

Pick Your Poison: Choice of Activity Determines Mood Management Following a Stressful Task

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ABSTRACT



People routinely seek out activities they believe will relieve stress. There has always been debate regarding the extent to which different activities, particularly those with aggressive content, successfully manage mood or worsen it. It is routinely believed that engaging in highly aggressive activities after becoming stressed worsens mood. However, unlike experiments, in real life people generally select activities that match their interests. In the present study, 105 university students were exposed to an acute stressor then randomized to either (a) a time filler control task; (b) to hit a bobo doll; or (c) given a choice of five different activities, some aggressive, some not. Results indicated that those who were given a choice of activities experienced the greatest reductions in stress and hostility. Furthermore, evidence did not suggest that more aggressive activities made participants more hostile, stressed, or aggressive.

KEYWORDS

Catharsis; mood management; stress; video games

Introduction

People routinely seek out activities, hobbies, and behaviors that they believe will assist them in reducing stress. Some individuals may turn to activities that could be perceived as aggressive, such as extreme sports or violent video games (Brymer & Schweitzer, 2013; Griffiths, 1997). Many such individuals may describe such activities as “cathartic.” However, what they describe as catharsis is really mood management, or the use of pleasant activities to reduce stress and improve mood (Bowman & Tamborini, 2012). Confusion between these terms has arguably led to some misunderstanding about what activities may improve mood following stress. For instance, some authors argue that it is a “myth” that venting anger following stress reduces negative affect (Lilienfeld, Lynn, Ruscio, & Beyerstein, 2009) although this issue remains contentious. However, things may be more complex than labeling particular activities as “good” or “bad” for mood management. Rather it is plausible that some individuals respond better to some activities than others,

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with the “match” between individual and activity being more crucial than the activity itself. This has been difficult to document empirically in laboratory studies, given that random assignment to activities is often used, but its possible that random assignment to a condition in which choices are offered could illustrate these matters more effectively. The current study examines whether mood management requires agency in choosing stress-reducing activities. Agency is here defined as the individual’s ability to make informed choices consistent with his or her own desires, motives of inclinations, and take responsibility for those choices.

Clinical Implications of the Catharsis Debate

It is common for clinicians to find clients struggling with anger issues looking for ways to reduce their anger. Many clients may “self-medicate” for these issues, turning to activities such as exercise, aggressive sports, or violent video games to reduce their feelings of anger. Others may ask their therapists to prescribe them activities to help them “vent” their anger. Much debate has ensued about the proper techniques clinicians and their client should employ to reduce anger and stress, whether giving voice to it is effective in ultimately reducing anger and stress.

Part of the contention may stem from differences in approach between clinical psychology and social psychology. The former, particularly in practice, is often concerned with tailoring interventions based on evidence, but also the individual needs of specific clients; whereas social psychology is more concerned with considering group mean differences on laboratory tasks that may or may not relate to the real world very well. The degree to which the latter can inform the former may be unclear given the very different contexts in which observations of catharsis, anger, and stress occur. Further, given the involvement of social psychology in the replication crisis (which, in fairness, has been influencing other areas of psychology and other entire disciplines as well), it may be a good time to reinvestigate notions from social psychology that were once held dear.

Mood Management and Catharsis

As indicated above, some confusion between the terms catharsis and mood management has existed in the field. Catharsis typically refers to engaging in a negative affective experience in order to purge the emotion. Thus, one might allow oneself to experience anger in order to release aggressive drives (Bresin & Gordon, 2013). This approach is consistent with drive-reduction models of behavior popular during the mid-20th century (Buss, 1961). Use of catharsis clinically predates this time, stemming back to the late 19th century when psychoanalytic theorists employed catharsis as a method of uncovering

and releasing unconscious conflicts (Vives, 2011). Further back still, Aristotle's concept of catharsis allowed for the experiencing of tragedy through theater as insight into one's own pain (Turri, 2015). By contrast, mood management focuses on the perspective that engaging in distracting, pleasurable experiences can reduce stress and distress (Bowman & Tamborini, 2015). 80

By the late 20th century, social learning/social cognitive models of aggression had become more dominant and these tended to emphasize the idea of imitation of behavior (Berkowitz, 1990). Much of the debate then began to fall upon potential media effects, which is when, arguably, the confusion between catharsis and mood management began to occur. Specifically, some scholars suggested that viewing violence in media could be "cathartic" (Feshbach, 1961). This view conflicted with the increasingly dominant social cognitive paradigm, which posited that media violence exposure should result in imitative rather than cathartic outcomes. However, both perspectives may have relied upon the problematic assumption that exposure to media violence was experienced as a negative affect event, increasing anger, rather than as a relaxing activity, which would be more congruent to mood management theory. 85 90

Thus, in some cases, proponents of social cognitive theories of aggression set out to demonstrate that venting anger only increases aggression. In a typical study, an individual might have been irritated, then randomly assigned to a neutral activity or an aggressive one such as hitting a punching bag (e.g., Bushman, 2002). Although often considered evidence that venting anger is harmful, such studies had ostensible problems. First, such studies often had obvious demand characteristics (participants guess the study hypotheses and change their behavior to match them rather than provide valid behaviors) and, second, most individuals do not hit punching bags to reduce anger in real life. Some may, but individual responses to anger reduction are idiosyncratic and the match between the individual and the activity may be more crucial than the activity itself. In this case, assigning individuals to a task that was artificial, may have increased frustration in an artificial manner. In essence, such experiments tested a stereotype rather than real-life activity. 95 100 105

It is also important to note that, despite social psychology's apparent aversion to catharsis, some evidence continued to emerge suggesting that, at least in some contexts, catharsis might work as intended. As noted above, Feshbach (1961) found that youth who watched violent television became less aggressive, and cathartic effects were found in some social psychology experiments (Doob, 1970; Doob & Wood, 1972; Manning & Taylor, 1975). Much of this earlier work appears to have been forgotten, or perhaps purged as social cognitive theories of aggression became more popular, and such data became inconvenient. However, recent studies on catharsis have 110 115

provided some further suggestions that catharsis may occur, at least in some contexts (Bresin & Gordon, 2013; Trotter, Eshelman, & Landreth, 2003; Verona & Sullivan, 2008). The intent of this coverage is not to say that catharsis does or does not work—the answer may be complex. However, the concern is that coverage of the evidence for or against catharsis from scholars adhering to a social cognitive world view hostile to catharsis may have over-advertised the evidence against catharsis.

These differing views may extend to clinical work as well where competing paradigms (psychodynamic vs. cognitive-behavioral, the latter of which arguably is closer to social psychology) may be related to differing views of catharsis. Here too, the cognitive behavioral approach to therapy deserves great credit for its evidence-based approach. Yet it's not always clear that laboratory studies of group mean differences provide an adequate data structure for the current question of catharsis, given that so much of the social psychology research on the topic is invariably linked to the problematic and replication-crisis-riddled field of media effects (Savage, 2004).

Mood Management Theory

Unlike either catharsis or social cognitive theories, which suggest that exposure to aggressive activities (media violence, sports, debating, etc.) increases negative affect such as anger, mood management theory suggests that individuals seek out activities, which are pleasant and distracting in order to achieve desired mood states (Bowman & Tamborini, 2015). From this perspective, the content of such activities is less crucial; more crucial is the degree to which activities are perceived by the individual as being pleasant and distracting (Rieger, Frischlich, Wulf, Bente, & Kneer, 2015).

Evidence suggests that engagement with media, such as music (Sleigh & McElroy, 2014), video games (Reinecke et al., 2012), as well as a generally wide variety of media (Oliver, 2003), can reduce stress and improve mood. This includes action-oriented games (Olson, Kutner, & Warner, 2007) or heavy metal music (McFerran, Garrido, O'Grady, Grocke, & Sawyer, 2015; Wooten, 1992) that may traditionally be thought of as aggressive rather than soothing by many. Again, evidence suggests that the match between the individual and their preferences is more important than specific media content (Ballard & Coates, 1995; Labbé, Schmidt, Babin, & Pharr, 2007).

Thus, essential to mood management theory is the ability of individuals to choose activities that they believe will enhance positive mood states. Such a paradigm for study has not matched well with traditional media effects research, employing random assignment to media conditions with the expectation of general media effects. However, some studies have begun to examine the influence of player choice in video game research (e.g., Bowman & Tamborini, 2015). The current study attempts to build upon this prior work

in examining how individuals use agency in selecting activities to reduce stress. We test the following hypotheses in the current study: 160

H1: Individuals who select activities to reduce stress will experience less stress, hostility, and aggressive behavior than either a control group or a random assignment group to an anger venting task. 165

H2: Individuals randomly assigned to an anger venting task will have the highest hostility, stress, and aggressive behavior.

H3: Choice-related activities will not differ from each other in regard to reductions in stress, hostility, and aggressive behavior. 170

METHOD

Participants

The current study participants were 105 students studying at a university in the southern part of the United States. Another seven individuals arrived for the study, but were either under age or did not have time to complete the full procedure, and thus they were excluded from the study. The majority of participants were female ($n = 70$, 70.8%) with a mean age of 19.43 ($SD = 4.92$). 175

Random Assignment

Random assignment of participants occurred to three conditions: (a) a neutral “time filler” control task; (b) an “anger venting” bobo doll task; and (c) the “choice” condition, in which participants could pick between five separate activities (playing a violent video game, a non-violent video game, listening to a radio station of their choice, filling out crossword puzzles, or sitting in the dark). Because each of the choice options were ostensibly separate activities that could differ between them in mood management quality, the randomization procedure was developed so as to include more people in the “choice” condition than the other two conditions. Number of participants in each condition is presented in [Table 1](#). 180 185 190

Materials

Hostile Feelings

Feelings of hostility were operationally defined as the total score on the State Hostility Scale. Developed by Anderson, Deuser, and DeNeve (1995), the

Table 1. Descriptive outcomes for all conditions.

Condition	<i>n</i>	Hostility	Stress	Ice Water (seconds)
Control	15	89.33 (26.78)	44.33 (11.60)	7.07 (3.47)
Venting (bobo)	19	82.89 (18.20)	39.37 (10.80)	5.21 (3.84)
Violent game	14	71.50 (10.33)	34.21 (6.35)	7.86 (2.93)
Non-violent game	23	70.57 (18.82)	36.17 (7.77)	6.65 (3.37)
Music	21	59.71 (12.65)	32.95 (8.50)	6.38 (3.72)
Crosswords	6	74.50 (12.68)	39.17 (12.83)	4.17 (4.92)
Relax/chair/dark	7	67.57 (13.02)	34.57 (5.22)	4.43 (4.76)

Note: Numbers in parentheses are standard deviations.

State Hostility Scale (SHS) is a 35-item, 5-point Likert-type scale in which respondents are asked to report their current mood. A series of adjectives are presented to the respondent and they are asked to rate how strongly they disagree or agree (i.e., 1 = “strongly disagree” and 5 = “strongly agree”) with each word. In this study, the SHS was highly reliable at pretest (Cronbach’s α = .947) and posttest (Cronbach’s α = .945). All 35 items were used for this study.

State Stress

In order to examine current stress, the state anxiety form of the State/Trait Anxiety Inventory (STAI; Spielberger, 1983) was employed. The STAI consists of 20 Likert items, such as “I feel calm” or “I feel nervous,” which measure *current anxiety*. With the current sample the STAI demonstrated good internal reliability at pretest (Cronbach’s α = .922) and posttest (Cronbach’s α = .900).

Aggressive Behavior

Aggressive behavior was measured in this study using an ice water task. In the ice water task, participants were given the opportunity to immerse a female confederate’s hand in a bucket of freezing ice water for up to 10 seconds. Participants were given the opportunity to test the ice water first to see that it was unpleasant. A cover story was used explaining that the experimenters were conducting a separate study on pain tolerance and needed an objective participant to tell the confederate how long to maintain their hand in the ice water for a 10-second maximum. The participant was also informed that if they were uncomfortable with this task, they did not have to perform it (thus providing a no aggression option). A script was used for the confederate to exclaim about the discomfort she was feeling and asking to let her hand be removed from the ice water. This task improves upon previous aggression measures (see Ritter & Eslea, 2005 for discussion) by being more salient, involving a present victim

who, due to the script, clearly wishes to avoid the discomfort of the ice water.

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Frustration Task

The paced auditory serial-addition task (PASAT; Gronwall, 1977) was used to increase frustration in all participants, regardless of the experimental condition, to examine the degree to which different games reduced (or increased) frustration. The PASAT is a computer-based program in which participants must add numbers from 1 to 20 in a sequential order. At the beginning of the sequence, two numbers (e.g., “1” and “2”) are presented and the participant must add these numbers and click on the corresponding sum (e.g., “3”). After clicking on this total, another number (e.g., “5”) is presented on the screen and participants are instructed to add this new number to the last number shown (e.g., “5 + 2”) and, again, click on the corresponding sum (e.g., “7”). The presentation of this sequence gradually increases with time, making the task more difficult. The PASAT has been shown to create an interference effect, since it is a participant’s intuition to add the last number presented with the last sum entered. This interference has been shown to elicit frustration, irritation, and anxiety (Tombaugh, 2006), although it was originally intended to measure cognitive processing speed.

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Exposure Conditions

Several exposure conditions were employed to examine the impact of different activities on stress reduction. First, it was necessary to create a control condition that was neither particularly stressful nor particularly fun or relaxing in order to control for the simple effects of time itself. It is reasonable to expect that people would relax naturally over time following an acute stressor. However, an adequate control condition should be neither particularly stressful itself, nor particularly relaxing. Thus, as a control condition, participants randomized to this condition were asked to fill out several sheets of relatively basic two-digit math problems, all of which were subtraction or addition (e.g., $13 + 45$, $63 - 23$, etc.) Math problems of this nature were used because they are not difficult enough to be stressful (and there was no time pressure), but most people would be unlikely to choose such an activity to reduce stress. As with the choice condition, the duration of this condition was 20 minutes.

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For the venting anger condition, we employed a bobo doll (an inflatable balloon with a weight at the bottom, which is designed to be hit). Participants were simply instructed to hit the bobo doll for a 5-minute duration. For this group, it was felt that a shorter duration was necessary for the venting anger

260

condition because prolonging it to 20 minutes would change the activity from one that could potentially be useful in reducing stress (at least *prima facie*) to one that would become patently ridiculous and increasingly aversive and exhausting. Although varying the duration for this one exposure is less than ideal, it was felt to be more ecologically valid with how venting anger would be employed in the real world (or, put another way, our team was skeptical people would punch a pillow for 20 minutes straight). Differing stress reduction strategies, by their nature, might require differing time commitments.

For participants randomized to the choice condition, they were given a choice of five activities they could engage in. Any five activity choices are, by nature, destined to be an arbitrary representation of the total activities that could be used to reduce stress. However, the activities employed here were selected both to be varied in nature to appeal to a variety of participants as well as practical to employ in the lab (e.g., an exercise regimen would have been a good additional choice, but difficult to employ in a lab setting). The five choices ultimately included playing *Call of Duty* (a violent video game), playing *Forza* (a non-violent video game), solving a set of crossword puzzles, relaxing in a comfortable chair in the dark, or listening to music via internet radio (participants could choose the genre/station). These activities lasted 20 minutes each.

Procedure

Participants were recruited through the department's undergraduate research participant pool consisting of introductory psychology students participating in research for course credit (an alternative assignment was also available). Participants signed up for an appointment time in the lab. Once they arrived they filled out an informed consent form. Following this, they were administered the PASAT to induce stress. The PASAT exposure lasted 10 minutes. Following the PASAT, the pre-test measures were administered to assess stress and hostility immediately following the PASAT. Following this the randomization occurred as discussed above. Following the randomized procedure, participants were administered the posttest measures and the ice water task. Participants were then debriefed.

All data were analyzed in SPSS in accordance with the preregistration described below. Main study analyses (H1, H2) were conducted using 2 (time) \times 3 (group, control, venting, choice) ANCOVA designs, with gender as the covariate. For the ice water task, lacking a pretest, a one-way ANCOVA with gender covariate was used. For the comparison among choice groups, one-way ANCOVAs (with gender and the pretest variable score entered as covariates) were employed.¹

Preregistration

In compliance with transparency in research, the current experimental design was preregistered with the Open Science Framework. The preregistration can be viewed at: <https://osf.io/6ty5s/>.

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Results

Means and standard deviations for all outcomes for all groups are presented in Table 1. As can be seen, although the randomization procedure generally spread out participants into groups, two of the choice groups (crosswords and relaxing in a chair) were less popular than the other options. Inevitably, some unevenness in groups is to be expected when choice procedures are employed.

310

H1 and H2: Effects of Choice on Hostility, Stress, and Aggressive Behavior

Results from the ANCOVA for choice condition on hostility revealed a significant effect for choice condition [$F(1, 101) = 5.99, p = .003, r = .237, 95\% \text{ CI} = .048, .410$], as well as for the choice condition \times time interaction [$F(2, 101) = 3.24, p = .043, r = .176, 95\% \text{ CI} = -.016, .355$], although the interaction effect was weaker. No other outcomes were statistically significant. These results are presented in Figure 1.

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Results from the ANCOVA for choice condition on stress revealed a significant effect for gender [$F(1, 101) = 5.78, p = .018, r = .233, 95\% \text{ CI} = .044, .406$], as well as for the choice condition \times time interaction [$F(2, 101) =$

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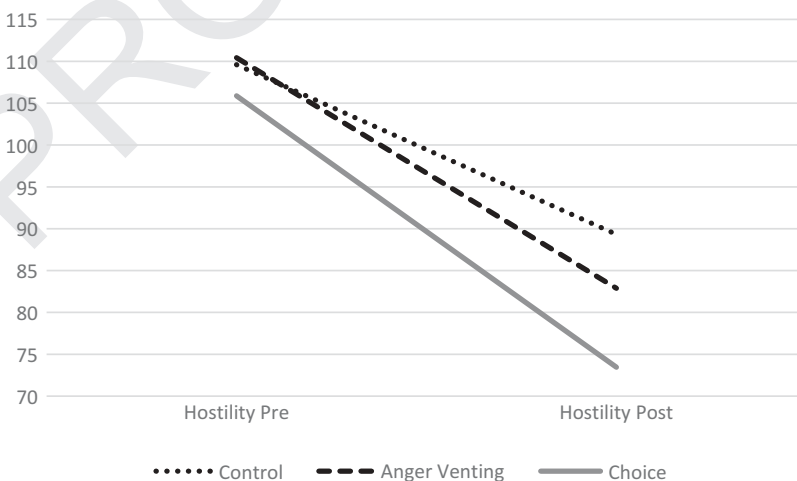


Figure 1. The impact of control, anger venting, and choice conditions on reduced hostility.

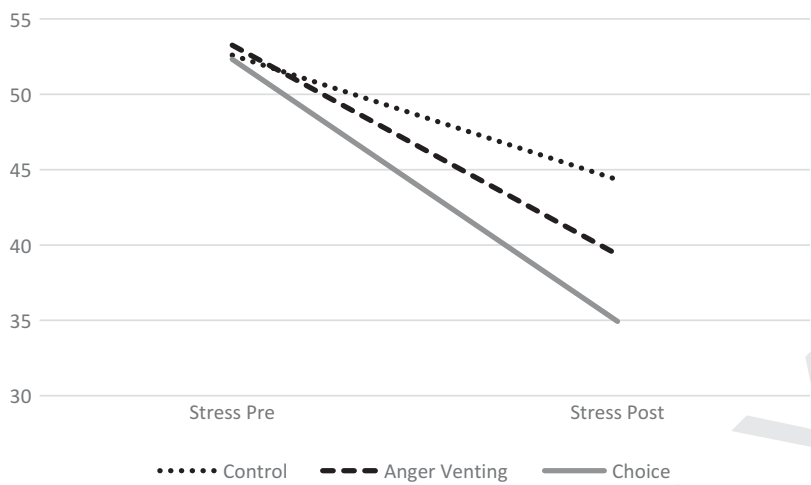


Figure 2. The impact of control, anger venting, and choice conditions on reduced stress.

3.99, $p = .021$, $r = .195$, 95% CI = [.004, .372]. No other outcomes were statistically significant. These results are presented in Figure 2.

For the analysis of choice condition on aggressive behavior, all outcomes were non-significant including the key outcome for choice condition [$F(2, 101) = 1.24$, $p = .293$].

Taken together, these results are supportive of H1 for hostility and stress but not aggressive behavior. Similarly, no evidence emerged for H2, as means for the venting anger condition were lower than for the control condition for all outcomes. The sample size for those two conditions (anger venting and control) is too small ($n = 34$) to allow for meaningful analysis of those two groups alone.

H3: Comparison Between Choice Conditions

Given the reduction in sample size by considering fewer groups, the following analyses are underpowered and should be interpreted with caution. It should also be noted that, as these are chosen activities, results for this analysis should be considered correlational rather than causal. For instance, more aggressive individuals might select violent video games compared to other activities (Breuer, Vogelgesang, Quandt, & Festl, 2015.)

For the analysis comparing choice conditions, choice condition was not found to influence hostility [$F(4, 64) = 2.48$, $p = .053$], although given that this analysis was underpowered, the potential for Type II error, particularly for a threshold result is high. The mean for music listening was visibly lower than the other groups, although this did not achieve statistical significance.

Clearer non-significant results were found for stress [$F(4, 64) = 1.20, p = .321$] and aggressive behavior [$F(4, 64) = 1.18, p = .330$].

Taken together, the results support H3 for stress and aggressive behavior, but the potential for a Type II error in the results for hostility is high.

Discussion

There is still considerable debate and confusion about the degree to which activities, including those that may be considered “aggressive,” can manage moods. The current study sought to examine whether agency in the process of managing moods would have an influence on stress reduction. Results indicated that individuals who were able to pick activities to reduce stress experienced greater reductions in stress and hostility than did individuals in the control or anger-venting group. However, these results did not generalize to aggressive behavior.

In general, these results are supportive of mood management theory, and also support the hypothesis that agency in choosing activities to reduce stress is an important component of this process. Interestingly, even more aggressive activities, such as playing video games with violent content, appear to function positively as a tool for mood management, so long as they are congruent with the player’s choices. Although the impact of such games are likely to be debated for some time, our results are congruent with those suggesting that their negative impact may be minimal (McCarthy, Coley, Wagner, Zengel, & Basham, *in press*).

These results also have implications for experimental designs, wherein individuals may be randomized to certain activities to examine their mood management applicability. Although randomization is obviously an important aspect of the internal validity of experimental designs, it can result in a mismatch between participants and activities. Such mismatches may lead to results that are not very informative about real-world applications. In other words, randomization, although necessary for internal validity, can become a serious threat to external validity, at least in this realm. In the current design, we sought to address this by using a combination of randomized and choice exposure conditions to examine for the difference between them. Such designs may be useful in the future to the extent they may help provide more externally valid results.

Although it was not the intent of this study to replicate this issue specifically, our results did not support common beliefs that engaging in an anger venting activity worsened hostility and stress (Lilienfeld et al., 2009). Although the sample size of the two randomized groups (control vs. anger venting) was too small to allow for a direct comparison, we note that the means for the anger venting condition were lower than for the control condition. Although the outcomes for the choice condition were superior

to anger venting, it appears that the worst one might be able to say about venting anger is that it is about as bad for mood as is doing math. With this in mind, we suggest caution among scholars in labeling “anger venting” a “myth” at least on the premise that it makes anger worse.

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As for why the mood management effects did not apply to aggressive behavior as an outcome, one possibility may have to do with the nature of laboratory aggression tasks themselves. For obvious ethical reasons, such tasks usually involve minor behaviors that are not very harmful. Also, they occur with the implicit sanction of the experimenter. Such aggression measures may seem to be socially sanctioned, which differs from problematic aggression in the real world. Thus, such behaviors may not be salient to the affective elements of stress.

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Although no statistically significant differences were observed between choice conditions, we do note that this analysis was underpowered and that the music condition experienced noticeably lower means on hostility and stress than other choice groups. We would encourage future studies to explore the potential benefits of music (including matching of music genres to individual preferences through choice designs), in particular, on stress. Some research has already examined how even more aggressive music, such as heavy metal, can repair mood (Kneer & Rieger, 2016). And music therapy has been demonstrated to be effective in mood repair among adolescent psychiatric populations (Shuman, Kennedy, DeWitt, Edelblute, & Wamboldt, 2016).

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Clinical Significance

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There are several aspects of this study that may inform decisions clinicians make when advising clients on anger-related issues. First, many clinicians may suggest specific activities that they believe will reduce anger and repair mood. Although some activities may have some specific empirical support compared to others, given that effect sizes in psychological research it is possible that guidance based on group mean differences may be misleading. Mood management appears to be fairly idiosyncratic, meaning that what works for the “average person” may work very poorly for any specific individual. Similarly, what works poorly for the average person may work very well for a specific individual. Thus, it may be of greater value to explore various activities to engage mood management with specific clients rather than assume that a “one size fits all” approach will be effective. Similarly, clinicians are advised not to act judgmentally toward activities to repair moods the clinician may find unsavory (e.g., listening to metal music, playing violent video games, etc.) if such activities appear to legitimately repair mood for some individuals.

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The second issue is that some recent advice has suggested that encouraging individuals to “vent” their anger may only make them angrier. Results from this study suggest that such advice may be misplaced. Individuals engaged in “cathartic” activities actually reduced stress, though not as much as individuals allowed to choose mood management activities. Once again, the impact of specific courses of action may vary from individual to individual considerably, and “blanket” recommendations one way or another may not be constructive. 430

As with all such studies, there are limitations. Our choice of potential stress reducing activities was, by nature, arbitrary and certainly cannot be said to represent all such activities. Secondly, as noted, some of our analyses related to the choice conditions were underpowered, leaving some outcomes unclear. We would highly recommend further studies examining this issue with larger samples. Lastly, our measure of aggressive behavior has limitations, similar to many aggression measures, and may not fully capture real-world aggression. 440

Despite these limitations, we believe our study provides some insight into how individuals use choice and agency to select activities to calm themselves from stress and how agency is important to this process. Ultimately, we argue that mood management is a complex process and proscribing certain activities based on their content (such as violent video games) may be mistaken. We hope our study is helpful to the field and stimulates further discussion. 445

Note

1. The initial preregistration document inadvertently left out the time variable for these analyses. However, given that preexisting levels of the outcome variables may have influenced choices, pretest scores were included as a covariate. It is hereby certified that this correction was made prior to analyzing the data. 450

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