condition, the other players throw the ball to the subject and accept them. After Cyberball, they completed a 6-item mood measure questionnaire as a manipulation check (those who were rejected were expected to report feeling sad, those who were included should report a positive mood.) Participants were then provided with another short questionnaire asking the subjects if they had any previous knowledge of Cyberball, and if they had paid attention throughout the procedure. (Participants with prior experience to Cyberball will be excluded from the data due to bias.) The participant was then directed to click on a link that forwarded them to the AAT. Based on prior information participants provided in the demographics questionnaire, they were exposed to either all male or all female faces based on their sexual orientation. (For example, heterosexual males do the AATs with male faces only so that physical attractiveness of the faces can't confound approach/ avoidance responses.) The task started with a practice run consisting of ten trials which prepares the participant and allows them to get the hang of the task. They were instructed to move the keys "Y" (to approach) and "B" (to avoid) to move up and down when they are presented with a face. Following the practice run, participants then engaged in two AAT tasks. In the first AAT, the participant was instructed to approach happy faces and avoid neutral faces. In the second AAT, they avoided happy faces and approached neutral faces. Participants then completed a brief awareness assessment involving a series of funneled questions that

determined if excluded participants were aware of their motive to reconnect. The subject was then presented with a debriefing form which provided them with information about the entire study, the specific hypothesis, and why people were included and excluded during the Cyberball task.

Results

Figure 1 shows the effects of Cyberball on approaching and avoiding happy versus neutral faces. A 2 x 2 x 2, Group (Excluded or Included between-subjects) x Face (Happy and Neutral, within-subjects) x Response (Approach and Avoid, within-subjects), mixed ANOVA was used to test the hypotheses. There were no outliers in terms of approach or avoidance reaction times. The main effect of Group was not significant, $F < 1, p = .865$, indicating that subjects who were excluded did not respond faster than those included. The main effect of Face was not significant, $F(1, 32) < 1, p = .440$, indicating that participants did not respond to happy faces faster than neutral faces. The main effect of Response was significant, $F(1, 32) = 6.45, p = .016$, meaning that across both groups and for both types of faces, the participants approached the facial stimuli faster than they avoided them. The three-way interaction of Group, Face, and Response was not significant, $F(1, 32) = 2.05, p = .162$, which is not consistent with the hypothesis. However, with a small N, this interaction appears to be trending in the expected direction, as shown by its effect size, $\eta^2 = .075$, and the analyses below.

We tested our specific hypothesis in a 2 x 2, Group x Face, ANOVA of approach response times. The two-way interaction of Group and Face for Approach responses was not significant, $F(1, 32) = 2.58, p = .118, \eta^2 = .085$ (Cohen's $d = .55$). However, this interaction is trending in expected direction, and the effect size is moderate. As shown by the means in Figure 1, this potential interaction effect indicates that excluded participants are

trending towards approaching happy faces faster than neutral faces relative to included participants. In the same 2 x 2 ANOVA for avoidance responses, the corresponding two-way interaction of Group and Face was far from significant, $F < 1$.

Discussion

This study investigated social approach and avoidance behavior in response to ostracism by Cyberball. The participants were randomly assigned into one of two groups: half of the subjects were excluded, and the other half were included as a control group. Following the Cyberball exposure, subjects then did the AAT and were instructed to approach and avoid happy and neutral facial expressions. The response times of participant's reactions to the faces were recorded to measure if the excluded participants approached the happy faces faster than the neutral faces.

Collectively, individuals approached faces faster than they avoided faces. This indicates that humans, regardless of being excluded or included, have a naturalistic response to approaching rather than avoiding contact with others. Although the hypothesis was not confirmed- the two-way interaction of Group and Face for approach response did not achieve statistical significance, we observed a statistical trend in the direction of our hypothesis. Moreover, the effect size of this trend was moderate. The corresponding interaction for avoiding faces, however, was far from significant. Together, this pattern may indicate that with a larger sample, our hypothesis may be supported. That is, the two-way interaction of Group and Face for approach response may achieve statistical significance. Consistent with this interpretation, a G*Power analysis found that if the observed trends are maintained with the same effect size, only 5 more participants would be needed for this interaction to attain statistical significance at $p = .05$.

If the observed trends attain statistical significance with a larger sample, those results would suggest that excluded individuals approached happy faces faster than included individuals. The desire to connect following social exclusion would be demonstrated automatically. Theoretically, this would expand research on social connection in a new direction: towards the unconscious dimension of the need to reconnect, showing the need to reconnect runs deep. This desire to belong would be involuntarily exhibited and speak to our fundamentally social nature as human beings. We need each other, especially after exclusion.

These results are consistent with the various studies reviewed earlier that showed social exclusion has a direct effect on the motivation to belong. Lankin, Chartrand, and Arkin's (2008) study tested reconnection through unconscious mimicry. The study provided results showing that individuals who were rejected during Cyberball attempted to reconnect with new individuals that did not exclude them through unconscious foot-tapping behaviors. The findings of Lankin, Chartrand, and Arkin's study is correlated with our study because the subjects were unknowing of how fast they were responding to the faces that were exposed to. Therefore, the current study may show that the motivation to reconnect is shown through automatic and unconscious actions. The reason why we used the AAT is so we could measure aspects of the motive to reconnect that we cannot measure in real life. The AAT investigates the automatic behavioral response of reconnection: measuring such reaction times has provided us with the information we need to study social reconnection at a deeper, unconscious level of processing. Despite the fact that the hypothesis of the current study was not confirmed, we were able to gather potentially meaningful results from a much smaller sample size than anticipated.

Limitations and Future Directions

The current study was originally planned to be conducted on the internet utilizing Prolific to recruit participants. We expected a sample size of 200 participants. Due to technical difficulties during the operation of the AAT, we had to move our procedure to an in-person laboratory for participants. This allowed researchers to have more observation over participants during the procedure. We collected a sample size of 34 participants, a fraction of what was expected. Every participant counts when working with a sample size this minute. Following running participants in the laboratory, 4 participants' data was not stored on the computer and was eradicated. This occurred because Campus Technology Services does not allow researchers to gather data in one, centralized location. Each student researcher has their own computer profile where their data is saved. One student's data was saved to her profile and then somehow eradicated. The way to address this limitation in the future is for psychology research laboratories to be given a guest account in which all data collection occurs, as this is commonly the case in standard scientific research laboratories. Given the smaller sample size, we experienced an obvious setback in our data collection pool of subjects. The direction and pattern of the results and size of the relevant effects suggests that with a larger sample we may have achieved the statistical significance needed to support our hypothesis.

Another limitation of the study was that the AAT measure lacks ecological validity. Unlike previous studies, the AAT does not evaluate the desire to actually connect with potential new social partners in real-life. However, the AAT allows researchers to test hypotheses that are difficult to test in a real-life setting regarding automatic approach responses. Cyberball also lacks ecological validity, Cyberball exclusion from a virtual game of catch with cartoon characters is not at all similar to the experience of actual exclusion orchestrated by real people in life.

However, it would be unethical to conduct a study that utilizes real individuals ostracizing others.

In future studies, one way to alter the limitations of participants lacking exposure to reconnecting with an actual person would be to involve an in-person interaction component following Cyberball. By involving the post-Cyberball interaction, it could allow researchers to compare the results of the in-person, and the virtual desire to reconnect following rejection. Future studies utilizing the AAT can also be expanded on by employing other types of facial expressions such as sadness, disgust, or lust to study unconscious emotional processing. It would be interesting to see if people prefer to reconnect not just with a smiling face, but those showing other emotions as well. Some individuals may feel more inclined to approach facial expressions showing lustful facial expressions faster due to attraction, or have faster avoidance times for faces portraying disgust. There could even be a dynamic found where those who are unhappy may gravitate towards other unhappy individuals.

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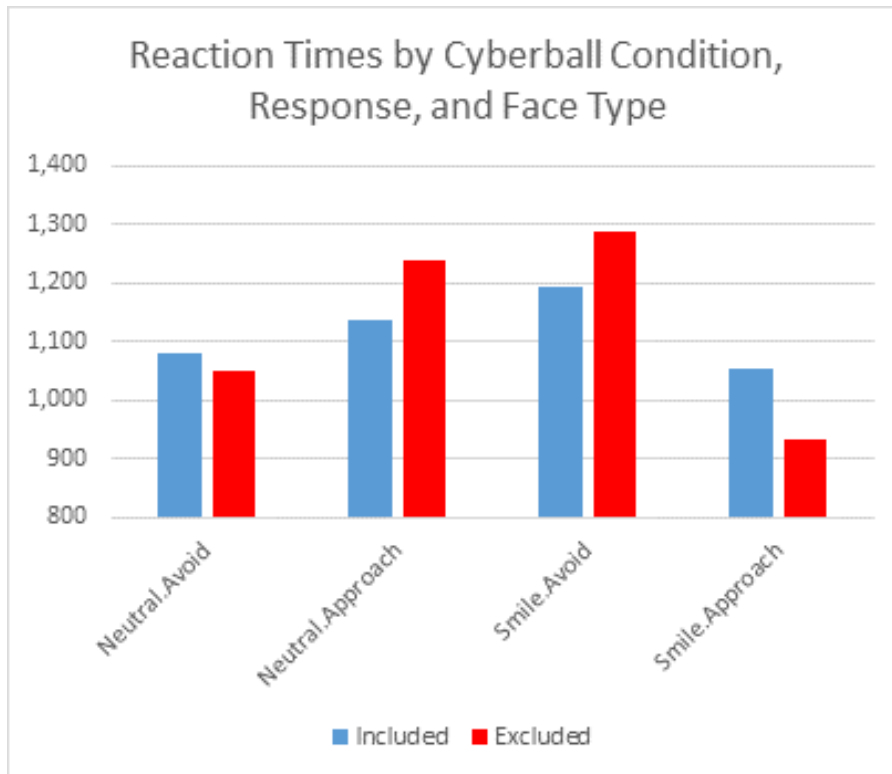


Figure 1. Mean reaction times for approaching and avoiding the happy and neutral faces in the excluded and included groups.