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The Influence of Social Norms upon Behavioral Expressions of Implicit and Explicit Weight-Related Stigma in an Interactive Game

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This research explored the roles of social influence and stigma-related attitudes in how people behaved toward an overweight female in an interactive computer game. Photographs were used to manipulate whether one of the players in the game was overweight or average weight. We found that both explicit and implicit anti-fat attitudes influenced interactions with an overweight player, but only when other players ostracized the overweight player, not when they included her. Under conditions of ostracism, explicit attitudes were better predictors of more controllable behaviors, while implicit attitudes were better predictors of more automatic behaviors.

Being overweight is simultaneously one of the more pervasive [1] and negative of all stigmas [2]. People commonly hold both implicit and explicit negative weight-related attitudes [3,4,5,6,7,8,9,10]. Implicit weight-related attitudes are spontaneous evaluative responses that are evoked when people encounter someone who is noticeably overweight. Psychologists have assessed implicit attitudes through a variety of indirect measurement techniques [11,12]. Explicit weight-related attitudes, on the other hand, are commonly assessed directly though self-reports [13]. Though both tend to be negative, implicit and explicit weight-related attitudes are often uncorrelated [9].

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†Abbreviations: NTBI, number of tosses before inclusion index, HGI, hesitation given inclusion index; CNT, cumulative number of tosses; AMP, Affect Misattribution Procedure; GLM, general linear model; IMCP, Internal Motivations to Control Prejudice; JSM, justification-suppression model.

Keywords: weight-related stigma, ostracism, implicit attitudes, social interaction

A number of factors are known to moderate the relationship between implicit and explicit attitude measures. For example, implicit and explicit attitude measures are more likely to correspond when self-presentation concerns are low, the evaluative strength (potency and importance) of the attitudes is high, the structural qualities (dimensionality) of the attitudes are consistent, and when the evaluative reactions to the attitude object are interpersonally distinctive [14,15]. In addition, dual process frameworks suggest that the dissociation between implicit and explicit attitude measures can occur because they assess two structurally separable components of attitudes [16,17,18]. Measures of implicit attitudes are theorized to reflect an associative representation that can be automatically activated by information that brings the attitude object to mind. On the other hand, measures of explicit attitudes are thought to tap a propositional representation derived from higher order deliberative processes [19].

Consistent with the dual process framework, research suggests that implicit and explicit attitudes are likely to be related to different types of social behaviors [11,20]. Whereas implicit attitudes tend to be related to spontaneous behaviors that are less likely to be consciously controlled, explicit attitudes tend to be related to deliberative behaviors representing people's conscious choices.

While associative and deliberative processes may drive psychological reactions to stigmatized persons, such reactions often unfold in the context of social influence. Social norms conveyed by observing the behavior of others can powerfully influence the likelihood of expressing prejudiced behaviors [21]. Specifically, people generally notice and adhere to local norms of fairness/reciprocity in everyday social interaction [22]. Thus, if other people treat the stigmatized person no differently from others, one's personal attitudes toward the stigma might be less likely to be expressed in social behavior. Such attitudinal inhibition could occur even if one were personally repulsed by the stigmatized person.

But what about the case where one observes others mistreating a stigmatized person? Two processes may come into play. First, seeing others arbitrarily mistreat a stigmatized person is likely to violate people's sense of fairness. People might then attempt to compensate the victim for the mistreatment [23]. Second, one's own attitude toward the stigmatized person might affect the extent or manner in which such compensation occurs. Thus persons with relatively more negative attitudes might be more reluctant to compensate the victim. In fact, seeing other people treat a stigmatized person in a negative manner could disinhibit a person's negative behavioral reactions to the stigma [21,24]. For example, Sechrist & Stangor [25] found that while higher prejudiced participants sat at a greater distance from an African American confederate than did lower prejudiced participants, the avoidance tendencies of high prejudiced people was heightened when the participants learned that their attitudes were shared by a clear majority of other individuals.

In the current study, we manipulated a type of mistreatment that is commonly experienced by stigmatized persons: ostracism or social exclusion [26]. Specifically, we observed participants' behavioral reactions to a stigmatized person in a computer ball tossing game called Cyberball [27,28]. Ostracism — being ignored and excluded — has been found to thwart fundamental needs of belonging, self-esteem, control, and meaningful existence, and it elevates negative affect [29]. Reports of childhood ostracism predict behavioral and psychological problems in adolescence above and beyond reports of bullying [30]. Further, only a few minutes of Cyberball-induced ostracism activates the region of the brain that detects physical pain [31]. Even observing an individual who is being ostracized results in similar negative responses in the observer [32]. Typically, participants playing a virtual ball toss game strive to achieve equality for inclusion by compensating under-thrown players [33].

We examined how implicit and explicit weight-related attitudes influenced different

facets of playing Cyberball when one of the players was perceived to be overweight. In addition, we varied a social influence factor by having the other players either include or ostracize the overweight player. We hypothesized that an explicit weight-related measure of attitude would be associated with aspects of game play that reflect conscious, deliberative choices, but only when the overweight target person had been ostracized by the other players. In particular, we expected that explicit weight-related attitudes would be associated with the number of rounds the participants waited before deciding to throw the ball to the stigmatized person. Participants seem likely to be highly aware of when they first begin to throw to the stigmatized person. Hence, we expected that this behavior would be linked to explicit attitudes and deliberative processes. We will refer to this measure as the number of tosses before inclusion index (NTBI†).

On the other hand, other aspects of game-playing behavior are likely to be more spontaneous and less deliberate. For example, even though participants include a stigmatized target, they may nevertheless hesitate before making a throw. We refer to this time delay as the hesitation given inclusion index (HGI). We expected that hesitation might be difficult to control, and therefore, it should be related to implicit weight-related biases.[1] Once again, however, we expected this relationship to hold only when the target person had been ostracized by the other players.

In summary, we hypothesized that the display of fairness norms (equal inclusion) by other players would powerfully influence participants to include overweight players, thus eliminating any potential effect of stigma upon game-playing behavior. Alternatively, the exclusion of an overweight player by others was expected to disinhibit the expression of weight-related biases. Under exclusion conditions, explicit weight-related attitudes were expected to predict deliberatively controlled behaviors and implicit weight-related attitudes were expected to predict spontaneous or less controlled behaviors.

METHOD

Participants

One hundred undergraduates from a large Midwestern university volunteered to participate in this study in exchange for extra credit in Psychology courses. Data from two participants were eliminated for their failure to follow instructions and from two additional participants because they were suspicious about the alleged presence of other participants. Sixty percent were female. Seventy-six percent were White/Non-Hispanic, 10 percent were Black/African American and the rest were other racial/ethnic groups. The average age was 19.62 (SD = 1.42).

Procedures

Students participated individually but were led to believe that they would be playing an online computer game with three other students who were present in other rooms of the Psychology lab complex. They first were asked to complete a general, personal information sheet (asking first name, hometown, major, favorite television show, etc.) and to have a digital photograph taken. The experimenter then exited and after a brief delay returned to present participants with three completed information sheets from the "other participants." Clipped to each sheet was a black and white participant photo. Participants were asked to look over these sheets and photos "to get to know something about the other

[1]Pilot research conducted in our labs explored whether participants were aware of the number rounds they had waited before including a player that others excluded and whether they were aware of having hesitated in throwing the ball to the ostracized player [49]. Consistent with the notion that the number of tosses before inclusion represents a controlled behavior, participants' estimates immediately following a Cyberball game were significantly correlated with the actual number of tosses before inclusion during the game, $r(97) = .33$, $p < .01$. Consistent with the notion that hesitancy during inclusion represents a more automatic behavior, participants' estimates of the degree to which they hesitated were not correlated with their actual hesitancy, $r(103) = .10$, $p = .16$.

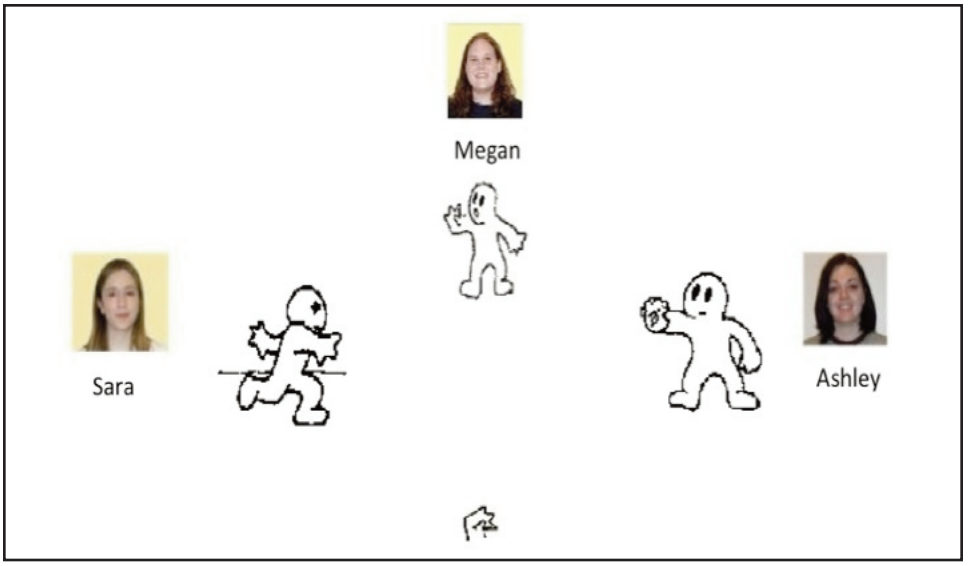

Figure 1. Screen from the Cyberball Game.

players." All three of the "other participants" were White women. These photos were all frontal shots showing the women from just above their knees to the tops of their heads.

Participants were randomly assigned to one of two weight status conditions using a random number table. For approximately half of the participants, one of the three photos was of an overweight woman while the other two were of normal weight women. For the other half, all three of the photos were of normal weight women. To manipulate the weight status of one of the players, photographs of two college-aged, normal weight women were digitally altered so that their faces were combined with the bodies and heads of two overweight women. These two pairs of photos were used as stimulus replications in the weight status manipulation.[2]

Cyberball

After viewing the information sheets and photos, the participants sat in front of an eMac computer and received instructions on playing a Cyberball game [34]. Cyberball was described to the participants as a mental visualization task where participants were asked to imagine playing an actual game of "catch" with the other participants. In Cyberball, an animated ball is tossed from person to person on a computer screen. In these four-person games, the other three people were represented onscreen by three animated "Cyberboy" figures. Above or to the side of each figure was a head-shot photo of each player along with her first name (Figure 1). The participants were represented on the screen by a hand at the bottom of the screen. Participants were told others could see their picture, but they would not see their own picture on the screen. Players were arranged in a circle on the screen. Play began with the person to the left tossing the ball. When the participants received the ball, they could elect to toss it to any of the other players by clicking on the photo of the person with the computer mouse.

The other three players were "virtual confederates," as their play was pre-pro-

[2]These same photos were used to manipulate weight status in Graziano, Bruce, Sheese, and Tobin [50]. Pre-test ratings reported by Graziano and his colleagues indicated that the weight of the normal weight body photographs (M = 2.20, SD = 0.62) was perceived as less than that of the overweight body photographs (M = 3.50, SD = 0.76), $t(19) = 7.30$, $p < .001$. We asked four independent judges (two men and two women) to estimate the height and weight of the woman in each photo. From these estimates, we found that the BMI of the normal weight women (M = 20.86, SD = .63) was perceived as less than that of the overweight women (M = 27.36, SD = .90), $F(1,3) = 126.28$, $p < .01$, $\eta^2 = .98$. These two perceived BMI estimates fall into the realms of *normal weight* and *overweight,* according to CDC norms.

grammed by the experimenter. The Cyberball game was programmed to carry on for 60 ball tosses. For our programming purposes (unbeknownst to participants), we designated one of the three confederates the Target Player, while the other two were designated Other Player 1 and Other Player 2, respectively. Using the photographs described above, we manipulated the weight status of the Target Player (normal weight vs. overweight), while the other two players were always normal weight women. Two different women alternated as the Target Player. The Target Player's position on the screen (to the left of the participant's virtual hand, to the right, or across) was counterbalanced across participants. Participants were randomly assigned to an ostracism or inclusion condition. In the ostracism condition, Other Player 1 and Other Player 2 threw the ball once to the participant, twice to each other, and once to the Target Player during the first four times they received the ball. After that, they alternated randomly throwing to each other or the participant and never again threw the ball to the Target Player. The Target Player randomly alternated throwing to each of the other three players throughout the game. In the inclusion condition, the Target Player and the other two confederates randomly alternated among all of the players in their tosses throughout the game.

The Cyberball program records two streams of information throughout the game. The first is which player receives each toss. The second is the computer clock time at the point the ball is received. From these records, we derived three behavioral indices: the number of tosses before inclusion (NTBI), hesitation given inclusion (HGI), and the cumulative number of tosses (CNT). The first time the participants received the ball from another player, they could choose to toss the ball to the target or one of the other players. A NTBI index was scored 0 if the participants tossed the ball to the target at the first opportunity. The NTBI index was scored 1 if participants waited until the second time they caught the ball to toss to the target, 2 if they waited until the third time, and so on. Thus, the NTBI index reflects participants' conscious choices of when to begin including the target in the game.

The second behavioral index, the HGI, represents the average latency across trials in throwing the ball to the target player. Latency scores were derived from subtracting the clock time when the participant received the ball from the subsequent clock time when the next player received the ball. Hesitating when throwing the ball to a target person is a subtle behavior and would seem unlikely to be consciously controlled by participants. Only latency scores involving the target as recipient of the ball contributed to the HGI index.

The third behavioral index derived from Cyberball toss records was the cumulative number of tosses (CNT) to each player from the participants across the entire game. This variable has similarities and differences to the other variables. For example, whereas NTBI represents a discrete choice of when to include the target person, the summary number of tosses to each player accumulates across the entire game. While participants might have a general sense of how many times they toss the ball to each player, they are unlikely to keep any specific conscious track. Thus, CNT might be influenced by both spontaneous and deliberative processes.

Immediately following the Cyberball game, participants were asked to complete several ratings about their reactions to the Cyberball game modeled after the research of Zadro and her colleagues [34]. These included a manipulation check of participants' estimates of how many times each player received the ball.

Implicit Measure of Anti-Fat Attitudes

Following the Cyberball game, an Affect Misattribution Procedure (AMP) [35] was used to assess participants' implicit anti-fat attitudes. Sixty Chinese pictographs used in the Payne et al. research were also used in this version of the AMP.[3] Participants were told that the purpose of the task was to guess the general affective meanings of a series of Chi-

[3]The authors wish to thank B. Keith Payne for providing these Chinese pictographs.

nese pictographs. Each pictograph appeared on a computer screen for one second, followed by a screen instructing participants to rate the pictograph's general affective meaning on a -3 to +3 pleasantness scale. There was no zero or midpoint on the scale. Thus, participants were forced to choose either a positive or a negative meaning. Participants were given as much time as they needed to make their ratings and then they hit the space bar to advance the screen. Before each Chinese pictograph, a color photo of a woman appeared for one second. Participants were told that these "real life images" simply signaled that the pictograph was about to appear and to "do nothing with them." For this version of the AMP, before and after photographs of 30 women (29 White women and 1 Asian woman) were collected from a commercial weight loss website. Thus, there was an overweight and thinner photo of each woman. Each of the first 30 Chinese pictographs was preceded by the photo of a different woman. For each woman, either the overweight or thinner photo was randomly selected. Each of the second 30 Chinese pictographs was preceded by one of the remaining photos. So, in summary, the participants went through the same 3-slide sequence 60 times: signal photo (overweight or thin woman), Chinese pictograph, and then rating slide. Two independent judges (undergraduate women who were not involved in the research) were asked to rate each of the 60 photos on a fat/fit scale ranging from -3 to +3. Their ratings were averaged, and the lower and upper quartiles of these ratings were used to select the most overweight and fittest photos. These photos were used in the AMP computations to be described below.

Explicit Measures

Following the AMP, participants completed a packet of questionnaires. Of primary concern was a feeling thermometer measuring participants' general attitudes toward obese women on a 0 to 100 scale [36,37]. This feeling thermometer was embedded in a series of similar ratings for different stigmatized groups (e.g., obese men, mentally ill women, mentally ill men, etc.). In the questionnaire packet, participants also were asked to rate the degree to which they agreed with five statements concerning the degree to which overweight people are responsible or to be blamed for being overweight: "Fat people deserve to be made fun of," "Most fat people just lack self-control," "Most overweight people are to blame for being fat," "Most overweight people are lazy," and "If you are overweight, it is your own fault." These items were averaged to construct a Blame scale (α = .89).

Also included in the questionnaire packet were the Internal and External Motivation to Control Prejudice against Obese People scales (α =.83 and α =.69, respectively) adapted from the work of Plant & Devine [38] and various demographic measures. Finally, participants asked to describe their own body weight on a 1 to 5 scale with the end points of "underweight" and "overweight." At the end of the explicit measures, participants were debriefed. While none of the participants indicated that they suspected that the research was concerned with weight status during either the Cyberball game or the AMP, almost all said that by the end of the explicit measures, they suspected that reactions to overweight people was possibly a topic of study. This is not surprising, considering the number of questions toward the end of the procedures that explicitly asked participants about their attitudes and beliefs concerning overweight people.

RESULTS

As a manipulation check, participants were asked to estimate the percent of throws the target player received. As predicted, the participants estimated that the target received the ball more often in the Inclusion conditions than in the Ostracism conditions (M = 26.62, SD = 1.36 vs. M = 19.63, SD = 1.40; $F(1,91) = 12.89$, $p < .01$, $\eta^2 = .08$).

Implicit and Explicit Anti-Fat Attitudes

Means were computed for the ratings of the 14 Chinese pictographs following the photos of the most overweight women (α = .76) and for the ratings of the 18 Chinese pic-

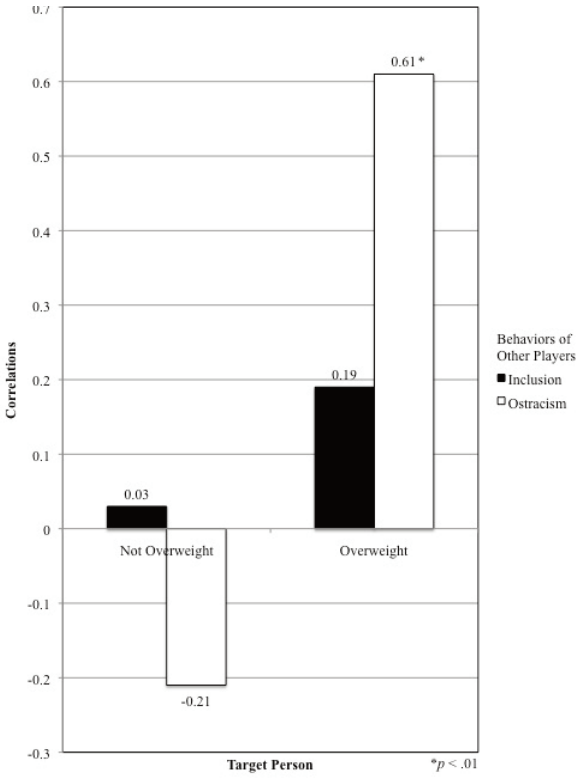

Figure 2. Correlations between Number of Tosses before Inclusion and Explicit Anti-Fat Attitudes across the Ostracism and Weight Conditions.

tographs following the photos of the fittest women α = .71) — the lower and upper quartiles of the fat/fit distribution described above. A comparison of these two means across the sample revealed that those pictographs that followed the most overweight women (M = -.025, SD = .839) were rated as generally less pleasant than those following the fittest women (M = .475, SD = .776); $t(95) = 5.68$, $p < .01$). Thus, our sample like many others [9] showed a general implicit weight bias. Subtracting the overweight mean from the fit mean formed an Implicit Weight-Related Attitude index. Thus, higher scores represent more negative weight-related attitudes.

The feeling thermometer ratings for obese women were reverse scored so that higher numbers represented more negative explicit weight-related attitudes. The implicit and the explicit measures of weight-related attitudes were not significantly correlated, $r(96) = .11$, $p = .30$. Explicit attitudes did not correlate with either the overweight or fit component of the implicit attitude index, $rs(96) = .00$ & $.11$, *NS*. An Ostracism Condition (inclusion vs. ostracism) × Weight Condition (normal weight vs. overweight target) × participant gender ANOVA revealed no significant effects for either the implicit or the explicit weight-related attitude index. This finding is consistent with the notion that these attitude measures represent individual differences and were not affected by the manipulations.

Cyberball Behavior — Delaying Inclusion

The first analysis of game-playing behavior focused upon participants' delays in including the target or how many times they chose to toss to the ball to other players before tossing it to the target. As indicated above, these delays were theorized to reflect deliberative choices, and thus, we hypothesized that they would be related to explicit attitudes that the participants held about the target's weight status. The NTBI (number of tosses before inclusion) index scores were analyzed using a general linear model (GLM), where Ostracism Condition (inclusion vs. ostracism) and Weight Condition (normal weight vs. overweight target) were categorical between-participant factors, and implicit and explicit weight-related attitudes were continuous between-participants predictors (analogous to covariates).[4] There were several statistically significant effects. Of primary theoretical importance was the Ostracism Condition × Weight Condition × Explicit Attitude interaction, $F(1,84) = 5.85$, $p < .01$, $\eta^2 = .02$. Table 1 shows the means across the Ostracism and

[4]Preliminary analyses indicated that participant gender was not an important variable in any of the analyses of ostracizing behavior. None of the reported analyses include gender as a variable.

Table 1. Means and Standard Deviations of the Primary Dependent Measures across the Ostracism and Weight Conditions.

	Inclusion		Ostracism	
	Not Overweight	Overweight	Not Overweight	Overweight
Measure	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Number of Turns Before Inclusion	1.49 (2.06)	0.96 (1.08)	1.32 (1.04)	1.70 (2.03)
Hesitation Latencies Given Inclusion*	3525.45 (797.06)	3384.77 (436.35)	3490.36 (541.02)	3607.26 (872.03)

*Note: Hesitation is represented in milliseconds.

Weight conditions. Figure 2 shows the correlations between the NTBI index and explicit weight-related attitudes across the four conditions. The Ostracism Condition × Weight Condition × Explicit Attitude interaction was produced by a strong correlation between explicit attitudes and NTBI in the condition where other players ostracized an overweight target person. Here, participants who held explicit negative weight-related attitudes were more likely to delay in choosing to include the overweight target. Note that Implicit Weight-Related Attitudes did not interact with Ostracism and Weight Conditions and that a breakdown of the correlations involving the Implicit Attitudes and the NTBI index revealed no significant correlations. Thus, explicit, but not implicit, attitudes were correlated with decisions of when to begin tossing to the overweight player, and the explicit attitude/NTBI correlation only emerged when other players were excluding the overweight person.

Cyberball Behavior — Hesitancy

Whereas choosing to prolong the exclusion of the target from the game was theorized to reflect deliberative processes, pausing or hesitating while holding the ball before tossing it to the target was theorized to reflect a more subtle or less consciously controlled indication of ostracism. HGI (hestinacy given inclusion) scores were also analyzed using a general linear model (GLM), where Ostracism Condition (inclusion vs. ostracism) and Weight Condition (normal weight vs. overweight target) were categorical between-participant factors, while implicit and explicit weight-related attitudes were continuous between-participants predictors. Of theoretical importance was an Ostracism Condition × Weight Condition × Implicit Attitude Interaction, $F(1,84) = 13.21$, $p < .01$, $\eta^2 = .14$. Table 1 shows the HGI scores across the Ostracism and Weight Conditions. Figure 3 shows the correlations between the Implicit Weight-Related Attitudes and the HGI scores across the four experimental conditions. Participants with greater implicit weight-related bias were more hesitant in tossing the ball to the overweight woman when the other players were ostracizing her. On the other hand, participants with greater implicit weight-related bias also were less hesitant in tossing the ball to the normal weight person when the other players were ostracizing her. The other side of the coin in weight-related bias may be an enhanced positive treatment of people who are fit. In inclusion conditions, implicit weight-related attitudes made no difference. Note that Explicit Weight-Related Attitudes did not interact with Ostracism and Weight Conditions and that a breakdown of the correlations involving the explicit attitudes and HGI scores revealed no significant correlations. Thus, implicit, but not explicit, attitudes were correlated with hesitancy in tossing to the overweight player, and the implicit attitude/hesitancy correlations only emerged when other players were excluding the target person.

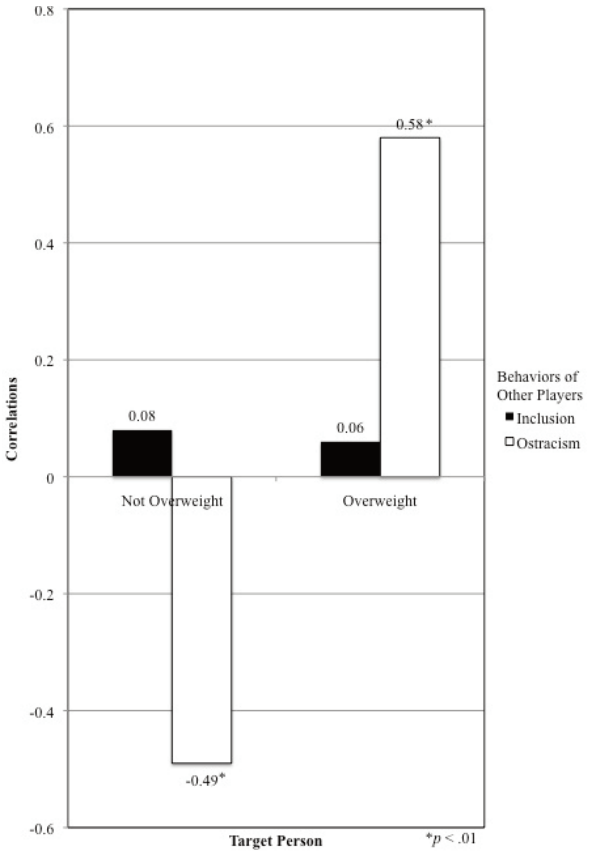

Figure 3. Correlations between Hesitation Latency to Toss to the Target and Implicit Anti-Fat Attitudes across the Ostracism and Weight Conditions.

Cyberball Behavior — Number of Tosses

With regard to the third behavioral index, CNT (cumulative number of tosses), an initial analysis included the implicit and explicit attitude measures as continuous variables as in the previous analysis. However, neither of these attitude measures proved to be related to the number of tosses to either the target or the other two players. Because these two variables were not involved in any statistically significant effects, they were dropped from further consideration. An Ostracism Condition × Weight Condition × Player ANOVA was conducted where Player was a within-participants variable representing the cumulative number of times the participants threw the ball to the target player and the two other players across the game.[5] This analysis revealed two significant interactions: a Player × Ostracism Condition interaction and a Player × Weight Condition interaction, $F(2,184) = 8.91$, $p < .01$, $\eta^2 = .09$ and $F(2,184) = 3.39$, $p < .04$, $\eta^2 = .04$, respectively.

With regard to the Player × Ostracism interaction, contrasts revealed that participants threw the ball more to the target person when she was ostracized by others ($M = 6.43$, $SD = 1.47$) than when she was included by others ($M = 4.59$, $SD = 1.08$); $t(94) = 6.99$, $p < .01$. To a lesser extent, participants also threw the ball somewhat more to the confederate in the counter-clockwise position to the target in the Ostracism Condition than in the Inclusion Condition; $M = 5.45$, SD = 1.28 vs. $M = 4.90$, $SD = 1.14$, $t(94) = 2.22$, $p < .03$. Tosses to the remaining player did not vary across the Ostracism Conditions; $M = 5.53$, $SD = 1.30$ vs. $M = 5.47$, $SD = 1.21$, $t(94) < 1$, *NS*.

With regard to the Player × Weight interaction, contrasts revealed that although participants threw the ball less to the target when she was overweight than when she was normal weight ($M = 5.23$, $SD = 1.57$ vs. $M = 5.75$, SD 1.55), this difference did not achieve statistical significant; $t(94) = 1.63$, $p = .11$.[6] In summary, these analyses of the

[5]Cyberball incorporates some random factors in the play of the virtual confederates. As a result, the number of times that the participant receives and has the opportunity to throw the ball varies across participants. One way to equate analyses for throwing opportunities is to use the percent of the times participants threw the ball to each of the other players as the dependent variable. Using this dependent variable did not alter any of the findings reported here.

[6]Participants did throw the ball somewhat more to the confederate in the counter-clockwise position to the target in the Overweight Target Condition than in the Thin Target Condition, $M = 5.46$, $SD = 1.24$ vs. $M = 4.88$, $SD = 1.18$, $t(94) = 2.37$, $p = .02$. Tosses to the other player did not vary across the Weight Conditions, $M = 5.40$, $SD = 1.48$ vs. $M = 5.60$, $SD = 0.96$, $t(94) < 1$, *NS*.

Table 2. Correlations of Implicit and Explicit Anti-Fat Attitudes to Other Measures.

	Implicit Attitudes	Explicit Attitudes
Blaming Fat People	0.17	0.31*
Internal Motivation to Control Prejudice	-0.12	-0.31*
External Motivation to Control Prejudice	-0.18	-0.03

*p < .05

number of tosses to each player generally showed that participants tried to compensate for the ostracism of other players by increasing their tosses to the ostracized player. They also tended to throw somewhat less to an overweight player and more to at least one of the normal weight players when an overweight player was present.

Ancillary Measures

Explicit Weight-Related Attitudes are thought to be conscious biases that people hold against overweight people. On the other hand, Implicit Weight-Related Attitudes may be construed as more automatic reactions that are less subject to conscious control. In a series of correlation analyses, we explored the hypothesis that Explicit Weight-Related Attitudes would be more strongly related to other measures of consciously held biases against overweight people. Table 2 shows that explicit, but not implicit, attitudes were correlated with tendencies to blame overweight people for their conditions. Also shown in Table 2, Explicit Weight-Related Attitudes were negatively correlated with Internal Motivations to Control Prejudice (IMCP) against Obese People, but not External Motivations to Control Prejudice against Obese People. Similarly, Pryor and his colleagues [39] found that internal, but not external, motivations to control prejudice were correlated with approach/avoidance reactions to stigmatized persons after time for deliberation. In summary, measures that might be construed as relating to conscious biases such as blaming overweight people for their conditions and conscious desires to control weight-related prejudice were related to explicit weight-related attitudes. In contrast, none of the self-report scales were related to implicit attitudes. Finally, the participant's own sense about being overweight was uncorrelated with weight-related attitudes or behaviors.

DISCUSSION

This research supports the idea that social influence can moderate the behavioral expression of both explicit and implicit stigma-related attitudes. When participants were exposed to other players who treated an overweight player no differently from others, participants' weight-related attitudes did not predict their behaviors toward an overweight person. Yet, when participants were exposed to other players who excluded an overweight player, they displayed an interesting mixture of both inclusive and discriminating behavior. On the one hand, they tried to compensate for the exclusionary behaviors of the other players by throwing the ball more times to the overweight player who was being excluded. On the other hand, those with negative explicit weight-related attitudes tossed the ball more often to the other players before deciding to include the ostracized player. Also, when other players were excluding the overweight player, those with negative implicit weight-related attitudes were more likely to hesitate or pause on those tosses where they did include the overweight player. This research also supports the idea that people hold both explicit and implicit weight-related attitudes and that these two types of attitudes predict different aspects of their behavior when they interact with someone who is overweight. Explicit attitudes predicted more overt behaviors such as delays in choosing to include an overweight person, while implicit attitudes predicted more subtle behaviors such as hesitancy when they did include the overweight player.

Our research suggests that when people encounter someone being excluded from a Cyberball game, they typically attempt to restore equal treatment to that person by increasing their tosses to the person. Other research in our labs has consistently demonstrated this *ostracism dividend* — or the tendency to treat ostracized people in a compensatory way [33]. In the current study, this normative reaction to ostracism held even when the ostracized person was overweight or stigmatized.

One way to interpret these findings is in terms of the justification-suppression model (JSM) of prejudice [21]. Local descriptive norms — the inclusive behaviors of the virtual confederates — may have encouraged the suppression of weight prejudice. Only when other players openly ostracized an overweight person did weight-related prejudice play some role in participants' behavior toward the overweight person. It is interesting to note that even when there was ostracism of the overweight person by the other players, participants with negative attitudes did not simply conform to this local descriptive norm. Indeed, like other participants, participants with negative weight-related attitudes threw the ball more to ostracized overweight players. Even though their behaviors were inclusive, negative attitudes were expressed in other ways.

The dissociation of explicit and implicit attitudes found in this study is a fairly common finding in the attitude literature [40,41,42]. Fazio's MODE model [43] and other dual process models of attitudes [44,45] suggest that explicit attitudes may be derived from conscious deliberation, whereas implicit attitudes may represent automatic reactions. Consistent with this theory, explicit weight-related attitudes in the current study were correlated with factors that imply conscious deliberations such as blaming overweight people for their conditions and motivations to control prejudice regarding overweight people. Implicit attitudes were not correlated with such factors. Pryor and his colleagues [39] suggested that reflexive reactions to stigmas could reflect past conditioning experiences. Through the mere repetition of pairing "fat" with negative thoughts and feelings, automatic reactions to "fat people" may be common. Consistent with this idea, Petty and his colleagues [42] found that prior conditioning experiences may result in implicit attitudes that are inconsistent with subsequently formed explicit attitudes. More research is needed to explore the possible origins of implicit weight-related attitudes.

In conclusion, this research demonstrates that Cyberball may be a useful vehicle for studying not only the experience of being ostracized, but the factors that produce behaviors like social ostracism as well. On the surface, a game of ball-tossing, whether in the virtual world or in real life, may seem like trivial behavior. Yet, as Williams and his colleagues have shown, even such a trivial game can tap into people's fundamental needs to belong, feel in control, experience self-esteem, and have a meaningful existence [29,46]. As the current research shows, Cyberball also can tap into complex social and personal factors that underlie how people treat someone with a stigma.

Limitations

The current research helps to elucidate some basic psychological processes that underlie the reactions that people have to overweight people in social situations. However, there are some obvious limitations to the current research. The study involved a relatively small sample of White college age participants reacting to White women who were overweight or typical weight. College age people are less likely to be overweight than people in older age groups. Thus, being overweight might be considered to be more deviant and hence more stigmatizing in this population. That the other virtual players were all of typical weights also might have enhanced the salience of the target's weight status as well. In addition, research has shown that being overweight is generally more stigmatizing for White women than it is for women of other racial/ethnic groups such as Black women [47]. So, one must be careful in presuming that the results would generalize across different racial/ethnic

groups. Finally, weight biases are often more evident in reactions to women than they are in reactions to men [48]. Future studies might examine how our findings generalize across varying targets among varying populations.

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