AGGRESSIVE BEHAVIOR
Volume 38, pages 170–174 (2012)

Evidence that Killing Escalates Within-Subjects in a Bug-Killing Paradigm

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Prior research has examined killing behavior using a paradigm in which participants believe (falsely) that they are killing bugs. This work suggests that killing behavior escalates. In the present study, we sought to replicate the basic escalation effect within-subjects. Further, in doing so, we controlled for experimenter "sanctioning" of killing that may have differed with key between-subjects manipulations in the prior research. To control for this possible confound, the present experiment held experimenter instructions constant and examined whether killing naturally escalated within-subjects across two 12-sec bug-killing tasks. Additionally, to verify that escalation is due to killing per se and not just physical practice of the procedure, we manipulated whether the procedure was described as real killing or simulated killing. Results showed that when participants thought they were killing bugs, the number of bugs put into the grinder increased from the first to the second killing task. No such escalation occurred when participants performed the procedure while knowing the killing was simulated. Thus, killing of bugs escalates and is not simply a consequence of perceived sanctioning of killing by an experimenter or simulated practice of the procedure. Aggr. Behav. 38:170–174, 2012. © 2012 Wiley Periodicals, Inc.

Keywords: killing; bug-killing; escalation; violence

INTRODUCTION

> At first killing was obligatory; afterward we got used to it. We became naturally cruel. We no longer needed encouragement or fines to kill, or even orders or advice. – Jean-Baptise Murangira [Hatzfeld, 2006]

It may be that the more a person kills—kills perhaps any form of life in a way that feels morally questionable—the more likely that person is to kill again. In other words, it may be that killing naturally escalates. In the present experiment, we examined this basic escalation hypothesis using a bug-killing paradigm. Theorizing suggests that escalation of killing may occur because repeatedly killing desensitizes people and in turn makes it easier to kill again [e.g. Grossman, 2001], and/or because killing becomes a means of justifying prior killing [i.e. to show others and oneself that the prior killing was and is acceptable; e.g. Darley, 1992; Gross, 2006; Lifton, 1986].

Recent research has begun to test this escalation hypothesis using a paradigm in which people are led (falsely) to believe they are killing small bugs by putting them into an "extermination grinder" [e.g. Martens et al., 2007]. Data suggest that the majority of people view this task as involving some degree of ethical difficulty [Martens et al., 2010]. Experimental research building upon these data has consistently shown a key finding: inducing the obedient killing of five bugs leads to more subsequent volitional killing than inducing the obedient killing of just one bug. Further, research shows that this effect is not due to practice—the effect of initial obedient killing does not occur when participants are told at the outset that the killing is simulated [i.e. not real; Martens et al., 2010]. Thus, the effect of initial killing has to do with killing and presumably its related ethical difficulties (that are absent when people know the killing is merely a simulation).

THE PRESENT STUDY

For the present study, we developed a within-subjects methodology to further test the escalation

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Received 22 August 2011; Accepted 25 October 2011

Published online in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/ab.21412

hypothesis. This within-subjects design likely provides for a more sensitive approach than the previous between-subjects experiments (i.e. reduces variance compared to a between-subjects approach), and in turn, a methodology that may prove useful for future research examining the escalation of killing. Further, in the prior research, the amount of initial killing was manipulated using experimenter instructions to kill one or five bugs. However, in addition to varying the degree of initial killing, the experimenter instructions may have varied the sanctioning of killing as well. In other words, when the experimenter instructed participants to kill five bugs, the experimenter may have sanctioned the unethical act of killing more than when instructing participants to kill one bug. This difference in sanctioning may have, in turn, induced more killing among those initially killing five bugs than initially killing one bug.

The present experiment was designed to control for this potential confound. To do so, a within-subjects design was employed in which participants performed a self-paced bug-killing task twice. Using this design, the degree of initial killing varies with the order of the task—on the second task participants have more prior killing than on the first task—and not with experimenter instructions. If prior killing makes subsequent killing more likely, then more killing should occur on the second task than on the first. On the other hand, if effects in the prior research simply resulted from varying levels of experimenter sanctioning rather than from the degree of initial killing, then levels of killing should not differ from task one to task two.

The present experiment also controlled for the possibility of practice effects—that is, it is possible that people will kill more bugs on a second task than the first simply because with repetition they become more adept at performing the physical movements of the task. As in prior research [Martens et al., 2010], we included a control condition, in which participants performed the same extermination task twice but were informed that the killing was simulated (i.e. that no loss of life would occur). If within-subjects escalation is related to the act of killing and its ethical implications rather than merely to practice, we should observe escalation from the first to the second task when people believe they are killing bugs but not when they know the killing is fake.

METHOD

Participants

Fifty-seven undergraduates at the University of Canterbury participated and were compensated with a ten-dollar voucher. Three participants discontinued the experiment after reading the consent form. Three participants were excluded from analyses because they expressed strong suspicion that they were not actually killing the bugs. One participant could not understand the instructions sufficiently because of difficulties with English. This left 50 participants (21 male, 29 female).

Materials and Procedure

Participants, run one at a time, arrived at the laboratory and were seated at a table behind cubicle partitions. The participant first received an "overview of the study": the experimenter explained that the study looks at "various types of human-animal interactions" and that in "this particular session we'll look at the role of exterminators who deal with bugs." The experimenter informed the participant that the study involves engaging in a bug extermination task and that they would answer questions about this experience after this task. The participant then read a consent form and signed it if s/he wished to participate.

As the participant read the consent form, the experimenter set up the extermination machine on a table out of sight of participant. The extermination machine (Fig. 1) consisted of a coffee grinder with a plastic tube and funnel attached to its side. Dropping a bug into the funnel ostensibly sent the bug into the grinder, though in actuality the tube was blocked and did not lead into the grinder. A button on the side of the grinder turned on the grinder for as long as it was depressed.

Next, the experimenter retrieved the bugs—21 of them, each situated in its own small plastic cup that sat on a plastic tray (Fig. 1). The bugs were slaters—similar to pill bugs—measuring approximately 1 cm in length (Fig. 2). Retrieved from an adjoining room, the bugs were heated for 5–10 sec with a hairdryer.

Fig. 1. The bug-killing machine and tray containing 20 slaters.

Fig. 2. A slater, measuring approximately 1 cm in length.

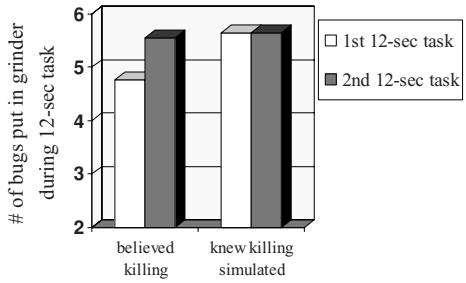

Fig. 3. Bugs killed during the 12-sec tasks as a function of Simulation Knowledge.

This triggered movement, ensuring that participants knew the bugs were alive. The tray with the bugs was then placed next to the extermination machine.

The experimenter escorted the participant to the table with the extermination apparatus and showed the participant the plastic cups containing the bugs. The experimenter indicated that the grinder would serve as the extermination machine. To help justify its use for the task, the experimenter added that "generally, exterminators use poison sprays but we can't use those sprays inside the building for health and safety reasons."

Manipulation of perceived killing. The experimenter subsequently showed half of the participants, randomly assigned, that "the tube attached to the grinder is blocked off, so the bugs that you'll put into the funnel won't make it to the actual grinder and won't be killed." Thus, these participants knew they would be merely simulating the extermination of bugs. In debriefing, participants in the simulation conditions reported thinking of the study in this way, and were not suspicious about the procedures. All other participants remained under the impression that they were exterminating bugs.

Next, to familiarize participants with the extermination task, each participant was instructed to take one cup and drop the bug it contained into the grinder and to turn on the extermination machine by pressing the button for at least 3 sec. Once the participant complied, the experimenter explained that a brief extermination experience would follow.

Extermination tasks. At this point, each participant was instructed to put bugs into the grinder, one at a time, for a 12-sec period; this was ostensibly to ensure that everybody in the study has the same length extermination experience. The participant was asked to perform this task continuously but at his/her own pace. The experimenter handed the participant a digital timer set to 12 sec and said: "When I leave the room, hit the start button and put the bugs into the grinder. When the 12 seconds are up, the alarm will go off. At that point, press the stop button on the timer and turn on the grinder for at least three seconds. I'll come back in once you've finished."

After this extermination task, the experimenter returned and said "Ok, I'd like you to repeat the task again. I'll set the timer again to 12 seconds. When I leave the room you can begin." The participant then performed the task again. The number of bugs put into the grinder in each extermination task served as the dependent measure. After the participant completed the second task, the experimenter re-entered the room and gave the participant a form to record his/her gender and age ($M = 21.94$ years, $SD = 7.99$). The experimenter then assessed suspicion before sensitively debriefing the participant.

RESULTS

To examine whether killing escalates naturally from the first to the second extermination task, we conducted a 2 (Simulation Knowledge: ostensibly real killing vs. openly simulated killing) × 2 (Extermination Task: first task vs. second task) mixed analysis of variance, with Extermination Task as the within-subjects factor and number of bugs put in the grinder as the dependent measure.[1] A main effect for Extermination Task, $F(1, 48) = 6.19$, $p < .05$, was qualified by a Simulation Knowledge × Extermination Task interaction, $F(1, 48) = 4.06$, $p = .05$. Pairwise comparisons (least significant difference) were conducted to examine the interaction. As shown in Figure 3, consistent with the escalation hypothesis, among those who believed they were actually killing, people put more bugs into the grinder during the second task ($M = 5.40$, $SD = 2.40$, $N = 25$) than during the first task ($M = 4.64$, $SD = 1.75$, $N = 25$), F (1, 48) = 10.13, $SE = .24$, $p < .01$, Cohen's $d = .71$. Participants who knew the killing was simulated, however, put the same amount

[1]Gender did not moderate the interaction between simulation knowledge and extermination task, that is, the three-way interaction was not significant, $p > .90$. Thus, we omitted gender from the main analysis.

of bugs into the grinder during the second task ($M = 5.60$, $SD = 1.80$) as during the first task ($M = 5.52$, $SD = 2.14$), $F(1, 48) = .11$, $SE = 24$, $p > .70$, Cohen's $d = .07$.

During the first task, the effect of Simulation Knowledge was nonsignificant, F (1, 48) = 2.53, $SE = .55$, $p = .12$, Cohen's $d = .45$, though directionally showed that participants put fewer bugs into the grinder if they thought they were killing than if they knew they were not. Thus, the pattern suggests that killing was initially inhibited, but that with continued killing, the inhibition disappeared (presumably, by way of desensitization and/or compensatory efforts to justify the prior killing with more subsequent killing).

DISCUSSION

The present study addressed an alternative explanation for prior laboratory research on killing behavior. Prior evidence that killing begets killing comes from experimenter-instructed killing of one vs. five bugs before a self-paced extermination task [Martens et al., 2007, 2010]. As mentioned earlier, this effect may have been due to differences in experimenter instructions and perceived sanctioning, rather than to the ethical/emotional consequences of initial killing per se. Yet, the present findings indicate that killing can escalate even when experimenter instructions are held constant. Increases in number of bugs killed were observed within-subjects, from an initial 12-sec bug-killing task to a subsequent 12-sec bug-killing task.

Additionally, this escalation did not occur in a parallel control condition, in which participants knew they were not killing. Simulation and nonsimulation participants had comparable physical experience and familiarization with the task, yet produced distinct patterns of behavior across the two tasks. The observed behavioral escalation among nonsimulation participants is thus not reducible to practice effects or familiarity. The differing patterns likely emerged because levels of ethical concern differed as a function of the simulation manipulation. Specifically, one possibility is that participants who believed they had killed sought to justify their initial actions through escalated killing. Alternatively, among participants who believed they killed, an initial hesitation to kill may have faded across time (desensitization), yielding higher voluntary killing levels at task 2. By contrast, perceiving the exterminations as simulated likely aroused few ethical concerns, such that the initial killing task did not produce justificatory escalation and/or desensitization.

Killing vs. Nonlethal Aggression

Future work may examine the extent to which escalation of killing is the same and different from escalation of other unethical acts. The desensitization and justification explanations would appear applicable to many or most other ethically questionable acts, but it may also be that differences between killing and other acts render the act of killing particularly vulnerable to escalation. First, killing distinguishes itself because it is an act that cannot be undone and from which the victim cannot recover. Second, amends cannot be made to the victim of killing as they may be made to victims of other unethical acts. Third, the taking of life is likely the ultimate and most severe unethical act imaginable to many people. The justification theorizing puts forth that people may escalate killing in order to avoid dealing with the ethical implications of their act. In as far as the ethical implications of killing are more severe and less able to be atoned for than the ethical implications of other hurtful acts, justification should be more likely or intense following killing than following other negative acts (e.g. injuring or insulting). With experimental evidence accruing for a tendency for killing to escalate, understanding the difference between escalation of killing and other unethical acts seems an important next step.

Theoretical Considerations

Though we have focused on justification and desensitization to explain the observed escalation of killing, alternatives to these explanations should also be considered. A small body of work suggests that nonlethal aggression also tends to escalate, at least under certain conditions [e.g. Bandura et al., 1975; Buss et al., 1972; Goldstein et al., 1975]. Some of the theoretical explanations that have been proposed for this tendency may be applicable to the present results. For one, priming may help account for the observed escalation of killing [e.g. Berkowitz, 1993]. It is conceivable that engaging in killing bugs primes aggression and killing-related thoughts. If this is the case, then those who believed they were killing bugs should have had more killing-related thoughts activated by the first task than those who knew the killing was fake. In turn, these activated "killing" thoughts may have facilitated killing in the second task, thus accounting for the escalation in killing from task 1 to task 2 when people thought they were killing bugs.

It may also be that arousal played a role in the escalation we observed. It is possible that killing bugs in the present experimental context, given the dissonance it appears to evoke, increases physiological arousal. If this is correct, then those led to believe

they were killing bugs in task 1 should have exhibited an increase in arousal relative to those who knew the killing was fake. This heightened arousal may have, in turn, increased the speed at which the participants put bugs into the grinder in task 2 [e.g. Zajonc, 1965], thus accounting for escalation among those who thought they were killing.

Theorizing and anecdotal evidence has also suggested that killing may elicit feelings of excitement or pleasure among the perpetrators [e.g. Nell, 2006]. For example, in a description of combat killing, a commando soldier states: "As time passed I felt better and better. I fell in love with the idea. I felt like a king. Strong. The best. This was the phase in which a covert competition began in our unit of 'who kills more'" [Charny, 2002]. Certainly, killing appears to elicit stress and other aversive feelings such as guilt, and killing appeared somewhat aversive in the present study, but perhaps feelings of excitement or power can arise in conjunction with these aversive feelings. If indeed killing the bugs elicited a degree of pleasure or excitement, then these positive feelings may have motivated increased levels of killing during the second task [Berkowitz, 1993].

Links to Real-World Violence

The impetus of this work was not to develop an understanding of bug-killing per se, but to aid an understanding of situations in which people kill other people. Certainly, situations in which people kill people are very different than the current experimental situation. Generalizing the present outcomes to real-world situations is thus difficult, requiring significant qualification. However, given that the theorized processes for the escalation of killing center around the ethical difficulties of the act, they may be worth considering in conjunction with real-world violence, in which the ethical implications are many times more severe and psychologically potent.

Further, correlational evidence has begun to emerge that parallels these experimental results. In two studies examining U.S. soldiers, those who killed in Iraq and Vietnam have, upon returning home, been more prone to hostility and violence, respectively [Maguen et al., 2009, 2010]. This effect emerges even after controlling for the intensity of their battle experience, suggesting that killing, and not solely exposure to war, is likely driving the association. Thus, there is some evidence that killing precipitates readiness for additional violence and hostility in the real world. Perhaps the results from experimental work examining bug-killing can inform the generation of questions necessary for developing a well-rounded understanding of real-world consequences of killing and violence.

ACKNOWLEDGMENT

We thank Jemma Davies and Saul Gibney for their help with data collection and data entry.

REFERENCES

Bandura A, Underwood B, Fromson ME. 1975. Disinhibition and aggression through diffusion of responsibility and dehumanization. J Res Pers 9:253–269.

Berkowitz L. 1993. Aggression: Its causes, consequences, and control. Philadelphia, PA: Temple University Press.

Buss AH, Booker A, Buss E. 1972. Firing a weapon and aggression. J Pers Soc Psychol 22:296–302.

Charny IW. 2002. Leo Kuper: A giant pioneer. In: Totten S, Jacobs SL (eds). Pioneers of genocide studies. New Brunswick, NJ: Transaction Publishers, pp 267–294.

Darley JM. 1992. Social organization for the production of evil. Psychol Inq 3:199–218.

Goldstein JH, Davis RW, Herman D. 1975. Escalation of aggression: Experimental studies. J Pers Soc Psychol 31:167–170.

Gross JT. 2006. Fear: Anti-Semitism in Poland after Auschwitz. New York: Random House.

Grossman D. 2001. Trained to kill. Professorenforum-Journal 2:3–10.

Hatzfeld J. 2006. Machete season: The killers in Rwanda speak. New York: Picador.

Lifton RJ. 1986. The Nazi doctors: Medical killing and the psychology of genocide. New York: Basic Books.

Maguen S, Metzler TJ, Litz BT, Seal KH, Knight SJ, Marmar CR. 2009. The impact of killing in war on mental health symptoms and related functioning. J Trauma Stress 22:435–443.

Maguen S, Lucenko BA, Reger MA, Gahm GA, Litz BT, Seal KH, Knight SJ, Marmar CR. 2010. The impact of reported direct and indirect killing on mental health symptoms in Iraq War veterans. J Trauma Stress 23:86–90.

Martens A, Kosloff S, Greenberg J, Landau MJ, Schmader T. 2007. Killing begets killing: Evidence from a bug-killing paradigm that initial killing fuels subsequent killing. Pers Soc Psychol Bull 33:1251–1264.

Martens A, Kosloff S, Eckstein-Jackson L. 2010. Evidence that obedient killing fuels subsequent volitional killing beyond the effects of practice. Soc Psychol Pers Sci 1:268–273.

Nell V. 2006. Cruelty's rewards: The gratifications of perpetrators and spectators. Behav Brain Sci 29:211–257

Zajonc RB. 1965. Social facilitation. Science 149:269–274.