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The effect of objectification on aggression☆

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ABSTRACT

Do people become more aggressive when they are manipulated as a tool or object that can help others achieve performance goals? Adopting a multi-method approach with Eastern and Western samples, through six experiments (overall valid $N = 1070$), we tested whether objectification (i.e., being treated as an instrument that aids others in achieving instrumental performance goals) promotes aggression through thwarted perceived control. The results showed that objectified participants had higher levels of aggression than nonobjectified participants (Experiments 1 to 6). Moreover, thwarted perceived control mediated the effect of objectification on aggression (Experiments 3 and 4). In addition, restoring objectified people's perceived control could effectively weaken their aggression level (Experiments 5 and 6). Taken together, these findings highlight the critical influence of perceived control in explaining when and why objectification promotes aggression and how to weaken such an effect. They also highlight the role of perceived control in understanding the consequences of various forms of interpersonal maltreatment in different performance or instrumental settings.

1. Introduction

Objectification refers to being treated as an object that can be instrumentally manipulated to achieve instrumental goals (Gruenfeld, Inesi, Magee, & Galinsky, 2008; Volpato, Andrighetto, & Baldissarri, 2017). Previous objectification research has mainly examined how sexual objectification affects women (e.g., Breines, Crocker, & Garcia, 2008; Noll & Fredrickson, 1998). Little research effort has been devoted to examining the effects of nonsexual objectification in performance-related settings on people's psychosocial functioning. Because people can experience nonsexual objectification in different interpersonal settings in daily life, it is important to examine its psychological and behavioral impacts. To fill this knowledge gap, in the current research, we examined the effect of nonsexual objectification on aggression and the underlying psychological process.

Humans have an innate need to master their destiny and actualize their potential (Deci & Ryan, 2000; Ryan & Deci, 2000). Objectification unjustifiably deprives people of such a fundamental need because objectified people are treated as mere tools that aid others to achieve performance goals, and their needs and opportunities are exploited (Gruenfeld et al., 2008; Volpato et al., 2017). As a result, objectified people's perceived control may be thwarted. Based on the basic motivation processes (Shah & Gardner, 2007), people should be motivated to behave in ways that can restore their perceived control following objectification. Because aggression can be used as a means to restore control through symbolically asserting superiority and control over others (Baumeister, Smart, & Boden, 1996; Tedeschi & Felson, 1994), we proposed that objectified people may tend to behave aggressively (Experiments 1 to 6), and perceived control may mediate the effect of objectification on aggression (Experiments 3 and 4). Furthermore, we proposed that restoring objectified people's perceived control can weaken their aggression (Experiments 5 and 6).

1.1. The impacts of objectification

Objectification is a prevalent phenomenon in daily life (Holland, Koval, Stratemeyer, Thomson, & Haslam, 2017) and has aroused considerable interest among researchers seeking to understand it, especially from the sexual perspective. For instance, compared with their nonobjectified counterparts, sexually objectified women tend to perceive others as irritating and insincere (Garcia, Earnshaw, & Quinn, 2016) and report lower levels of self-worth, well-being, and life satisfaction (Breines et al., 2008; Jones & Griffiths, 2015; Mercurio & Landry, 2008). Moreover, sexually objectified women are more likely to

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confront the perpetrator (Shepherd, 2019) and engage in disordered eating (Holmes & Johnson, 2017; Noll & Fredrickson, 1998).

Although the literature provides accumulated knowledge about the consequences of objectification, our current knowledge is still very limited because most prior studies focused on sexual objectification (i.e., treating women as objects that satisfy men's sexual desires). Relatively little research effort has been devoted to examining how nonsexual performance-based objectification influences people's psychosocial well-being. In daily social interactions, it is common for people to experience performance-based objectification in different nonsexual domains (Haslam, 2006; Haslam & Loughnan, 2014). For instance, this can occur in the office (e.g., workers treated as mere instruments that aid their superiors to succeed), school (e.g., students treated by their classmates as mere forced riders or note-takers that aid others in achieving good grades), and even families (e.g., parents treat their child as a tool by imposing their own unfulfilled dreams onto their child without considering his or her actual dreams and needs). Past studies have revealed factors that may make people more likely to objectify social targets in performance domains. For example, asymmetry in power position, affluence of money, and peculiar type of task can increase people's tendency to objectify others to achieve performance goals (e.g., Gruenfeld et al., 2008; Teng, Chen, Poon, Zhang, & Jiang, 2016; Wang & Krumhuber, 2017). However, it remains unclear how people respond to objectification in performance-related nonsexual settings. Thus, it is crucial to test how people react when they are objectified in performance and work settings.

In the present research, we aimed to test when and why objectification increases aggressive behavior and how to weaken the effect. We chose to study the effect of objectification on aggression because aggression carries significant implications on interpersonal relationships, life satisfaction, and physical and psychological well-being (e.g., Buss & Duntley, 2006; Griskevicius et al., 2009; Poon & Wong, in press). To increase the generalizability and significance of the current research, we also tested whether objectification would increase people's aggression toward perpetrators of objectification, provocateurs, and innocent strangers. A more holistic and deeper view of how everyday social interactions can trigger different forms of aggression on different target people is important to the advancement of psychological science across various disciplines because knowledge drawn from this line of research has theoretical and practical implications in different domains. In the next section, we offer justifications for why objectification may thwart perceived control, followed by a section in which we discuss why thwarted control would carry direct implications for the effect of performance-based objectification on aggression.

1.2. Objectification and perceived control

Perceived control refers to the belief that an individual is capable of exerting influence on his or her own internal states and external environments (Pagnini, Bercovitz, & Langer, 2016; Wallston, Wallston, Smith, & Dobbins, 1987). Humans have a strong desire to experience control because it allows individuals to choose behaviors that would lead to beneficial outcomes and avoid those that might be harmful or undesirable (Burger, 1992; Leotti, Iyengar, & Ochsner, 2010). We believe that objectification may thwart perceived control. One crucial feature of objectification is instrumentality (Nussbaum, 1999). In the process of objectification, people are included in a social interaction because they are useful and instrumental to others' goal attainments, regardless of other noninstrumental human attributes (e.g., personality, emotions, potential). Consequently, objectified people serve merely as tools that aid others to achieve performance goals, but their autonomy, needs, feelings, and opportunities are often denied (Gruenfeld et al., 2008; Volpato et al., 2017). Indeed, previous research showed that objectified people are perceived as possessing fewer human qualities (Heflick & Goldenberg, 2009; Loughnan et al., 2010; Loughnan, Baldissarri, Spaccatini, & Elder, 2017) and experience disadvantages in developing their career (e.g., getting a desirable job; Smith, Hawkinson, & Paull, 2011; Szymanski & Mikorski, 2016). Therefore, people should perceive a lack of control following objectification because the processes and consequences of their social interactions are manipulated by others rather than controlled by themselves.

Although no prior empirical studies examined the effect of objectification on perceived control, there is indirect evidence supporting this prediction. For example, in one study (Baldissarri, Andrighetto, Gabbiadini, & Volpato, 2017), participants who worked on tasks that carry objectification features (e.g., repetitive, other-directed, and fragmented) reported lower levels of free will than participants who did not work on these tasks. This finding may imply that objectification makes people perceive the lack of ability to make a free and conscious choice. In addition, prior research showed that perceptions of being manipulated by one's foremen in the workplace could positively predict exhaustion (Baldissarri, Andrighetto, & Volpato, 2014).

In sum, no previous empirical research has provided direct evidence that objectification thwarts people's perceived control. However, some preliminary indirect findings suggest this possibility. Therefore, in the current research, we aimed to test whether people have lower perceived control following objectification. In the next section, we explain why thwarted perceived control following objectification may make objectified people more likely to behave aggressively.

1.3. Perceived control explicates the effect of objectification on aggression

People generally desire control (Leotti et al., 2010; White, 1959). Why might perceived control influence the effect of objectification on aggression? Perceived control leads to many positive outcomes (e.g., Bhanji, Kim, & Delgado, 2016; Drewelies, Wagner, Tesch-Römer, Heckhausen, & Gerstorf, 2017; Fraizer & Caston, 2015); a lack of control brings many negative consequences (e.g., Infurna et al., 2016; Whitson & Galinsky, 2008). Based on the basic motivation processes of need intensification and satiation (Shah & Gardner, 2007), people should be especially motivated to behave in ways that can restore their thwarted feelings of control following objectification. In the present research, we proposed that people might choose to behave aggressively to restore thwarted feelings of control following objectification.

Aggression is defined as behavior that is carried out with an intention to increase one's social dominance relative to the dominance position of others, thereby raising one's reproduction success (Ferguson & Beaver, 2009; Jokela & Keltikangas-Järvinen, 2009). There are different forms or motives of aggression. For instance, people can choose aggression as a self-defense response to threats, such as defending their home or protecting resources (Buss & Shackelford, 1997; Dodge & Coie, 1987). In contrast, people can also proactively engage in aggressive action to increase their instrumental goals or hurt others (Allen, Anderson, & Bushman, 2018; Baron & Richardson, 1994; DeWall, Anderson, & Bushman, 2011; Dodge & Coie, 1987). In the current research, we focused on testing whether nonsexual objectification increases people's intention to hurt another person.

According to the frustration–aggression hypothesis, people will become frustrated when their goal attainment is blocked, and such frustration will motivate them to engage in aggressive behavior to hurt others (Berkowitz, 1989; Dollard, Miller, Doob, Mowrer, & Sears, 1939). Researchers have further theorized that frustration not only triggers retaliatory aggression (i.e., aggression against people who frustrated them), but can also lead to displaced aggression (i.e., aggression against seemingly innocent people), especially when frustrated people do not have an opportunity to aggress against the source of frustration (e.g., Breuer & Elson, 2017; Konecni & Doob, 1972; Miller, 1941). Indeed, both retaliatory and displaced aggression have been consistently evidenced in prior empirical research. When compared to people who are not frustrated, frustrated people are more likely to engage in aggressive behaviors toward the original provocateur of the frustration (e.g., Breuer, Scharkow, & Quandt, 2015; Dill & Anderson,

1995; Krahé, Lutz, & Sylla, 2018) and even displace aggression toward an innocent target who is not responsible for the initial frustrating experience (e.g., Leander & Chartrand, 2017; Marcus-Newhall, Pedersen, Carlson, & Miller, 2000; Pedersen, Gonzales, & Miller, 2000; Reijntjes, Kamphuis, Thomaes, Bushman, & Telch, 2013).

When people experience objectification, their needs and goals to master their destiny and actualize their potential are blocked. We proposed that such frustration may thwart their perceived control and that they should be motivated to behave in ways that can restore their control. Because people can symbolically assert superiority and control over other people when they behave aggressively, such a process might make aggressive people perceive having control and power. Therefore, researchers have theorized that people may use aggression to restore thwarted feelings of control (Baumeister et al., 1996; Tedeschi & Felson, 1994). According to this theory, if people perceive a lack of control following objectification, they should be motivated to behave aggressively, toward both people who objectified or offended them and innocent people who have not objectified or offended them in any way, because such an aggressive means allows them to restore thwarted perceived control.

The speculation that thwarted perceived control may motivate aggressive behavior has received some indirect support in the literature. Previous empirical studies provided evidence that people may behave aggressively in interpersonal situations where they lack sufficient control (e.g., Scott & Weems, 2010; Stets & Burke, 2005) or when they desire to gain control (Dyches & Mayeux, 2015). More generally, low perceived control can predict psychological constructs related to aggression, such as hostility and prejudice (e.g., Agroskin & Jonas, 2010; Greenaway, Louis, Hornsey, & Jones, 2014; Kraus, Horberg, Goetz, & Keltner, 2011). As elucidated in the previous section, we proposed that objectification should thwart people's perceived control because objectified people may believe that the process and outcome associated with their social interaction were completely determined by others. If objectified people have lower perceived control, such a perception may in turn motivate them to engage in aggression. Thus, thwarted perceived control should mediate the effect of objectification on aggression.

Although we predicted that objectified people should generally perceive lower levels of perceived control, it is possible that these thwarted feelings of control can be restored through situational interventions. Previous research has demonstrated that control restoration interventions can counteract many adverse effects of control deprivation, such as the perception of illusory patterns (Whitson & Galinsky, 2008), depletion of cognitive resources (Ric & Scharnitzky, 2003), and death anxiety (Agroskin & Jonas, 2013). In the present research, we proposed that the control restoration intervention could ameliorate the effect of performance-based objectification on aggression. When the thwarted perceived control of objectified people is restored, they should be less likely to engage in aggressive behavior. In contrast, when objectified people's perceived control is not restored, they should be more likely to engage in aggressive behavior because they are motivated to restore control.

1.4. Current research

In this research, we examined whether objectification (i.e., being manipulated as an instrument that aids others in achieving performance-related goals) promotes aggression through thwarted perceived control and whether restoring objectified people's thwarted control weakens the effect of objectification on aggression. Ethical approval for the experiments was obtained from the Institutional Review Board of the university. In each of the experiments, participants' feelings of objectification were first manipulated, and then their aggression was assessed. In Experiments 3 and 4, we also measured participants' perceived control to test whether thwarted control mediated the effect of objectification on aggression. In Experiments 1, 2, and 4, we explored an alternative explanation that increased aggression following objectification could be attributed to the negative valence associated with objectification. In Experiments 5 and 6, we manipulated participants' perceived control to test whether restoring objectified participants' control could weaken their aggressive tendency. In all experiments, we conducted the power analysis using G*power 3.1.9.2 (Faul, Erdfelder, Buchner, & Lang, 2009) to calculate the required sample size. In this article, we report all experimental conditions, manipulations, and measures of the experiments and explain the sample size determination criteria and data exclusions. In all experiments, we did not analyze the data before the completion of the data collection, and no additional participants were recruited after the analyses.

2. Experiment 1

In Experiment 1, we tested the hypothesis that objectification would promote aggression and explored whether potential changes in negative emotion could account for the objectification–aggression link. Prior objectification studies typically had around 30 to 40 participants in each experimental condition and reported a medium-to-large effect (e.g., Calogero, 2013; Teng, Chen, Poon, & Zhang, 2015). The power analysis revealed that 77 participants were required to detect a medium-to-large effect ($f = 0.325$) with 80% power. Therefore, we planned to recruit 35–40 participants in each of the conditions.

2.1. Method

2.1.1. Participants and design

Seventy-five undergraduates at a public university in Hong Kong participated in this experiment in exchange for HKD50 (approximately USD6.5). Participants were randomly assigned to the objectification or nonobjectification condition. One participant was excluded from the analyses due to incomplete data. The final sample consisted of 74 participants (17 men; mean age = 20.76; $SD = 1.75$).

2.1.2. Procedures and materials

Participants were told that the experiment was about online collaboration. After providing informed consent, participants were first exposed to the manipulation of objectification. Prior research showed that feelings of objectification could be induced through feedback during social interactions (e.g., Chen, Teng, & Zhang, 2013; Teng et al., 2015). We adapted this manipulation in this experiment. Specifically, participants were asked to collaborate with one of the five online players to work on tasks in a competition. In reality, the entire interaction was computer programmed. Participants were asked to write a short self-introduction to describe themselves and then read short descriptions of all ostensible online players. Next, participants were asked to select one player that they wanted to work with and to provide reasons they would like to work with him or her. All participants then received feedback that they were selected by all of the players and were given a chance to see the reasons they were chosen. By random assignment, participants in the objectification condition were told that all players wanted to work with them because they thought the participants could be easily manipulated as tools and help them to win (e.g., "[Participant's name] seems to be an easily manipulated person who can serve as a ladder to help me win the competition"). In contrast, participants in the nonobjectification condition were told that all players wanted to work with them because they thought that the participants were nice and friendly (e.g., "From the description, I think [participant's name] is a friendly and sincere person. I believe we will have fun during the tasks"). In both conditions, participants were then informed that because everyone wanted to work with them, it was impossible to form groups, and all participants needed to complete another task individually.

Participants then responded to the five manipulation check statements (i.e., "I feel objectified," "I feel like I am being treated as an

object," "People treat me as a tool," "A lot of other players choose me as their partner," and "People are willing to choose me as their partner") using a 7-point scale (1 = *strongly disagree*; 7 = *strongly agree*). The scores of the first three statements were averaged to check whether the objectification manipulation could make participants feel objectified ($\alpha = 0.98$), and the last two statements were averaged to check whether participants in both conditions would equally agree that other players wanted to work with them ($r = 0.62$, $p < .001$). Participants also completed a self-report measure to assess their negative emotion after the experimental manipulation (i.e., "I feel happy," "I feel bad," "I feel good," and "I feel sad"; 1 = *strongly disagree*; 7 = *strongly agree*). The scores were reverse scored (when necessary) and averaged to index negative emotion ($\alpha = 0.83$).

Finally, the chilled water paradigm was adopted to examine participants' aggression level (e.g., Poon & Chen, 2014; Poon & Wong, 2019; Przybylski, Deci, Rigby, & Ryan, 2014). Participants were told that the laboratory had another ongoing study in which other people needed to undergo a physiological stressor by putting their hand in a chilled water bath. Participants were further reminded that keeping one's hand in chilled water could be very painful, especially when the water temperature was low, and the period of exposure was long. Participants then selected the water temperature (from 10 °C to 0 °C) and the duration (from 0 s to 50 s), which were standardized and summed to form an aggression composite. Participants were then thanked and carefully debriefed.[1]

2.2. Results and discussion

2.2.1. Manipulation checks

Participants in the objectification condition ($M = 4.67$, $SD = 1.54$) felt more objectified than participants in the nonobjectification condition ($M = 1.89$; $SD = 1.14$), $F(1, 72) = 77.03$, $p < .001$, $\eta_p^2 = 0.52$, observed power = 1.000. Moreover, participants in both the objectification ($M = 6.32$; $SD = 0.89$) and nonobjectification conditions ($M = 6.11$; $SD = 0.97$) equally agreed that other players wanted to work with them, $F(1, 72) = 0.98$, $p = .325$, $\eta_p^2 = 0.01$, observed power = 0.165. Therefore, our objectification manipulation was effective.

2.2.2. Negative emotion

Participants in the objectification condition ($M = 3.36$; $SD = 1.25$) reported higher levels of negative emotion than participants in the nonobjectification condition ($M = 2.15$; $SD = 0.85$), $F(1, 72) = 23.53$, $p < .001$, $\eta_p^2 = 0.25$, observed power = 0.998.

2.2.3. Aggression

Participants in the objectification condition ($M = 0.37$; $SD = 1.30$) behaved more aggressively than participants in the nonobjectification condition ($M = -0.40$; $SD = 1.39$), $F(1, 72) = 6.06$, $p = .016$, $\eta_p^2 = 0.08$, observed power = 0.680.

2.2.4. Did negative emotion promote aggression?

A bootstrapping mediation analysis with 5000 iterations was conducted to test whether the effect of objectification on aggression was mediated by negative emotion using the PROCESS macro (Model 4; Hayes, 2013). The experimental condition was coded as 1 (objectification condition) or −1 (nonobjectification condition). A nonsignificant indirect effect through negative emotion was observed because the 95% confidence interval included zero (−0.26 to 0.12). Thus, there was no statistical evidence showing that negative emotion could account for the effect of objectification on aggression.

Experiment 1 provided the first experimental support for the prediction that nonsexual performance-based objectification promotes aggression. Compared with nonobjectified participants, objectified participants behaved more aggressively to hurt a stranger by assigning a colder and longer exposure to chilled water. Crucially, this experiment showed that difference in emotional valence in the experimental conditions could not account for the effect of objectification on aggression. Although Experiment 1 showed that the link between objectification and aggression could not be attributed to negative emotion, it was desirable to replicate the findings by comparing the effect of objectification on aggression with a negative nonsocial control condition. Moreover, it is noteworthy that the sample size of Experiment 1 was slightly lower than the required sample size because of the availability of research participants at the time of data collection. In the subsequent experiments, we paid special attention to the number of participants recruited and made sure that we had enough participants before stopping the data collection.

3. Experiment 2

In Experiment 2, we aimed to extend and replicate the findings of Experiment 1 in two important ways. First, we adopted a different paradigm to induce the feelings of objectification and another measure to capture participants' aggression to increase the external validity of the observed findings. Second, we included a negative control condition to compare the effect of objectification on aggression to a negative nonsocial misfortune experience. As in Experiment 1, we expected the effect of the current experiment to be medium to large. The power analysis revealed that 77 participants were required to detect a medium-to-large effect ($f = 0.325$) with 80% power. Therefore, we planned to recruit around 40 participants for each condition.

3.1. Method

3.1.1. Participants and design

Eighty-two undergraduates at a public university in Hong Kong (12 men; mean age = 20.37; $SD = 1.67$) completed this experiment for partial course credits. They were randomly assigned to the objectification or misfortune condition.

3.1.2. Procedures and materials

Participants were told that the experiment was about imagination. After providing informed consent, participants were first exposed to the experimental manipulation of performance-based objectification, which was adapted from prior research (e.g., Newheiser, LaFrance, & Dovidio, 2010; Teng et al., 2015; Tiggemann & Andrew, 2012). Specifically, participants imagined that they were first-year undergraduate students working as interns at a company. By random assignment, participants in the objectification condition imagined that they experienced objectification at their university (e.g., their classmates treated them as a tool to complete group assignments and achieve good grades) and at the company (e.g., their supervisor treated them as an object to reduce workload by giving them large amounts of work without any advice). On the contrary, participants in the misfortune condition imagined that they encountered some misfortunate experiences at the university (e.g., the Internet connection at home suddenly shut down during the course enrollment period so they were unable to select courses in which they wanted to enroll) and at the company (e.g., getting work-related injuries). Afterward, participants responded to five manipulation check

[1] In all experiments, we carefully probed participants in terms of whether they had any suspicions regarding the experimental procedures, and a few of them expressed some suspicions about whether another person would actually receive the treatment assigned by them in the critical task assessing their aggression. We decided to keep these participants in the analyses because research has found that participants' responses could still serve as valid indicators of their aggressive inclinations, even if they believe the aggression task is just hypothetical (e.g., Babcock, Costa, Green, & Eckhardt, 2004; O'Connor, Archer, & Wu, 2001). It should also be noted that removing these participants from the analyses would not substantially influence the observed results. Nevertheless, we acknowledged and discussed this limitation in the General Discussion.

statements: "I feel objectified," "I feel like I am being treated as an object," "People treat me as a tool," "The experience is very negative," and "I can clearly imagine the experience" (1 = *strongly disagree*; 7 = *strongly agree*). The scores of the first three statements were averaged to check whether the objectification manipulation could make participants feel objectified ($\alpha = 0.92$). The fourth statement checked whether participants rated the objectification and misfortunate experience as equally negative, and the fifth statement checked whether participants in the two conditions had similar clarity in imagination. Participants also completed the same measure as in Experiment 1 to assess their negative emotion after the manipulation ($\alpha = 0.84$).

Next, participants proceeded to the task that examined their current aggression level, which was adapted from prior studies (i.e., the noise blast paradigm; e.g., Giancola & Zeichner, 1995; Poon & Chen, 2016; Poon & Teng, 2017). Participants were informed about another ongoing study in the laboratory that was investigating the impacts of sound stimulation on human intellectual performance. That study required participants to complete intellectual tests after listening to blasts of aversive white noise. Participants of the current experiment were then told that these noise blasts could be extremely unpleasant and painful, especially if loud and long noise blasts were administered. They were then given the task to choose the intensity (0 to 105 dB) and duration (0 to 5 s) for a stranger involved in that study. The intensity and duration levels selected were first standardized then summed to indicate participants' aggression level. After they had completed the tasks, participants were thanked and debriefed.

3.2. Results and discussion

3.2.1. Manipulation checks

Participants in the objectification condition ($M = 4.38$, $SD = 1.49$) reported feeling more objectified than participants in the misfortune condition ($M = 2.88$; $SD = 1.32$), $F(1, 80) = 23.37$, $p < .001$, $\eta_p^2 = 0.28$, observed power = 0.998. Moreover, participants in the objectification condition ($M = 5.07$; $SD = 1.54$) and participants in the misfortune condition ($M = 4.98$; $SD = 1.41$) rated the two experiences as equally negative, $F(1, 80) = 0.09$, $p = .765$, $\eta_p^2 = 0.001$, observed power = 0.060. Likewise, participants in the objectification condition ($M = 5.24$; $SD = 1.30$) and participants in the misfortune condition ($M = 4.95$; $SD = 1.28$) had similar levels of imagination clarity, $F(1, 80) = 1.05$, $p = .308$, $\eta_p^2 = 0.01$, observed power = 0.173. Thus, the manipulation was effective.

3.2.2. Negative emotion

Participants in the objectification condition ($M = 5.02$; $SD = 1.14$) reported similar levels of negative emotion to participants in the misfortune condition ($M = 5.23$; $SD = 1.08$), $F(1, 80) = 0.71$, $p = .401$, $\eta_p^2 = 0.01$, observed power = 0.133.

3.2.3. Aggression

Participants in the objectification condition ($M = 0.44$; $SD = 1.68$) behaved more aggressively than participants in the misfortune condition ($M = -0.44$; $SD = 1.59$), $F(1, 80) = 5.89$, $p = .018$, $\eta_p^2 = 0.07$, observed power = 0.669.[2]

[2] As some research suggested that the duration measure of the noise blast paradigm may not have good validity, and it was not included in the standardized version (Ferguson, Smith, Miller-Stratton, Fritz, & Heinrich, 2008), we conducted an additional analysis to test whether a similar result would be observed if we only used the intensity measure. The observed result was similar, as participants in the objectification condition ($M = 0.22$; $SD = 1.05$) tended to assign a higher noise intensity to another person than participants in the misfortune condition did ($M = -0.22$; $SD = 0.91$), $F(1, 80) = 5.89$, $p = .050$, $\eta_p^2 = 0.05$.

3.2.4. Did negative emotion promote aggression?

A bootstrapping mediation analysis with 5000 iterations was conducted to test whether the effect of objectification on aggression was mediated by negative emotion using the PROCESS macro (Model 4; Hayes, 2013). The experimental condition was coded as 1 (objectification condition) or −1 (misfortune condition). A nonsignificant indirect effect through negative emotion was observed because the 95% confidence interval included zero (−0.04 to 0.17). Thus, there was no statistical evidence showing that negative emotion could account for the effect of objectification on aggression.

Experiment 2 provided additional experimental support for the prediction that performance-based objectification promotes aggression. Compared with participants who imagined misfortunate experiences, those who imagined objectification experiences behaved more aggressively to hurt a stranger by assigning a louder and longer exposure to aversive white noise. Consistent with Experiment 1, this experiment demonstrated that the negative valence associated with objectification could not explain why objectification promotes aggression because participants rated the objectification and misfortunate experiences as equally negative, but participants in the objectification condition behaved more aggressively than participants in the misfortune condition. Moreover, negative emotion did not mediate the effect of objectification on aggression. Although the findings of Experiments 1 and 2 were clear, they did not enable us to identify the psychological mechanism underlying the observed results. We proposed that objectification threatens people's perceived control, which in turn promotes aggression. Experiment 3 was conducted to test this mediation model.

4. Experiment 3

In Experiment 3, we extended the previous experiments by testing our proposed model that perceived control mediates the effect of objectification on aggression. Based on the results of the previous experiments, we expected the effect size of Experiment 3 to be medium. The power analysis revealed that 128 participants were required to detect a medium effect ($f = 0.25$) with 80% power. Thus, we planned to recruit around 60 to 70 participants in each condition.

4.1. Method

4.1.1. Participants and design

One hundred and thirty-one undergraduates at a public university in Hong Kong participated in this experiment in exchange for HKD50 (approximately USD6.5). They were randomly assigned to the objectification or nonobjectification condition. Two participants were excluded from the analyses due to incomplete data. The final sample consisted of 129 participants (19 men; mean age = 20.50; $SD = 1.72$).

4.1.2. Procedures and materials

As in Experiment 1, participants were told that the experiment was about online collaboration. By random assignment, participants were either objectified or not during the interaction. Participants then completed the same manipulation check measure as in Experiment 1 to check whether the objectification manipulation could make participants feel objectified ($\alpha = 0.96$) and whether participants in both conditions would equally agree that other players wanted to work with them ($r = 0.75$, $p < .001$).

Next, participants completed a self-report measure that assessed their perceived control following an interpersonal experience (e.g., Chen, Poon, & DeWall, 2015). Participants indicated the extent to which they agreed with the five statements (e.g., "I feel I have the ability to significantly alter events" and "I feel like other people decide everything"; 1 = *strongly disagree*; 7 = *strongly agree*). Their responses were reversed (when necessary) and averaged to index perceived control ($\alpha = 0.76$).

Finally, participants' aggression was assessed using the voodoo doll

task (VDT; e.g., Bushman, DeWall, Pond Jr., & Hanus, 2014; Chester & DeWall, 2017; DeWall et al., 2013; McCarthy, Coley, Wagner, Zengel, & Basham, 2016). In a typical VDT, participants are asked to transfer the characteristics of a person onto a doll that represents a target person, and they are provided with an opportunity to harm the doll by inserting pins into it. This task is able to capture symbolic aggression and elicit psychological responses similar to inflicting harm on an actual person because there is a tendency for humans to confer certain objects with magical powers (King, Burton, Hicks, & Drigotas, 2007; Rozin, Millman, & Nemeroff, 1986), and people would perceive that inserting pins to the doll will lead to some bad consequences for the target person (DeWall et al., 2013). The use of VDT in assessing people's aggression has received some empirical support. In particular, previous studies have found that participants' responses in the VDT task are associated with various self-report and behavioral indicators of aggression, and their responses are stable and consistent across different time points (e.g., DeWall et al., 2013; McCarthy et al., 2016). Thus, the task has received some evidence of its reliability, convergent validity, and construct validity, and it can be used to assess people's aggressive inclinations.

In this experiment, participants were asked to imagine that the voodoo doll represented any player of the previous online social interaction. Participants were then shown a series of pictures of voodoo dolls with 0 to 19 pins in them. After that, they were given the opportunity to vent any unhappiness or negative energy they might have by sticking pins into the doll. Participants were given the choice to insert 0 to 51 pins and were asked to decide on the number of pins they wanted to insert into the doll. The number of pins stabbed served as an act and measure of aggression. Participants were thanked and received a debriefing after completing the task.

4.2. Results and discussion

4.2.1. Manipulation checks

As expected, participants in the objectification condition (M = 4.83, SD = 1.58) reported feeling more objectified than participants in the nonobjectification condition (M = 1.83; SD = 1.23), $F(1, 127) = 144.35$, $p < .001$, $\eta_p^2 = 0.53$, observed power = 1.000. Moreover, participants in both the objectification (M = 6.23; SD = 1.05) and nonobjectification conditions (M = 6.12; SD = 1.07) equally agreed that other players wanted to work with them in the social interaction, $F(1, 127) = 0.37$, $p = .545$, $\eta_p^2 = 0.003$, observed power = 0.092. Therefore, our manipulation was effective.

4.2.2. Perceived control

Participants in the objectification condition (M = 3.79, SD = 1.18) reported lower levels of perceived control than participants in the nonobjectification condition (M = 4.69; SD = 0.99), $F(1, 127) = 21.84$, $p < .001$, $\eta_p^2 = 0.15$, observed power = 0.996.

4.2.3. Aggression

Participants in the objectification condition (M = 8.11, SD = 11.87) behaved more aggressively than participants in the nonobjectification condition (M = 3.50; SD = 9.97) by inserting more pins into the doll, $F(1, 127) = 5.69$, $p = .019$, $\eta_p^2 = 0.04$, observed power = 0.658. Similar to previous studies using the same paradigm (e.g., Bushman et al., 2014; DeWall et al., 2013), a portion of participants did not insert any pins into the doll. We tested whether the distribution of the number of pins was normally distributed. The results revealed that the distribution did not meet the assumption of normality because it was zero-inflated and positively skewed (skewness = 2.881, standard error of skewness = 0.213, $Z = 13.53$, $p < .001$). As recommended by DeWall et al. (2013), a Poisson loglinear distribution was also adopted using generalized linear models. The Poisson regression analysis revealed that objectification significantly predicted aggression (B = 0.84, SE = 0.08, $\chi^2 = 110.93$, $p < .001$), such that participants in the objectification condition inserted more pins into the doll than participants in the nonobjectification condition.

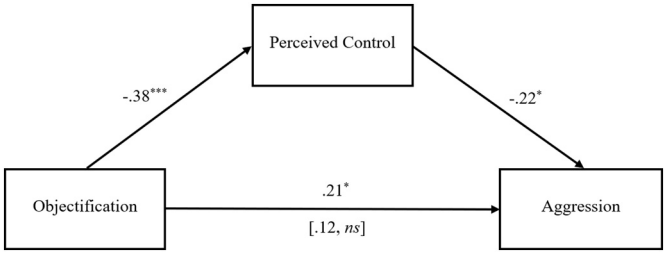

Fig. 1. The effect of objectification on aggression was mediated by perceived control (Experiment 3). Coefficients are standardized.
*$p < .05$, **$p < .01$, ***$p \leq .001$.

4.2.4. Did perceived control promote aggression?

A bootstrapping mediation analysis with 5000 iterations was conducted to test whether the effect of objectification on aggression was mediated by perceived control. The experimental condition was coded as 1 (objectification) or −1 (nonobjectification). A significant indirect effect through perceived control was observed because the 95% confidence interval did not include zero (0.16 to 2.16; see Fig. 1). These findings provided direct empirical evidence supporting the prediction that thwarted control mediates the effect of objectification on aggression.

Experiment 3 provided the first empirical findings for our proposed model that objectification threatens perceived control, which mediates the effect of objectification on aggression. Compared with nonobjectified participants, those who were objectified reported lower perceived control and higher aggressive tendency. Importantly, this experiment showed that perceived control could account for the effect of objectification on aggression.

Taken together, Experiments 1 to 3 provided converging evidence that objectification promotes aggressive inclination toward both the source of objectification and innocent people who have not objectified them previously. However, it should be noted that participants in these studies are undergraduate students in Hong Kong. We did not have any compelling reasons why culture may influence the observed effect, but it may be fruitful to replicate the findings using a Western community sample to increase the external validity of the findings. Moreover, Experiment 3 showed that perceived control mediated the effect of objectification on aggression, but this experiment did not consider the potential role of negative emotion in influencing the mediation result. Despite Experiments 1 and 2 demonstrated that negative emotion could not account for the objectification-aggression link, it was desirable to examine whether perceived control could still mediate the effect of objectification on aggression after controlling for negative emotion.

5. Experiment 4

In Experiment 4, we extended the previous experiment in two major ways. First, we tested whether objectification promotes aggressive responses by adopting a Western community sample. Second, we tested whether perceived control could still mediate the effect of objectification on aggression after controlling for negative emotion. As in Experiment 3, we expected the effect of the present study to be medium. The power analysis revealed that 128 participants were required to detect a medium effect (f = 0.25) with 80% power. Thus, we planned to recruit around 60 to 70 participants in each condition.

5.1. Method

5.1.1. Participants and design

Participants were recruited from Amazon's Mechanical Turk (Buhrmester, Kwang, & Gosling, 2011; Paolacci, Chandler, & Ipeirotis,

2010). One hundred and forty-three participants in the United States completed this experiment for USD0.5, and they were randomly assigned to either the objectification or nonobjectification condition. Four participants in the objectification condition failed to recall the required experience and therefore were removed from all analyses reported below. Keeping these participants in the analyses would not substantially alter the findings. Our final sample consisted of 139 participants (44 men; mean age = 38.69; *SD* = 14.41).

5.1.2. Procedures and materials

Participants were told that the experiment was about memory. After providing informed consent, participants were first exposed to the manipulation of objectification through recalling an experience, which was adapted from prior research (e.g., Calogero, 2013; Chen et al., 2013). By random assignment, participants in the objectification condition recalled a past incidence of performance-based objectification. In contrast, participants in the nonobjectification condition recalled their last visit to a supermarket or grocery store. Afterward, participants responded to the four manipulation check statements: "I feel objectified," "I feel like I am being treated as an object," "People treat me as a tool," and "I can clearly recall the experience" (1 = *strongly disagree*; 7 = *strongly agree*). The scores of the first three statements were averaged to check whether the objectification manipulation could make participants feel objectified (α = 0.86). The fourth statement checked whether participants in the two conditions could recall the experience with equal clarity.

Next, participants completed a self-report measure to assess their current perceived control, which was adopted from previous research (e.g., Chou, Parmar, & Galinsky, 2016; Lachman & Weaver, 1998). Participants responded to five statements (e.g., "I can just do anything I really set my mind to" and "Other people determine most what I can and cannot do"; 1 = *strongly disagree*; 7 = *strongly agree*). The scores were reversed (when necessary) and averaged to form a composite of perceived control (α = 0.81). Participants also completed the same self-report measure of negative emotions as in Experiments 1 and 2 (α = 0.91).

Finally, participants' aggression upon some provocations was assessed using a measure adapted from prior research (e.g., Chen, DeWall, Poon, & Chen, 2012; O'Connor et al., 2001). In detail, participants received the instruction to imagine that they were the main characters in eight scenarios that provoke aggression and were asked to report how likely they would be to engage in certain aggressive behaviors in those scenarios. For example, in one scenario, participants were asked to imagine that they were looking for a parking space in the center of town on a Saturday afternoon. They drove into a car park and just as they were about to reverse into one of the few remaining spaces, another car sped into the space. Participants were then asked to indicate how likely they would be to scratch the person's car unnoticed after the person left (1 = *very unlikely*; 7 = *very likely*). Participants' various aggressive responses toward different provocations (e.g., spanking their children who have been annoying them after a long workday, dirtying the windows a cleaner has just cleaned after the cleaner accidentally spills soapy hot water on their newly cleaned suit) were averaged to index aggression, with higher scores indicating higher levels of aggression (α = 0.76). Participants then received a debriefing.

5.2. Results and discussion

5.2.1. Manipulation checks

Participants in the objectification condition (*M* = 4.77, *SD* = 1.43) reported feeling more objectified than participants in the nonobjectification condition (*M* = 1.99; *SD* = 1.13), *F*(1, 137) = 163.45, $p < .001$, $\eta_p^2 = 0.54$, observed power = 1.000. Moreover, participants in the objectification condition (*M* = 6.39; *SD* = 0.97) and participants in the nonobjectification condition (*M* = 6.14; *SD* = 1.17) had similar clarity in recalling the experience, *F*(1, 137) = 1.96, $p = .164$, $\eta_p^2 = 0.01$, observed power = 0.284. Therefore, our experimental manipulation was effective.

5.2.2. Perceived control

Participants in the objectification condition (*M* = 4.54, *SD* = 1.31) reported lower levels of perceived control than participants in the nonobjectification condition (*M* = 5.20; *SD* = 1.18), *F*(1, 137) = 9.74, $p = .002$, $\eta_p^2 = 0.07$, observed power = 0.873.

5.2.3. Negative emotion

Participants in the objectification condition (*M* = 4.66, *SD* = 1.67) reported higher levels of negative emotion than participants in the nonobjectification condition (*M* = 2.75; *SD* = 1.28), *F*(1, 137) = 58.65, $p < .001$, $\eta_p^2 = 0.30$, observed power = 1.000.

5.2.4. Aggression

Participants in the objectification condition (*M* = 2.78, *SD* = 1.22) reported higher levels of aggression than participants in the nonobjectification condition (*M* = 2.29; *SD* = 0.86), *F*(1, 137) = 7.61, $p = .007$, $\eta_p^2 = 0.05$, observed power = 0.782.

5.2.5. Did negative emotion promote aggression?

A bootstrapping mediation analysis with 5000 iterations was conducted to test whether the effect of objectification on aggression was mediated by negative emotion using the PROCESS macro (Model 4; Hayes, 2013). The experimental condition was coded as 1 (objectification condition) or −1 (nonobjectification condition). A nonsignificant indirect effect through negative emotion was observed because the 95% confidence interval included zero (−0.15 to 0.14). Thus, there was no statistical evidence showing that negative emotion could account for the effect of objectification on aggression.

5.2.6. Did perceived control promote aggression?

Another bootstrapping mediation analysis with 5000 iterations was conducted to test whether the effect of objectification on aggression was mediated by perceived control using the PROCESS macro (Model 4; Hayes, 2013). A significant indirect effect through perceived control was observed because the 95% confidence interval did not include zero (0.02 to 0.17; see Fig. 2). These findings provided additional evidence for our model that perceived control could account for the effect of objectification on aggression. In addition, the 95% confidence interval via perceived control still excluded zero (0.03 to 0.21) when negative emotion was simultaneously included in the mediation model.

Experiment 4 provided additional empirical evidence that thwarted control mediates the effect of objectification on aggression. Compared with participants who recalled a neutral experience, those who recalled an objectification experience had a higher intention to engage in various forms of aggressive behavior, such as scratching another person's car or spanking their children who have been annoying them. Importantly, this experiment demonstrated that perceived control could account for the effect of objectification on aggression even after controlling for negative emotion.

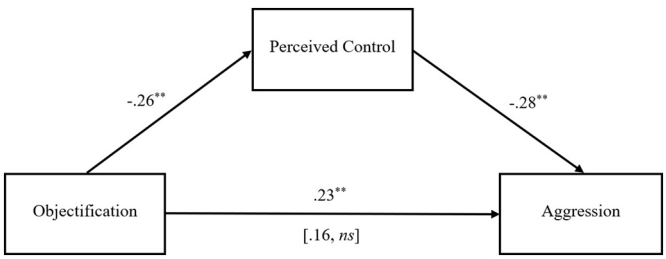

Fig. 2. The effect of objectification on aggression was mediated by perceived control (Experiment 4). Coefficients are standardized.
*$p < .05$, **$p < .01$, ***$p \leq .001$.

Experiments 3 and 4 repeatedly showed that objectification thwarts people's perceived control, which subsequently increases their level of aggression. In these studies, after the objectification manipulation, participants' perceived control was first measured by a self-report measure, and their level of aggression was then assessed by a subsequent behavioral task. Taken together, these studies provide causal evidence showing that thwarted perceived control following objectification would directly increase objectified people's level of aggression because one's current objective behavior should not influence earlier self-reported subjective feelings. Having demonstrated that perceived control plays a crucial role in the effect of objectification on aggression, it was desirable to test whether restoring objectified people's perceived control could effectively weaken their aggression.

6. Experiment 5

In Experiment 5, we extended the previous studies' findings on the mediating role of perceived control by adopting an experimental moderation approach (see also Spencer, Zanna, & Fong, 2005 for the advantages of adopting an experimental moderation design to test a mediational hypothesis). We expected the effect size of the proposed interaction to be small to medium. The power analysis revealed that 259 participants were required to detect a small to medium effect (f = 0.175) with 80% power. Therefore, we planned to recruit around 60 to 70 participants in each condition.

6.1. Method

6.1.1. Participants and design

Two hundred and eighty-nine participants completed this experiment in exchange for USD0.5. They were recruited from Amazon's Mechanical Turk (Buhrmester et al., 2011; Paolacci et al., 2010). Participants were randomly assigned to one condition in a 2 (objectification vs. nonobjectification) by 2 (control restoration vs. no restoration) between-subject design. Twelve participants failed to recall the required experience and were therefore removed from all analyses reported below. Keeping these participants in the analyses would not substantially alter the findings. The final sample consisted of 277 participants (91 men; mean age = 38.29; SD = 13.41).

6.1.2. Procedures and materials

After providing informed consent, participants were first exposed to the manipulation of objectification through imagining an experience, similar to Experiment 2. Briefly, participants imagined that they were a newcomer in a company. By random assignment, participants in the objectification condition imagined that they were objectified in the company, whereas participants in the nonobjectification condition imagined that they were generally respected in the company. Afterward, participants responded to the same manipulation check statements as in Experiment 2 to check whether the objectification manipulation could make participants feel objectified (α = 0.94) and whether participants in the two conditions could imagine the experience with equal clarity.

Next, participants were exposed to the control restoration manipulation, which was adopted in previous research (e.g., Peluso, Bonezzi, De Angelis, & Rucker, 2017; Whitson & Galinsky, 2008; Zhou, He, Yang, Lao, & Baumeister, 2012). Specifically, participants in the control restoration condition were asked to write about a significant experience in which they had complete control over the situation. In contrast, participants in the no-restoration condition wrote about a significant experience in which they did not have any control over the situation. Participants in both conditions were asked to describe the experience in detail and responded to four manipulation check statements: "I feel I have a sense of control," "I feel everything is out of my control," "I feel I have the ability to change things," and "I can clearly recall the experience" (1 = *strongly disagree*; 7 = *strongly agree*). The scores of the first three statements were reversed (when necessary) and averaged to check whether the control restoration manipulation could make participants perceive more control (α = 0.86). The fourth statement checked whether participants in the two conditions could recall the experience with equal clarity.

Finally, the noise blast paradigm, as in Experiment 2, was used to measure participants' aggression. Briefly, the participants chose the duration and intensity of aversive white noise a stranger would be exposed to. Both duration and intensity levels were standardized and added up to form a score to indicate aggression. At the end, participants were fully thanked and debriefed.

6.2. Results and discussion

6.2.1. Manipulation checks

As expected, participants in the objectification condition (M = 5.75, SD = 1.29) reported feeling more objectified than participants in the nonobjectification condition (M = 1.80; SD = 1.28), $F(1, 275) = 659.22$, $p < .001$, $\eta_p^2 = 0.71$, observed power = 1.000. Moreover, participants in the objectification condition (M = 6.32; SD = 1.07) and participants in the nonobjectification condition (M = 6.09; SD = 1.16) had similar clarity in imagining the experience, $F(1, 275) = 2.95$, $p = .087$, $\eta_p^2 = 0.01$, observed power = 0.402. Therefore, our objectification manipulation was effective in inducing feelings of objectification.

In addition, participants in the control restoration condition (M = 5.53, SD = 1.16) reported having higher levels of perceived control than participants in the no-restoration condition (M = 3.74; SD = 1.66), $F(1, 275) = 107.72$, $p < .001$, $\eta_p^2 = 0.28$, observed power = 1.000. Moreover, participants in the control restoration condition (M = 6.30; SD = 1.26) and participants in the no-restoration condition (M = 6.41; SD = 1.08) had similar clarity in recalling the experience, $F(1, 275) = 0.59$, $p = .444$, $\eta_p^2 = 0.002$, observed power = 0.132.

6.2.2. Aggression

We predicted that the control restoration manipulation would weaken the effect of objectification on aggression. A 2 by 2 analysis of variance (ANOVA) was conducted to test this prediction. The main effect of objectification was statistically significant, such that participants in the objectification condition (M = 0.27; SD = 1.87) behaved more aggressively than participants in the nonobjectification condition (M = −0.26; SD = 1.64), $F(1, 273) = 6.11$, $p = .014$, $\eta_p^2 = 0.02$, observed power = 0.693. The main effect of the control restoration manipulation was not statistically significant, $F(1, 273) = 3.65$, $p = .057$, $\eta_p^2 = 0.01$, observed power = 0.477. Importantly, these findings were qualified by the predicted interaction effect, $F(1, 273) = 13.54$, $p < .001$, $\eta_p^2 = 0.05$, observed power = 0.956 (see Fig. 3).

Simple effects analyses were conducted to clarify the observed interaction effect.[3,4] Among participants in the objectification condition,

[3] In Experiments 5 and 6, we planned to conduct four simple effects tests. To address the potential problems of multiple comparisons, the alpha (or significance) level, adjusted through Bonferroni's procedure, would be set at 0.0125 (i.e., 0.05/4), such that the simple effects would only be considered statistically significant if the p value was < 0.0125.

[4] Similar to Experiment 2, in Experiment 5, we also conducted additional analyses to test whether similar results would be observed if we only used the intensity measure of the noise blast paradigm. The main effects of objectification and control restoration manipulation were not statistically significant, $Fs(1, 273) \leq 2.87$, $ps \geq 0.091$, $\eta_p^2 \leq 0.01$, Importantly, these findings were qualified by the predicted interaction effect, $F(1, 273) = 8.38$, $p = .004$, $\eta_p^2 = 0.03$. Simple effects analyses were conducted to clarify the observed interaction effect. Among participants in the objectification condition, participants in the control restoration condition (M = −0.20, SD = 0.97) behaved less

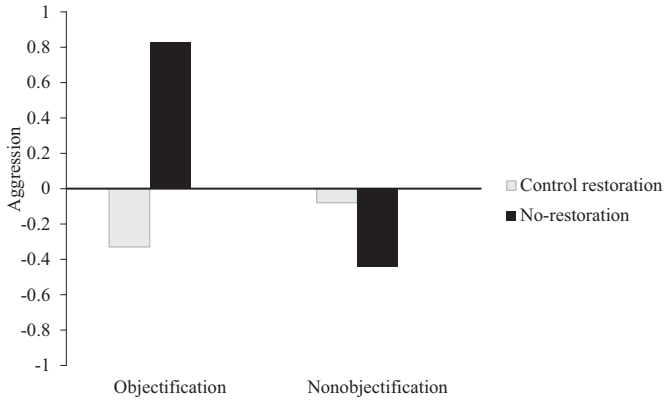

Fig. 3. Aggression as a function of objectification condition and control restoration condition (Experiment 5).

participants in the control restoration condition ($M = -0.33$, $SD = 1.84$) behaved less aggressively than participants in the no-restoration condition ($M = 0.83$, $SD = 1.74$), $F(1, 273) = 15.34$, $p < .001$. In contrast, among participants in the nonobjectification condition, participants in the control restoration condition ($M = -0.08$, $SD = 1.67$) and participants in the no-restoration condition demonstrated similar levels of aggressive behavior ($M = -0.44$, $SD = 1.61$), $F(1, 273) = 1.60$, $p = .207$.

Further analyses found that in the control restoration condition, the levels of aggression did not differ among participants in the objectification and nonobjectification conditions, $F(1, 273) = 0.72$, $p = .397$. In contrast, among participants in the no-restoration condition, objectified participants behaved more aggressively than nonobjectified participants, $F(1, 273) = 19.15$, $p < .001$.

Experiment 5 provided direct evidence for the prediction that the control restoration manipulation would interact with the objectification manipulation in influencing aggression. When objectified people's perceived control was not restored, we observed results that mimicked the results from our previous studies in which objectified people behaved more aggressively than nonobjectified people did. In contrast, when objectified people's perceived control was restored, they would no longer behave more aggressively than nonobjectified people.

7. Experiment 6

Utilizing a larger sample, in Experiment 6, we extended and replicated the findings of Experiment 5 by adopting a different paradigm to experimentally induce feelings of objectification and using a different measure to capture participants' aggression. This multi-method approach might increase the external validity of the observed findings. As in Experiment 5, we expected the effect size of the proposed interaction effect to be small to medium. The power analysis revealed that 346 participants were required to detect a small to medium effect ($f = 0.175$) with 90% power. Therefore, we planned to recruit 90–100 participants in each of the experimental conditions.

7.1. Method

7.1.1. Participants and design

Three hundred and ninety-seven participants in the United States completed this experiment in exchange for USD0.5. They were recruited from Amazon's Mechanical Turk (Buhrmester et al., 2011; Paolacci et al., 2010). Participants were randomly assigned to one condition in a 2 (objectification vs. nonobjectification) by 2 (control restoration vs. no restoration) between-subject design. Twenty-eight participants failed to recall the required experience. Keeping these participants in the analyses would not substantially alter the findings. Our final sample consisted of 369 participants (135 men; mean age = 36.10; $SD = 12.00$).

7.1.2. Procedures and materials

Participants were told that the experiment was about online collaboration. After providing informed consent, participants were first exposed to the manipulation of objectification. As in Experiments 1 and 3, participants were first led to believe that they were engaging in an online collaboration task with five people. By random assignment, participants were either objectified or not. Participants then responded to the same manipulation check statements as in Experiments 1 and 3 (i.e., "I feel objectified," "I feel like I am being treated as an object," "People treat me as a tool," "A lot of other players choose me as their partner," and "People are willing to choose me as their partner"; 1 = *strongly disagree*; 7 = *strongly agree*). The scores of the first three statements were averaged to check whether the objectification manipulation could make participants feel objectified ($\alpha = 0.95$), and the scores of the last two statements were averaged to check whether participants in both conditions would equally agree that other players wanted to work with them ($r = 0.59$, $p < .001$).

Afterward, participants completed the same control restoration manipulation as in Experiment 5. Briefly, participants in the control restoration condition recalled an experience in which they had complete control over the situation. In contrast, participants in the no-restoration condition recalled an experience in which they did not have any control over the situation. Participants then completed the same manipulation check measure as in Experiment 5 to check whether the control restoration manipulation made participants perceive more control and whether participants in the two conditions recalled the experience with equal clarity.

Finally, participants' aggression was measured using the hot sauce paradigm (e.g., Lieberman, Solomon, Greenberg, & McGregor, 1999; Poon, Teng, Wong, & Chen, 2016). Specifically, participants were told that they were working on a food tasting task for a newly developed spicy hot sauce. Participants were told that they needed to allocate a sample of extremely spicy hot sauce to another unknown person who strongly despised spicy food, and "the person" needed to consume the entire sample prepared by them. Participants were told that consuming large amounts of spicy hot sauce could be painful and uncomfortable, especially for those who hated spicy food. They were then asked to assign the spiciness level (level 1 = *not spicy at all*; level 10 = *extremely spicy*) and amount of hot sauce (level 1 = *0.0 g*; level 10 = *25 g*) that another person needed to consume. The spiciness and amount were standardized and summed to index aggression. Finally, participants received a debriefing.

7.2. Results and discussion

7.2.1. Manipulation checks

Participants in the objectification condition ($M = 5.13$, $SD = 1.74$) reported feeling more objectified than participants in the nonobjectification condition ($M = 1.77$; $SD = 1.22$), $F(1, 367) = 458.65$, $p < .001$, $\eta_p^2 = 0.56$, observed power = 1.000. Moreover, participants in both the objectification ($M = 6.61$; $SD = 0.84$) and nonobjectification conditions ($M = 6.65$; $SD = 0.79$) agreed that other

(*footnote continued*)
aggressively than participants in the no-restoration condition ($M = 0.34$, $SD = 0.98$), $F(1, 273) = 10.34$, $p = .001$. In contrast, among participants in the nonobjectification condition, participants in the control restoration condition ($M = -0.01$, $SD = 1.03$) and participants in the no-restoration condition demonstrated similar levels of aggressive behavior ($M = -0.15$, $SD = 0.95$), $F(1, 273) = 0.97$, $p = .392$. Further analyses found that in the control restoration condition, the levels of aggression did not differ among participants in the objectification and nonobjectification conditions, $F(1, 273) = 1.34$, $p = .247$. In contrast, among participants in the no-restoration condition, objectified participants behaved more aggressively than nonobjectified participants, $F(1, 273) = 8.66$, $p = .003$.

players wanted to include them in the social interaction, $F(1, 367) = 0.26$, $p = .613$, $\eta_p^2 = 0.001$, observed power = 0.080.

In addition, participants in the control restoration condition ($M = 5.59$, $SD = 1.02$) reported having higher levels of perceived control than participants in the no-restoration condition ($M = 4.31$; $SD = 1.56$), $F(1, 367) = 86.63$, $p < .001$, $\eta_p^2 = 0.19$, observed power = 1.000. Moreover, participants in the control restoration condition ($M = 6.08$; $SD = 1.16$) and participants in the no-restoration condition ($M = 6.09$; $SD = 1.47$) had similar clarity in recalling the experience, $F(1, 367) = 0.01$, $p = .924$, $\eta_p^2 = 0.000$, observed power = 0.051. Therefore, our experimental manipulations were effective.

7.2.2. Aggression

We predicted that the control restoration manipulation would weaken the effect of objectification on aggression. A 2 by 2 ANOVA was conducted to test this prediction. The main effect of objectification was not statistically significant, $F(1, 365) = 3.83$, $p = .051$, $\eta_p^2 = 0.01$, observed power = 0.496. The main effect of the control restoration manipulation was not statistically significant, $F(1, 365) = 3.03$, $p = .083$, $\eta_p^2 = 0.01$, observed power = 0.411. More importantly, these findings were qualified by the predicted interaction effect, $F(1, 365) = 7.86$, $p = .005$, $\eta_p^2 = 0.02$, observed power = 0.798 (see Fig. 4).

Among participants in the objectification condition, participants in the control restoration condition ($M = -0.22$, $SD = 1.53$) behaved less aggressively than participants in the no-restoration condition ($M = 0.56$, $SD = 1.89$), $F(1, 365) = 10.53$, $p = .001$. In contrast, among participants in the nonobjectification condition, participants in both the control restoration condition ($M = -0.08$, $SD = 1.73$) and no-restoration condition ($M = -0.26$, $SD = 1.45$) demonstrated similar levels of aggressive behavior, $F(1, 365) = 0.55$, $p = .458$.

Further analyses found that in the control restoration condition, the aggression levels did not differ among participants in the objectification and nonobjectification conditions, $F(1, 365) = 0.35$, $p = .554$. In contrast, among participants in the no-restoration condition, objectified participants behaved more aggressively than nonobjectified participants, $F(1, 365) = 11.55$, $p < .001$.

Experiment 6 provided additional evidence for the prediction that the control restoration manipulation would interact with the objectification manipulation in influencing aggression. When objectified people's perceived control was restored, they would no longer behave more aggressively than nonobjectified people. In contrast, objectified people behaved more aggressively than nonobjectified people when their perceived control was not restored.

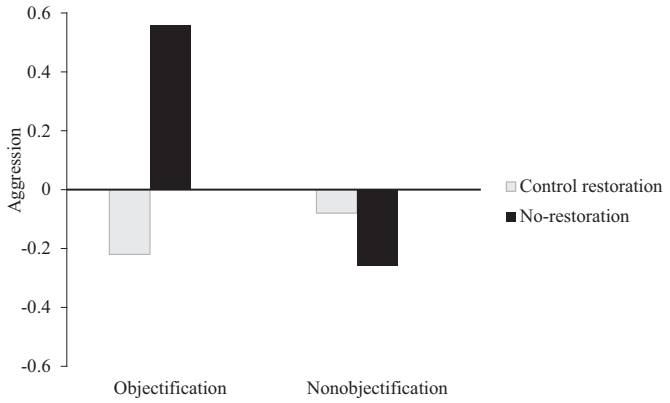

Fig. 4. Aggression as a function of objectification condition and control restoration condition (Experiment 6).

Table 1
Summary of the main hypotheses tested in the current experiments.

Experiment	*F*	*Valid N*	*p*	ΔR^2
Hypothesis: objectification ➔ aggression (main effect)				
1	6.06	74	0.016	0.08
2	5.89	82	0.018	0.07
3	5.69	129	0.019	0.04
4	7.61	139	0.007	0.05
Experiment	***Effect***	***SE***	**95% CI**	$\Delta\Delta R^2$
Hypothesis: objectification ➔ thwarted control ➔ aggression (indirect effect)				
3	0.94	0.49	[0.16, 2.16]	0.03
4	0.08	0.04	[0.02 to 0.17]	0.03
Experiment	***F***	***Valid N***	***p***	ΔR^2
Hypothesis: objectification × control ➔ aggression (interaction effect)				
5	13.54	276	< 0.001	0.05
6	7.86	369	0.005	0.02

8. General discussion

Performance-based objectification is a process of subjugation. When people are objectified, they are denigrated into instruments or tools whose existence is to merely assist others to achieve their ends, and their feelings, needs, and opportunities are denied (Gruenfeld et al., 2008; Volpato et al., 2017). Thus, objectification can strip away people's perceived control. Because people desire to determine their destiny and achieve their fullest potential (Deci & Ryan, 2000; Ryan & Deci, 2000), they should be motivated to perform behaviors that can restore their thwarted control following objectification. We put forth that objectification would increase aggression because aggressive behavior holds the symbolic significance of control and superiority over others. Thus, thwarted perceived control following objectification should explicate the effect of objectification on aggression. Restoring objectified people's thwarted control should reduce their aggression level. Table 1 summarizes the results of the main hypotheses examined in the six experiments.

Six experiments with different methodological designs provided consistent support for these predictions. The primary goal of the current research was to show that objectification in performance-related settings promotes aggression. The results of the six experiments revealed that compared with their nonobjectified counterparts, objectified participants had higher levels of aggression, such as reporting higher aggressive intentions in hypothetical scenarios, inserting more pins into a doll, and assigning more painful and harmful treatments to another person. It is noteworthy that objectified people showed higher levels of aggression toward the perpetrators of objectification or provocateurs (Experiments 3 and 4) or innocent strangers, who did not objectify or offend them in any conceivable way (Experiments 1, 2, 5, and 6). These findings suggest that objectified people would become broadly aggressive and ready to aggress against people regardless of whether the targets of aggression objectified or provoked them in previous social interactions.

In addition, in the current research, we identified a psychological mechanism underlying the objectification–aggression link. In Experiments 3 and 4, we found that objectification thwarted perceived control, which mediated the effect of objectification on aggression. Moreover, there was no statistical evidence that negative emotion could explain the observed effect (Experiments 1, 2, and 4). Perceived control still uniquely mediated the effect of objectification on aggression, even after controlling for the effect of negative emotion (Experiment 4). Taken together, these findings suggest that objectification promotes aggression because it thwarts perceived control, but not because it increases negative emotions. These findings are in line with studies showing that negative emotions alone are insufficient to predict aggression (e.g., Wyckoff, 2016). They also imply that performance-based

objectification is experienced and perceived differently when compared to negative experiences and that it holds implications far beyond general sadness in daily life.

An effective way to diminish the aggression level of objectified people was also identified. As found in Experiments 3 and 4, objectification promoted aggression because it thwarted perceived control. Therefore, we proposed that objectified people's aggression should be reduced if their thwarted control is restored through situational interventions. Consistent with our prediction, Experiments 5 and 6 demonstrated that restoring objectified people's thwarted control effectively weakened the effect of objectification on aggression. In contrast, the control restoration manipulation did not produce a statistically reliable influence on the aggression level of nonobjectified people.

8.1. Implications of the current research

In our experiments, we systematically tested the impacts of nonsexual objectification on aggression, which enriched our knowledge both theoretically and practically across various disciplines of psychology. Theoretically, our experiments established a causal effect of performance-based objectification on aggression and the corresponding psychological mechanism. A number of past studies on objectification exclusively focused on testing how sexual objectification (i.e., women are denigrated into mere instruments to satisfy men's sexual desires) influences women's well-being, emotions, cognitions, and behaviors (e.g., Chen et al., 2013; Garcia et al., 2016; Loughnan et al., 2017; Saguy, Quinn, Dovidio, & Pratto, 2010; Teng et al., 2015). However, the impacts of objectification in nonsexual domains have been scarcely examined. Our research advances existing knowledge by showing that nonsexual performance-based objectification can also negatively affect individuals and cause individuals to lash out toward others.

Certainly, sexual objectification is different from nonsexual forms of objectification. In sexual objectification, people (usually women) are treated as mere sex tools to satisfy others' sexual desires, and they are often perceived as incompetent (e.g., Heflick, Goldenberg, Cooper, & Puvia, 2011; Loughnan et al., 2017). However, in the nonsexual form of objectification examined in the current research, objectified people could be perceived as competent and hence used as tools to help others attain performance goals. Thus, the current findings go beyond past findings that objectification can hurt people even though objectified people can be very competent to be used as tools in many domains and settings. They may also urge parents, teachers, practitioners, and researchers not to overlook the detrimental impacts of nonsexual forms of objectification that are commonly experienced in daily social interactions in various domains across the life span.

Another significant contribution of the current research is that it draws attention to the fact that not all instances of social inclusion and acceptance impact individuals positively. In Experiments 1, 3, and 6, participants in both the objectification and nonobjectification conditions were accepted by others, but only participants who were objectified displayed increased aggressive behavior. In these studies, even though participants in the objectification condition were in fact the most desired partners in their respective groups, the reasons for the acceptance affected the way the participants reacted. Although humans have a fundamental need to be accepted (Baumeister & Leary, 1995), the current findings imply that some inclusion experiences can also be harmful and lead to undesirable outcomes. They also highlight the need to take into consideration the reasons or conditions for acceptance and inclusion to fully understand the impacts and processes of different forms of interpersonal interactions.

On an applied level, the current studies identified a novel intervention strategy by restoring control to combat the negative impact of objectification on aggression. Experiments 5 and 6 showed that a brief control restoration intervention could mitigate the effect of objectification on aggression. A better understanding of how objectification promotes aggression and how to weaken such an effect can aid in the development of theory-driven intervention strategies aimed at helping people better cope with objectification and related forms of interpersonal maltreatment. Taking the current observed findings into consideration, if objectified people are assisted to regain control through situational interventions, their aggression level could be reduced. Such a reduced aggression level could facilitate harmony and reduce conflicts in subsequent social interactions, which could enhance the well-being of objectified people.

8.2. Limitations and future research directions

The six experiments reported in the current article provided converging and consistent empirical evidence that objectification thwarts perceived control, which in turn promotes aggressive responses. They also demonstrated that control restoration effectively weakens the effect of objectification on aggression. Despite the promising results found in the current research, there were a few limitations worth noting that should be considered when interpreting the findings. These limitations can also serve as avenues for future research.

First, the experience of objectification was illustrated as an all-or-none experience in all of the experiments. However, objectification should be more accurately described as a spectrum, where people can be objectified to different degrees in real life (Haslam & Loughnan, 2014). For example, individuals can be mildly objectified by merely having their needs overlooked by others or blatantly objectified by being labelled as a tool and manipulated by others to achieve goals. In a related vein, people can be objectified for different motives (e.g., role-prescribed, oblivious, or punitive motives). The settings of the current studies did not allow us to investigate how different degrees or forms of objectification may potentially influence the effect of objectification. To fully capture the experience of objectification, researchers can consider comparing how different degrees and forms of objectification would influence the effect of objectification on aggression in future studies.

Second, the current experiments provided converging evidence that thwarted perceived control mediated the effect of objectification on aggression. However, other psychological mechanisms may also mediate the objectification–aggression link. For example, objectified people may have higher feelings of insult and anger and lower levels of self-esteem, thereby increasing their aggressive inclinations. In future studies, researchers may investigate whether these psychological processes can account for the effect of objectification on aggression.

Third, regarding to the methodology of the current research, the aggression paradigms adopted in the current experiments might not be able to perfectly operationalize actual aggressive behaviors in real life (e.g., Elson, Mohseni, Breuer, Scharkow, & Quandt, 2014), despite they have been used in prior studies to assess mild aggression (e.g., DeWall et al., 2013; Giancola & Zeichner, 1995; Lieberman et al., 1999). In particular, due to ethical considerations, some participants might treat these aggression tasks as hypothetical and justify their actions by believing that no one would actually immerse their arms in chilled water, receive noise blasts, get stuck with voodoo doll pins, or consume hot sauce based on their actions. It is also important to acknowledge that all the aggression tasks were researcher sanctioned in the experiments. During these tasks, researchers did not stop participants from engaging in these aggressive behaviors, and participants might have perceived that they were justified or even encouraged to do so, even when there was in fact no such cue. This could limit the generalizability of the current findings to unsanctioned aggression, in which people initiatively behave aggressively based on their free will. Because this is an unavoidable shortcoming for experiments, researchers might address this issue by testing the relationships between objectification and actual aggressive behavior with different levels of severity in more naturalistic settings. The use of naturalistic research designs, such as observational studies or field experiments, could increase the generalizability of the current results. In addition, we acknowledged that the manipulation check questions following the objectification manipulation might

differentially influenced participants in the experimental condition and control condition, as the questions may make the goal or task of the experiments more obvious to the participants, potentially producing a demand effect. Further research is required to investigate whether this may potentially influence the observed results.

Fourth, in the current studies, we did not examine how individual differences could possibly influence the effect of objectification on aggression. In future studies, researchers might explore who is more prone to aggressive behavior following objectification. Prior aggression research showed that some types of individuals are more (or less) inclined to behave aggressively after setbacks or provocations. For instance, aggression is more commonly seen in people with narcissism (Bushman et al., 2009) and people with callous-unemotional traits (Kokkinos, Voulgaridou, & Markos, 2016). In contrast, people with strong just-world beliefs (Dalbert, 2009) or growth beliefs who believe setbacks can be overcome through efforts (Cobb, DeWall, Lambert, & Fincham, 2013) tend to react less aggressively in frustrating situations. In future studies, researchers can consider assessing how these (and other) dispositional characteristics might make one more prone to or protect one against objectification experiences.

Finally, the current research revealed that objectification increases aggression through thwarted perceived control. It is still unclear whether nonsexual objectification can lead to other undesirable outcomes. We believe that thwarted control following objectification may carry implications beyond aggressive behavior. For instance, prior research showed that thwarted control leads to various negative outcomes, such as cognitive distortions, impaired well-being, and heightened helplessness (e.g., Agroskin & Jonas, 2010; Drewelies et al., 2017; Infurna & Gerstorf, 2014; Reznik et al., 2017). In future studies, researchers might test whether nonsexual objectification would also promote these (and other) undesirable outcomes through thwarted perceived control and other psychological processes and whether restoring objectified people's perceived control would weaken the detrimental impacts of objectification. Such investigations can undoubtedly advance our current understanding of the impacts of nonsexual forms of objectification.

9. Conclusion

We conducted six experiments to examine the potential impact of nonsexual performance-based objectification on aggression and the underlying psychological mechanism of this effect. The findings showed that objectification promotes aggression, which is mediated by thwarted perceived control. In addition, restoring objectified people's thwarted control can effectively weaken the effect of objectification on aggression. Taken together, these new findings advance our current knowledge both theoretically and practically by showing when and why objectification promotes aggression and how to diminish such an effect. They also create new avenues for future research to further explore various impacts of nonsexual forms of objectification.

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