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Bad News, Bad Times, and Violence: The Link Between Economic Distress and Aggression

Christopher P. Barlett
Gettysburg College

Craig A. Anderson
Iowa State University

Objective: The current research applied the general aggression model (GAM) to explain the relation between negative societal changes (e.g., indicators of a poor economy) on aggression-related outcomes. One correlational and one experimental study tested the relationships between these variables as well as possible mediating mechanisms. ***Method:*** In Study 1 ($N = 193$), participants completed several measures to assess aggression, stress from current economic crises, and trait hostility. In Study 2 ($N = 101$), participants were randomly assigned to view stressful news videos (clips suggesting the economy is poor) or neutral news videos prior to completing state measures of stress and hostility. ***Results:*** Study 1 found significant positive relations between stress from negative societal changes and aggression, mediated by hostility. Study 2 showed that viewing stressful news videos increased state hostility, which was mediated by state levels of stress. ***Conclusions:*** Overall, results suggest that indicators of poor economic times are related to aggression and hostility. These findings offer theoretical implications for the utility of the GAM in explaining how societal-level shifts in economy-related variables can influence aggression levels at the individual level.

Keywords: aggression, economic strain, stress, frustration, hostility

Every society endures periodic economic downturns that create economic and personal stress on large segments of the population, either from increased costs (e.g., gasoline prices), decreased value of investments (e.g., stocks or homes), or loss of income (e.g., unemployment). The effects of such negative societal events on individuals might lead people to become fearful, frustrated, stressed, and/or hostile. News reports about these negative economic changes may stress even those who are not immediately or substantially affected by the economic shifts, leading to potential changes in stress-related emotional and behavioral variables. Though there is some recent research linking negative economic changes to increases in violence (e.g., Catalano, Novaco, & McConnell, 2002; Catalano, Snowden, Shumway, & Kessell, 2007; Fischer, Greitemeyer, & Frey, 2008; Rosenfeld, 2009), there is very little work on how such effects operate. The purpose of the current research was to test the hypothesis that stress and aggression-related emotions arise from negative societal-level economic changes and that such changes account for a significant portion of the variance in aggression. One correlational and one experimental study tested these hypotheses.

Negative Societal Changes and Aggression

Empirical findings have supported the hypothesis that aggression increases in times of economic stress. Using time series analysis, Catalano and colleagues (Catalano et al., 2002, 2007) showed that changes in unemployment rates were positively related to indicators of violence (see also Yoon & Joo, 2005). Similarly, Rosenfeld (2009) found a

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Christopher P. Barlett, Department of Psychology, Gettysburg College; Craig A. Anderson, Department of Psychology and Center for the Study of Violence, Iowa State University.

Correspondence concerning this article should be addressed to Christopher P. Barlett, 300 North Washington Street, McCreary Hall, Campus Box 407, Gettysburg, PA 17325. E-mail: cbarlett@gettysburg.edu

significant negative relation between gross domestic product and crime. Luthra, Bankston, Kalich, and Forsyth (2007) examined the relation between oil drilling activity and violent crimes. They found that as oil activity decreased, aggravated assault and homicide increased. Finally, Landau (1997) showed a negative relationship between one's current self-reported economic situation (higher numbers indicate a more positive economic situation) and the country's homicide rates for both males and females. Overall, these findings suggest that negative economic changes are related to real-world aggression over time. Although informative, such data are limited in an important way: The data are measured at the macro or societal level rather than the individual level. Therefore, time series analysis cannot provide insights into understanding how *individuals* are affected by negative societal changes.

Some research has elucidated the underlying processes linking economic strain and aggression at an individual level. For example, self-report data link unemployment to higher hostility (Kivimäki et al., 2003) and trait aggression (Fischer et al., 2008). Additionally, Dodge, Pettit, and Bates (1994) found a negative relationship between socioeconomic status (SES) and peer-nominated aggression (see also Åslund et al., 2013). Finally, several researchers have found that levels of depression (Conger, Ge, Elder, Lorenz, & Simons, 1994) and relationship satisfaction (Falconier & Epstein, 2010) mediate the relationship between economic strain and various indicators of aggression.

Only one published experimental study has tested the hypothesis that negative economic news increases aggressive behavior. Fischer et al. (2008) had psychology undergraduate students read a one-page statement indicating that the likelihood of them being unemployed over the next 2 years was either high (80%) or low (20%). Aggressive behavior was measured by the length of time participants assigned other participants to hold their hands in ice-cold water. Aggressive behavior was higher for participants who read the high unemployment passage compared with those who read the low unemployment passage. In brief, this experiment showed that expected unemployment increased aggression.

Theoretical Links

The most common theory used to explain the association of economic distress with high aggression is some version of the frustration–aggression hypothesis (Dollard, Doob, Miller, Mowrer, & Sears, 1939). Berkowitz (1989) argued that the reason why frustration is related to aggression is because frustration is an aversive event, which gives rise to negative affect and either escape or aggressive behaviors. Interestingly, Fischer et al. (2008) found a nonsignificant effect of the unemployment passage on frustration, which suggests that it did not fully mediate the unemployment expectation effect on aggression. Although frustration is a likely product of negative societal changes, other broader factors, such as experienced stress, may be a more plausible or complete mediator. Negative changes in the economy, the price of gasoline, and unemployment are all stressful events. Therefore, the frustration–aggression hypothesis may not fully explain the relationship between economic strain and aggression, as previously thought.

In accordance with our theorizing, several studies have shown that economic strain is related to myriad negative outcomes, but not due solely due to frustration. In their family stress model, Conger et al. (1994) theorized, and found evidence to suggest, that economic pressure (i.e., income loss, increased debt to asset ratio, unstable work, and low per capita income) significantly predicted parent–adolescent financial conflict, marital conflict, and parent hostility 1 year later. Furthermore, Conger et al. showed that Wave 1 economic pressure was related to adolescence's externalizing problems (including aggression) 2 years later, which was mediated by their parent's depression, marital conflict, and hostility. Further corroborating the Conger et al. family stress model, Falconier and Epstein (2011) found that economic strain was related to relationship distress through spousal withdraw.

Despite the evidence suggesting that various indicators of negative societal changes and self-reported economic strain are related to several outcomes (including aggression), as well as the theorizing by Conger et al. (1994) and Falconier and Epstein (2011) to explain such effects, we argue that there is a paucity of research explaining such relationships within an aggression-

related context. As shown by Fischer et al. (2008), the frustration–aggression hypothesis is not an appropriate conceptual model to fully describe such relationships. The general aggression model (GAM; Anderson & Bushman, 2002; DeWall & Anderson, 2011) offers a broad theoretical basis for explaining the relation between negative societal changes and aggressive behavior. GAM posits that personality and situational input variables can either additively or interactively influence one's present internal state, which consists of affects, cognitions, and physiological arousal. These internal state variables drive appraisal and decision processes that ultimately result in either thoughtful or impulsive behavior, which may be either aggressive or nonaggressive. Negative societal changes may be conceived as a provoking situational variable, which may increase levels of aggressive affect, aggressive cognitions, and/or arousal.

In our view, GAM may better articulate the internal mechanisms predicting aggression-related outcomes from economic strain compared with the family stress model (Conger et al., 1994). GAM makes two distinct sets of predictions. First, stress from societal-level economic challenges should be positively associated with aggressive behavior. Furthermore, this effect should be mediated by levels of hostility. The family stress model posits that economic stress predicts parent's hostility (consistent with GAM); however, our model delineates the psychological processes that explain such findings. Second, brief exposure to negative economic news should increase state aggressive affect (i.e., hostility). This short-term effect should be mediated by the extent to which the person is personally concerned by the bad economic news. This prediction cannot be fully explained by the family stress model, which tests long-terms shifts in outcomes associated with negative societal changes, rather than state-based changes after exposure to acute stressors. Taken together, our model posits that stress from poor economic events should be related to aggressive behavior because of an increase in certain internal state variables (e.g., aggressive affect, hostility), and that the reason why hostility increases with poor economic news is at least partly due to increases in self-reported stress.

Overview of the Current Research

Study 1 utilized a correlational design and tested the direct and indirect relationships between trait hostility, stress from negative societal changes, and trait levels of aggression. Study 2 randomly assigned participants to view news clips depicting either stressful societal issues (e.g., rising gas prices, increased unemployment) or a neutral clip to test whether priming economic concerns was related to stress from negative societal changes and state hostility. Both studies tested for mediating mechanisms. Based on the past research and theory, three general hypotheses were tested:

Hypothesis 1: There will be a direct positive relationship between stress from negative societal changes and aggression (Studies 1 and 2).

Hypothesis 2: Hostility will significantly mediate the relationship between stress from negative societal changes and aggression-related variables (Study 1).

Hypothesis 3: Priming economic stressful news will cause changes in state levels of hostility, which will be mediated by state levels of stress (Study 2).

Study 1: Individual-Level Correlational Analysis

Study 1 was a correlational study testing two important questions. First, what is the relation between self-reported stress from negative societal-level economic events and aggression? We measured both premeditated (proactive) and impulsive (reactive) aggression to test what specific type of aggression would be most influenced by stress from negative societal events. Second, what variables likely mediate this relation? We hypothesized that hostility would at least partially mediate this effect.

Method

Participants. One hundred ninety-three participants (61% female) from a large Midwestern university completed the study for partial credit in their psychology classes. The average age of the sample was 19.25 ($SD = 1.94$) years. The majority of participants were Caucasian (76%).

Materials and procedure. Participants completed the following scales and then were thanked and fully debriefed.

Aggressive behavior. To measure aggressive behavior, the Aggressive and Prosocial Behavior Questionnaire (APBQ; Boxer, Tisak, & Goldstein, 2004) was used. This is a 25-item questionnaire that asks participants to rate how much the statements are like them, on a 1 (*definitely not like me*) to 6 (*definitely like me*) rating scale. This scale contains two aggression-related subscales, each consisting of five items. The first measures proactive aggressive behavior ($\alpha = .92$), defined as behavior intended to harm another without provocation. A sample item is, "I often insult people to get what I want." The second subscale measures reactive aggressive behavior ($\alpha = .88$), defined as behavior intended to harm another after a provocation. A sample item is, "When someone makes me angry or upset, I will often hit them for it." Each of the five items was summed for each subscale, such that higher scores indicate higher levels of the measured construct. To show validity, Boxer et al. (2004) showed that males scored higher on the aggression items than females (similar to other measures of aggression; see Bettencourt & Miller, 1996), and aggression scores were positively related to validated measures of normative aggressive beliefs.

Trait hostility. The Hostility subscale of the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992) measured trait hostility. This seven-item questionnaire asks participants to indicate how much items describe them, on a 1 (*extremely uncharacteristic of me*) to 7 (*extremely characteristic of me*) rating scale ($\alpha = .89$). A sample item is, "I wonder why sometimes I feel so bitter about things." Items are summed such that higher scores indicate higher levels of trait hostility. To show evidence of validity, Archer and Webb (2006) showed that this measure significantly correlated with aggression toward one's partner and other same-sex participants.

Stress from economic events. To estimate how much stress participants felt from current economic events (e.g., price of gas and state of the current economy), we created a nine-item Economic Stress Questionnaire (ESQ; see Appendix) that asked participants to indicate their level of agreement with the items, on a 1 (*not at all*) to 7 (*extremely*) rating scale ($\alpha = .88$). A sample item is, "I am feeling anxious about the state of the current economy." Items were summed to create a stress questionnaire; higher scores indicated more stress. To show validity of this new measure, participants in Study 2 also completed several trait level questionnaires (i.e., APBQ and BPAQ) in addition to the ESQ (see procedure of Study 2). Results showed that this measure significantly correlated with reactive aggression ($r = .34$, $p < .01$), proactive aggression ($r = .32$, $p < .01$), trait aggression ($r = .36$, $p < .01$), physical aggression ($r = .32$, $p < .01$), verbal aggression ($r = .21$, $p < .05$), anger ($r = .25$, $p < .05$), and hostility ($r = .41$, $p < .01$).

Results

Data analysis plan. To test the first hypothesis, we first present the results of a correlational analysis that tests the simple relationships between variables of interest. Next, we show the results of several independent *t* tests testing for sex differences. To test the second hypothesis, we show the results of our primary mediational models. GAM predicts that stress from economic concerns should be related to aggression via the internal state (i.e., state hostility). Therefore, mediation tests are appropriate to test our conceptual model. Because proactive and reactive aggression was expected to correlate highly with each other, we tested a mediation model using path analysis (using Mplus Version 6.12; Muthén & Muthén, 2010). Our model had stress predict hostility. Both hostility and stress predicted reactive aggression and proactive aggression (which were correlated). Finally, we also tested whether hostility moderated the relation between stress from economic concerns and aggressive behavior.

Correlational analysis. Bivariate correlations showed that stress due to poor economic conditions was significantly related to proactive aggression ($r = .16$, $p < .05$) and hostility ($r = .38$, $p < .001$), but only marginally with reactive aggressive behavior ($r = .14$, $p = .08$). As expected, hostility significantly correlated with reactive ($r = .46$, $p < .01$) and proactive ($r = .38$, $p < .01$) aggressive behavior. The two measures of aggressive behavior were highly correlated ($r = .69$, $p < .001$).

Sex differences. Independent sample *t* tests were conducted to determine whether sex was related to any of the key variables. Results showed a significant sex effects for reactive aggression, $t(179) = 2.31$, $p < .03$, $d = .34$, and for stress from negative societal changes, $t(170) = 2.11$, $p < .04$, $d = .32$. Males reported higher levels of reactive aggression ($M = 10.97$, $SD = 4.89$) and less stress ($M = 20.90$, $SD = 8.64$) than females (aggression: $M = 9.22$, $SD = 5.08$; stress: $M = 23.78$, $SD = 8.87$). No other effects were significant.

Path analysis. Recall that our path model had stress directly predicting hostility, reactive aggression, and proactive aggression. In addition, hostility predicted both forms of aggression (which were correlated). Because all paths in the model were estimated, the model was a perfect fit for the data. Figure 1 shows the standardized regression coefficients. As expected, stress predicted hostility, which, in turn, predicted both forms of aggression, showing the indirect effect. Indirect model tests further confirmed the mediating effect of hostility in the relation between economic stress and reactive aggression (indirect $b = .15$, $p < .001$) and reactive aggression (indirect $b = .19$, $p < .001$).

Moderation analyses. A hierarchical linear regression was conducted to test whether hostility moderated the relationship between stress due to economic strain and aggression. Stress from economic strain and hostility were entered in the first step and the interaction was entered in the second step. Both variables were centered prior to the creation of the interaction term. Moderation tests were conducted for reactive and proactive aggressive behavior separately.

For reactive aggression, results showed a significant main effect of hostility, as expected ($b = .23$, $SE = .04$), $t(150) = 5.64$, $p < .001$. However, there was no hint of moderation ($b = .003$, $SE = .004$), $t(150) = .89$, $p = .37$.

For proactive aggression, results showed a significant main effect of hostility ($b = .13$, $SE = .03$), $t(152) = 4.14$, $p < .001$. However, there was a marginally significant Hostility × Distress interaction ($b = = .01$, $SE = .003$), $t(152) = 1.83$, $p = .07$. A simple slopes analysis was conducted to test if the relationship between stress due to economic concerns was related to proactive aggression at high (+1 *SD*) and low (−1 *SD*) levels of hostility. Results showed that none of the slopes were significant (all *p*s > .10); however, the directions of the slopes differ as a function of hostility. At high levels of hostility, stress is marginally positively related to proactive aggression, whereas at low levels of hostility, stress is marginally negatively related to proactive aggression.

Discussion

Consistent with predictions, we found that economic stress was positively related to proactive aggression and that hostility was a significant mediator. One limitation of this study is its correlational nature. Study 2 experimentally tested the relation between being primed regarding economic stress aggressive affect.

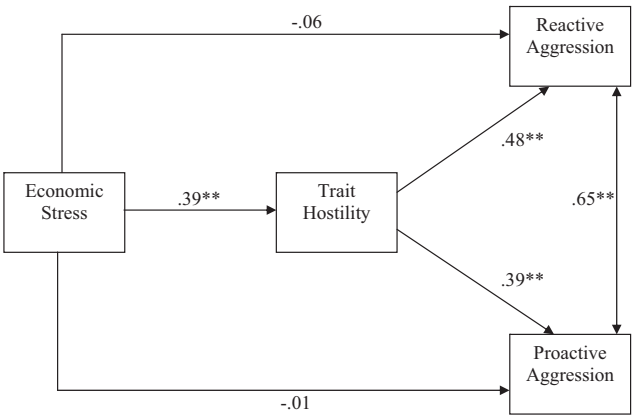

Figure 1. Results from path model (Study 1). * $p < .05$. ** $p < .01$.

Study 2: Individual-Level Experimental Analysis

The previous study supports the hypothesis that negative economic changes lead to increased aggression. However, it is unknown whether economic stress *causes* changes in aggression-related outcomes. Study 2 tested whether primed economic stress increases aggressive affect and whether stress mediates this relation.

Method

Participants. One hundred sixty-eight participants (29% male) from a large Midwestern university completed the study for partial credit in their psychology classes. The average age of the participants was 19.36 ($SD = 1.36$) years. The majority of participants were Caucasian (74%).

Materials.

Video clips. Two different video clips depicted news reports that described how the price of gasoline in the United States is going to rise and the value of the U.S. dollar is decreasing. Participants in the stressful condition viewed both clips, which together lasted approximately 3.5 min. Participants in the neutral condition viewed two separate video clips depicting news reports that did not mention the price of gasoline or the state of the economy. One news report discussed findings from a local spelling bee; the other discussed purchasing tips for how to buy a new mattress. Together, these clips lasted approximately 5 min. Each clip was shown on the computer using the YouTube Web site.

These clips were carefully selected for various reasons. We first prioritized content of the news clips. Specifically, we wanted the stressful clips to explicitly state how the economy (assessed via the value of the U.S. dollar and rising prices of gasoline) was poor, whereas the neutral clips could not mention any of these issues (whether good or bad). Second, we did not want the length of the news clips to last more than 10 min. Indeed, the two neutral clips lasted approximately 5 min and the two stressful clips lasted approximately 3.5 min. Although these times do differ, they are not drastically different. The first author reviewed several video clips until these two conditions were met; however, only a few choices remained. Indeed, it was difficult to find news clips from 2008 to 2009 that did not discuss the economy and were short, and, therefore, we were unable to match the video clips on other dimensions, such as journalist sex or location in which the news was given (e.g., one of the neutral news clips was delivered by a reporter outside, whereas the others were delivered from news reporters sitting inside a broadcasting station).

Postvideo attention questionnaire. Because data were collected online and at the participant's convenience (see Procedure section), we included two multiple-choice questions that tested whether participants actually paid attention to the video clips they were assigned to view. These questions asked participants to indicate what the video clips described in relation to the price of gasoline and the state of the current economy. This is a primary concern for the current study, because participants who did not view (just clicked the advance button) or paid little attention to the video clip may render our manipulation invalid. Indeed, several researchers have identified participant attention to the questions and other stimuli as a valid concern when collecting data online (Berinsky, Huber, & Lenz, 2011; Mason & Suri, 2013; Oppenheimer, Meyvis, & Davidenko, 2009; Paolacci, Chandler, & Ipeirotis, 2010). In fact, research by Berinsky et al. (2011) showed that up to 40% of online respondents failed to accurately answer a manipulation check about a stimulus. Furthermore, Oppenheimer et al. (2009), who tested the validity of using an attention-eliciting question in online data, showed (a) that 14% to 46% of participants failed to answer the attention question correctly, (b) that failure to answer the attention question presupposes that participants did not carefully read the instructions for other questions, (c) that participants who failed the attention question were also less motivated, and (d) "that participants who fail the IMC [the attention question] are a source of noise and that eliminating them will increase the power of experiments" (p. 870).

Thus, the forthcoming results reflect those participants who answered the two multiple-choice questions accurately, suggesting they did pay attention to the video clips. Sixty-seven (40%; consistent with Berinsky et al., 2011, and Oppenheimer et al., 2009) participants failed to get these questions correct. This left 101 (27%

male) participants with an average age of 19.24 (SD = 1.31) who were mostly Caucasian (75%). Independent t tests and chi-square analyses showed that those who were excluded did not significantly differ from those included in the analyses in terms of sex (χ^2 = .73, p = .39), condition (χ^2 = .62, p = .43), state hostility, $t(148)$ = .41, p = .68, state stress, $t(158)$ = .99, p = .32, or perceived arousal, $t(153)$ = .07, p = .94.

Trait aggression. The BPAQ (Buss & Perry, 1992) was used to measure levels of trait aggression. This 29-item questionnaire asks participants to indicate how much items describe them, on a 1 (*extremely uncharacteristic of me*) to 7 (*extremely characteristic of me*) rating scale (α = .93). A sample item is, "Once in awhile, I cannot control the urge to strike another person." Certain items are reverse scored and summed such that higher scores indicate higher levels of trait aggression. To show evidence for validity, Archer and Webb (2006) found that each of the four subscales of the BPAQ significantly correlated with aggressive behavior targeted toward partners and same-sex others for both male and female participants.

State hostility. The State Hostility Scale (SHS; Anderson, Deuser, & DeNeve, 1995) was used to measure state levels of aggressive affect. This 35-item questionnaire (e.g., "I feel angry") asks participants to respond to how they are feeling right now, on a 1 (*not at all*) to 5 (*extremely*) rating scale (α = .94). After reverse scoring relevant items (e.g., "agreeable"), scores are summed so that higher scores indicate higher levels of aggressive affect. To show evidence of validity, Anderson and Carnagey (2009) found higher scores on state hostility for those who played a violent (vs. nonviolent) video game.

Perceived arousal. The Perceived Arousal Scale (PAS; Anderson & Dill, 2000) was used to measure state levels of the perception of how aroused a participant feels. This is a 24-item questionnaire (e.g., "alert" and "excited") that asks participants to respond to how they feel right now, on a 1 (*very slightly or not at all*) to 5 (*extremely*) rating scale (α = .89). Certain items are reverse scored and summed, such that higher scores indicate high levels of arousal. This measure is important to include because if significant differences emerged, then perceived arousal would have to be added as a covariate (see Anderson & Dill, 2000). To show validity of this measure, Anderson et al. (1995; Study 1) showed that participants who were randomly assigned to be frustrated had significantly higher levels of arousal relative to those not frustrated. Furthermore, Anderson et al. (1995; Study 2) showed that perceived arousal was significantly increased from the start of the study (baseline) to after participants were asked to complete simple callisthenic exercises.

State stress. After viewing the assigned clip, participants reported their current level of stress on nine items using a 1 (*not at all*) to 7 (*extremely*) rating scale. Five of the items loaded highly on the theoretically relevant dimension of stress ("stressful," "concerning," "scary," "confusing," and "worrisome"; α = .87). This scale served as a manipulation check and as a potential mediator of the experimental effect on state hostility. This stress scale is not the one presented in the Appendix. Rather, this scale specifically measured how stressed participants feel right now as a function of the video clip they were randomly assigned to view. Further, these items loaded onto a single stress factor based on results from an exploratory factor analysis. The use of researcher-created questionnaires to measure relevant state variables is not new to media psychology. For instance, to measure how violent, arousing, and difficult certain video games are to play, Anderson and Ford (1986) created and used the video-game rating sheet. In addition, to assess the psychological impact of cyberbullying, Beran and Li (2005) asked cyber victims how they felt using single-item questions (e.g., angry, sad).

Procedure. Data were collected using an online data collection Web site (SurveyMonkey.com). Participants completed the study at their convenience. Participants were told that they would be completing an online study regarding one's feelings and thoughts regarding news media. Upon completion of the informed consent, participants completed filler questionnaires (including the demographic, trait aggression [BPAQ], APBQ, and stress from economic events scales). Participants then viewed one of the two pairs of news clips. After viewing the clips, participants completed the PAS, SHS, Stress scale, and the two postvideo attention-check questions. Participants were then thanked and fully debriefed.

Results

Data analysis plan. Akin to Study 1, first we present the data from correlational analyses testing the simple relationships between relevant variables. Then, several independent *t* tests were conducted to determine whether the scores on the questionnaires differed by sex of participant. Research in the media-violence domain has suggested that when randomly assigning participants to view different media depictions (e.g., stressful vs. neutral news clips), these clips must be matched on several dimensions (Anderson et al., 2010). In accordance with this suggestion, we conducted an analysis of covariance to test whether the two news clips differentially impacted self-report levels of arousal. If significance is found, then arousal will be statistically controlled in subsequent analyses. To test the main hypotheses of this research, we test whether the news clip affected levels of state hostility, and whether stress from the news clips mediated this relation. To test the mediation hypothesis, we used the Preacher and Hayes (2008) method to examine whether stress mediated the economic stress priming effect on aggressive behavior. This method estimates the bootstrapped estimates of the indirect effects and computes 95% confidence intervals around the product of the unstandardized regression coefficients for the *a*-path (independent variable to mediator) and *b*-path (mediator to dependent variable). If the confidence interval excludes 0, this suggests significant mediation.

Correlational analysis. Results showed that state stress was significantly correlated with state hostility ($r = .29$, $p < .01$), but not with any other variable (all ps $> .50$). As expected, state hostility was positively correlated with trait aggression ($r = .36$, $p < .01$), but negatively correlated with perceived arousal ($r = -.30$, $p < .01$). Finally, trait aggression and perceived arousal were unrelated ($r = -.18$, $p = .10$).

Sex differences. Males ($M = 89.50$, $SD = 27.04$) scored significantly higher on trait aggression than females ($M = 75.78$, $SD = 23.44$), $t(96) = 2.46$, $p < .05$, $d = .50$. No other effects were found (all ts $< .50$; all ps $> .50$).

Perceived arousal. A one-way ANCOVA with the video-clip condition as the independent variable and trait aggression as a covariate was conducted to test whether priming different types of economic news affected perceived arousal. Results yielded a nonsignificant main effect of condition, $F(1, 85) = .50$, *ns*. Those in the stressful-clip condition ($M = 68.92$, $SE = 1.95$) and the neutral-clip condition ($M = 71.09$, $SE = 2.35$) reported similar levels of arousal. This suggests that participants were equally aroused by the news clips. The results were similar when sex was added as a covariate in the model.

State hostility. A one-way ANCOVA with the video-clip condition as the independent variable and trait aggression as a covariate was conducted to test whether priming bad economic news affected aggressive affect. Results yielded a significant main effect of condition, $F(1, 85) = 5.14$, $p < .03$, partial $\eta^2 = .06$. Those in the stressful-clip condition ($M = 81.58$, $SE = 2.64$) reported significantly more hostility than those in the neutral-clip condition ($M = 72.32$, $SE = 3.09$). Trait aggression was a significant covariate, $F(1, 85) = 16.19$, $p < .001$, partial $\eta^2 = .16$, $B = .33$. The results were similar when sex was added as a covariate in the model.

We then tested whether stress from the post video questionnaire mediated the relation between video-clip condition (coded 1 = stressful, 0 = neutral) and state hostility. Results showed significant mediation (indirect-effect $b = 8.67$, 95% CI [1.06, 17.89]). Video-clip condition significantly predicted stress ($b = 9.37$, $SE = 1.15$), $t(88) = 8.14$, $p < .001$, which predicted state hostility ($b = .93$, SE = .38), $t(88) = 2.42$, $p < .03$, showing the indirect effect.

Discussion

Study 2 showed that brief exposure to stressful economic news can cause an increase in aggressive affect. This experimentally induced effect was mediated by state levels of stress.

General Discussion

There are few studies testing the psychological consequences of negative societal economic changes (Fischer et al., 2008). Studies 1 and 2 suggest that, at the individual level, stress from negative societal changes is related to aggression-related variables, using correlational and experimental designs, respectfully. More importantly, we also elaborated on the underly-

ing processes. Study 1 found that hostility from economic stress is positively linked to both proactive and reactive physically aggressive behavior, whereas Study 2 found that stressful news clips about poor economic times caused increased aggressive affect through stress.

Theoretical Explanations

Multiple theoretical viewpoints have elucidated the underlying mechanisms regarding how situationally induced aversive events can lead to changes in aggressive behavior. The GAM (Anderson & Bushman, 2002) posits that brief reminders of poor economic times may activate aggression-related internal states. Any or all of the internal state variables guide decision and appraisal processes that predict aggressive or nonaggressive behavior. Results from the current study are consistent with this theorizing. Using a cross-sectional design, results from Study 1 showed that stress from the economy is positively related to several indices of aggressive behavior (reactive and proactive aggressive behavior), due to the mediating influence of hostility. In other words, the reason why stress from the poor economy is related to aggressive behavior is indirect through hostility, an internal state variable. Study 2 experimentally induced stress via news clips depicting a poor economic situation or a neutral clip. Results showed that those who viewed the former video clip had higher scores on state hostility due to an increase in stress. In short, the reason why brief reminders of a poor economy is related to aggressive affect (hostility) is because of an increase in stress.

These findings demonstrate a theoretically consistent argument for why economic stressors are related to aggressive behavior—one that has not been tested in past research. Namely, poor economic news acts as a stressor, which, in turn, predicts hostility and subsequent aggressive behavior. Although our research (specifically, Study 2) is limited by not testing aggressive behavior, both studies reported here provide evidence for such a position.

Limitations and Future Directions

Several limitations warrant mention. First, data from Study 1 are correlational, thus making causal inferences from this data risky. It would be beneficial in future research to experimentally instruct participants to ruminate about (or to reappraise) their aggressive affect after exposure to economically stressful primes (e.g., see Bushman, 2002), and to test subsequent mediation and moderation effects on aggressive affect and behavior.

Second, we did not test aggressive behavior in Study 2. We believe that prior to measuring behavior, research must gain insight into the underlying processes that predict behavior. Recall that GAM predicts that after a situationally induced provocation (e.g., exposure to stressful news clips), one's internal state (consisting of aggressive affect, aggressive cognitions, and physiological arousal) changes, causing downstream changes in the appraisal and decision-making process, and eventually influencing aggressive behavior. The purpose of Study 2 was to gain insight into which (if any) internal state variables are changed as a function of such economic primes. Future experimental studies could test this additional aspect of our model by measuring aggressive behavior and testing mediation and moderation effects.

Third, neither Study 1 nor Study 2 measured participant's income level to test possible relations with aggression and, more importantly, stress from economic concerns. Furthermore, the current research was limited by using a college-aged sample that may be less concerned about economic affairs relative to a sample of people currently in the workforce. However, given that our results were found in a college-aged sample suggests that the results may be similar or even stronger if a sample of working participants was tested. Indeed, Fischer et al. (2008) found that the self-perception of aggressive acts was higher when unemployed participants were made aware of a bleak job market, similar to the results found with undergraduate students. Future research should either compare unemployed and employed non-college-aged samples on their levels of aggression (similar to Fischer et al., 2008) or measure several economic-related indicators in undergraduate samples (e.g., if they have a job, how much money they make a month, how much money their parents/guardians make a month, how much financial support participants receive from financial aid or parents/guardians).

Fourth, the ESQ that we created and used in Study 1 was developed to assess stressors related to negative societal changes that impact the economy specific for the time of data collection. At the

time of data collection, there was much news covering the increase in the price of gasoline and the high unemployment rate. Thus, we created a questionnaire to assess how stress was related to a wide variety of economic issues. Evidence for convergent and predictive validity were only reported here. We chose not to use other questionnaires that assess the amount of economic hardship (e.g., Family Economic Strain Scale [FESS; Hilton & Devall, 1997], In Charge Financial Distress/Financial Well-Being Scale [Prawitz et al., 2006]) because some of the items may not be particularly relevant for undergraduate college-aged samples. For instance, the FESS includes items such as "I have put off getting medical care for family members because of the expense" and "I have put off getting dental care for family members because of the expense," which are better suited for head-of-household decision makers (not likely an undergraduate student). However, future research should utilize several economic concern questionnaires to determine the correlations among these various scales and their correlations with hostility and aggression.

Research Implications

Results from the current research shed light on how stress from negative societal changes is related to aggression-related outcomes. The majority of the research in this domain has largely focused on time series analyses, showing that when various indicators of economic instability are present, aggression tends to increase (e.g., Catalano et al., 2002, 2007). Additional findings have shown similar patterns of responding using correlational (Åslund et al., 2013) and experimental data (Fischer et al., 2008). However, we are unaware of any published study within the aggression domain that has tested what variables might mediate and moderate these relations. Derived from the GAM (Anderson & Bushman, 2002), we found support for the hypothesis that economic stress is related to trait levels of aggression through increases in hostility (Study 1), and that priming participants with stressful economic news was related to higher levels of state hostility through increases in state stress (Study 2).

The results of Study 2 are especially novel, as we are aware of only one published study that randomly assigned participants to receive economic stressful information or neutral information (Fischer et al., 2008). The current study adds to the innovative work of Fischer et al. by further testing the underlying psychological processes that predict when hostility will be heightened. Fischer et al. found that frustration did not mediate the relation between economic stressful primes and aggressive behavior. Our research shows that hostility may be a key mediator; however, future work will need to test this speculation.

Clinical and Policy Implications

Over the course of time, different factors may cause stress due to societal changes. Now that the economic turmoil of the 2008 to 2009 recession is stabilizing (in the United States), other societal-level events may trigger stress, which is clearly related to aggression-related outcomes. Stress from the seemingly constant changes in the value of the dollar (peso, yen, euro, and other monetary notes), public policy referendums related to restricting firearms, global warming, or myriad other *societal*-level issues may negatively affect *individuals*.

Thus, our research has several clinical implications. First, mental health professionals need to be aware that such economic stressors are related to a variety of negative health outcomes, including aggression. Indeed, research has shown that stress from economic strain is related to depression (Conger et al., 1994), anxiety (Pearlin & Radabaugh, 1976), marital problems (Conger et al., 1990), and alcohol abuse (Khan, Murray, & Barnes, 2002); however, there are limited numbers of studies showing the relations between economic strain and aggression at the individual level. Our research offers support for such relations.

Second, the current study adds to the aggression literature by identifying the processes by which stress from negative societal changes are related to aggression-related outcomes. It is important to continue to understand (a) the factors that directly predict aggression, (b) for whom these effects are strongest for (moderation), and (c) what psychological processes underlie such effects (mediation). With continued study, replication, and enhancement and application of theory, we hope that interventions can be designed, implemented, or modified to take such findings into account to reduce aggression.

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Appendix

Economic Stress Questionnaire (Used in Studies 1 and 2)

Please respond to the following statements about how you feel RIGHT NOW. Use the provided scale.

1 Not at all
2
3
4
5
6
7 Extremely

1. I am feeling anxious about the state of the current economy
2. Thinking about the economy keeps me up at night
3. Thinking about the economy give me "butterflies" in my stomach
4. I am worried about not being able to find a job when college is over
5. The current job market is scary for me to think about
6. I try to avoid the news because of all the constant bad news about the economy
7. I am worried that the price of gas will get so high that I cannot drive my vehicle
8. Concern over the price of gas has kept me up at night
9. I get anxious when I drive by a gas station and see how much a gallon of fuel costs

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