

BRIEF REPORTS

Development of the Cognitive Appraisal and Understanding of Social Events (CAUSE) Videos

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This study describes the development and validation of 4 videos designed to assess adolescent cognitive appraisals and understanding of social events (the CAUSE Videos). Story lines varied in outcome (2 negative and 2 ambiguous). Convergent and divergent validity were tested in samples of college freshmen and sophomores. As hypothesized, threatening interpretations during ambiguous situations were positively associated with trait hostility (convergent validity) but were not significantly associated with aggression (divergent validity). Negative video interpretations were not significantly associated with hostility or aggression. These videos provide a valid method for assessing adolescents' appraisals of ambiguous and negative social situations in a laboratory setting and may be used to test hypotheses about cognitive processes underlying associations such as that between low socioeconomic status and health in adolescents.

Key words: socioeconomic status, cardiovascular reactivity, interpersonal stress

The present study focuses on the development of a methodology to study one psychological construct that is thought to be linked to health: cognitive appraisals of stressful social situations (Lazarus & Folkman, 1984). In this study, we developed a video-based measure of cognitive appraisal. Our study was based on a specific theoretical model that begins with the premise that individuals from low-socioeconomic status (SES) backgrounds, because of the more stressful and unpredictable environments they grow up in, develop a tendency toward making threat interpretations when presented with ambiguous situations. We hypothesize that this tendency then leads low-SES adolescents to become more physiologically reactive in these situations, which over the long-term may predispose them to a variety of health problems (Chen & Matthews, 2001). The focus of this article is on testing the validity of this new video-based measure of cognitive appraisal. We view this phase of developing and validating a new measure as critical for laying the foundations for testing our larger theory.

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Cognitive Appraisals in Adolescents

Previous research has documented the tendency in certain individuals to make threat appraisals when presented with ambiguous information. For example, some social situations are clearly negative in terms of their outcome (e.g., someone hits someone else), whereas others are ambiguous in outcome (e.g., someone laughs at a comment someone else makes; this is ambiguous because it is unclear whether the person that laughs thought the comment was witty or stupid). Anxious individuals are more likely to judge situations with ambiguous information as negative (Barrett, Rapee, Dadds, & Ryan, 1996; Chen, Lewin, & Craske, 1996; Vasey, Daleiden, Williams, & Brown, 1995). Aggressive children are more likely to make threat interpretations when the intent of a story character is left ambiguous but the outcome is negative (ambiguous provocations). An example is a peer bumping into someone and spilling milk on them: Spilling milk is a negative outcome, but it is unclear whether this was done intentionally or accidentally (Crick & Dodge, 1996; Dodge, 1980; Dodge & Price, 1994; Dodge, Price, Bachorowski, & Newman, 1990).

SES and Cognitive Appraisals

Low-SES individuals may exhibit similar appraisal tendencies. These individuals are more frequently exposed to unpredictable and stressful environments (Brady & Matthews, 2002), which may lead them to develop a schema about the world being a threatening place that requires constant vigilance. As a result of this vigilance, low-SES adolescents may be more likely to make threat appraisals in situations involving ambiguous outcomes. Interpretations of negative outcome situations, in contrast, are not expected to differ by SES, because there is no threat for which to be vigilant (i.e., the outcome is already known). Our previous research (Chen & Mat-

thews, 2001) found preliminary support for this hypothesis, demonstrating that low-SES children report more threatening attributions than high-SES children in response to hypothetical stories with ambiguous outcomes. In contrast, no differences were seen by SES for negative outcome situations.

How Can Cognitive Appraisals Be Measured in Adolescents?

Previous approaches to measuring children's cognitive appraisals have often relied on written hypothetical scenarios (Crick, 1995). One limitation to these techniques is that they are susceptible to variations in reading skills and imaginative ability. If reading skills are distributed by SES, these written measures may not be effective for accurately measuring interpretations in low-SES groups. A presentation format with both visual and auditory cues may make it easier for children to imagine themselves in the hypothetical situation.

The few videos that have been developed to tap cognitive appraisals have targeted children younger than adolescents and have included only negative outcome videos. The primary goal of the current study was to test the validity of a video-based measure of cognitive appraisal appropriate for adolescents. The cognitive appraisal and understanding of social events (CAUSE) videos were specifically designed to depict either ambiguous or negative outcome situations involving potential psychological threats. To test the convergent validity of these videos, we measured cynical hostility. We hypothesized that those who made more threat interpretations during an ambiguous situation would have higher levels of trait cynical hostility. In contrast, we did not expect interpretations during negative situations to be associated with cynical hostility (because both hostile and nonhostile individuals could interpret a negative situation in a negative way). To test divergent validity, we examined associations of aggression with interpretations of the ambiguous videos. Given that previous research has demonstrated associations only between aggression and negative outcome situations, we expected no significant association of aggression with ambiguous outcome situations. In addition, because our negative videos differed from Dodge's (1980) videos by depicting psychological threats (as opposed to physical threats, such as being hit), we did not make a prediction about being able to replicate his finding of associations between aggression and interpretations during negative outcome videos.

According to our theory, we hypothesized that low SES would be associated with greater threat interpretations during the ambiguous outcome videos but not during the negative outcome videos. We conducted preliminary analyses of these associations. However, the larger goal of this line of research was to develop a new measurement tool that could be used by researchers interested in the relationships between cognitive appraisals and health outcomes.

Phase I

Method

Participants

Phase I of this validation study involved ratings made by a group of 12 individuals with backgrounds in psychology (5 PhD psychologists, 4 PhD

students, 2 MA-level staff members, and 1 BA-level long-time staff member on the research team).

Materials

Twenty vignettes were developed by Edith Chen (10 ambiguous and 10 negative). These vignettes consisted of a paragraph description of a social situation relevant to older teenagers. Raters were asked to denote what type of story each vignette was (ambiguous or negative), their certainty in rating the story type (i.e., how sure they were about the story type, rated on a 5-point scale), the likelihood of positive and threat interpretations of the story (each rated on a 5-point scale), and the extent to which each story had a theme related to SES (SES relevance; 5-point scale).

Results

Phase I involved selecting the 10 best vignettes (out of 20), which met certain thresholds for validity based on the consensus of our panel of psychology-trained raters. First, the majority of raters had to classify an ambiguous story as ambiguous and a negative story as negative for it to be considered further. This step eliminated two negative stories. Second, certainty of story type was examined among those raters who were in the majority. Only stories for which raters were quite confident about their story-type ratings ($M > 3.5$ out of 5) were retained. This step resulted in three ambiguous stories being eliminated. Thus, with respect to story type, a total of eight negative and seven ambiguous stories were agreed on by a majority of raters.

Next, raters were asked to evaluate their own impressions of the likelihood of positive and threat interpretations for each situation. We sought vignettes that would elicit a range of interpretations across people. Vignettes that did not produce at least a 3-point range (out of 5) across raters were eliminated (one negative story).

Finally, the least SES-relevant stories were dropped ($M < 2.5$ on a 5-point scale); one ambiguous and two negative stories were eliminated. We were then left with five negative stories and six ambiguous stories. We eliminated one ambiguous story so that each ambiguous and negative story would take place in the same location.

Phase II

Method

Participants

Phase II of validation involved testing the 10 selected vignettes with a sample of college students. Fifty-five college freshmen and sophomores participated in the study in return for course credit (41 women and 14 men; 40 Caucasian and 15 African American; mean age = 18.33 years). We tested participants who were recent graduates of high school so that the sample would represent late adolescence.

Materials

Scenario vignettes. Ten vignettes were given to study participants. For each vignette, participants rated the likelihood of one threatening and one positive interpretation being true (5-point scale). Participants also were asked how angry and threatened they would feel on a 5-point scale.

SES measure. Participants were asked about parents' occupation and number of years of schooling. We used Hollingshead's (1975) Four Factor Index of Social Status to compute each participant's family SES. An average of both parents' SES scores was used unless a participant came

from a single-parent family, in which case only the single parent's score was used. Higher scores indicate higher SES.

Hostility measure. We used the cynicism subscale of the Cook–Medley Hostility Scale (Barefoot, Dodge, Peterson, Dahlstrom, & Williams, 1989), which consists of 13 items rated as either true or false. Higher scores indicate higher hostility. This scale has good internal consistency ($\alpha = .81$; Woodall & Matthews, 1993).

Aggression measure. We used the Young Adult Self Report (an older version of the Child Behavior Checklist; Achenbach, 1997) aggression subscale, which consists of 12 items scored on a 3-point scale. Higher scores indicate higher aggression. This subscale also has good internal consistency ($\alpha = .84$; Achenbach, 1997).

Results

Phase II involved selecting the four best vignettes (out of the 10 selected in Phase I) for video production. We sought vignettes that would elicit a wide range of interpretations among adolescents. All five ambiguous vignettes produced the full range of threatening and positive interpretations (ranging from *not at all likely* to *very likely* on a 5-point scale) across the sample. Four out of the five negative vignettes produced the full range of interpretations.

Interpretations and Cynicism

To test convergent validity, we correlated interpretation scores with cynicism. We expected that threat interpretations during ambiguous situations would be positively associated with trait hostility. Among the ambiguous vignettes, more threat interpretations were significantly associated with greater cynicism for three out of five vignettes (r s for Vignettes 1, 2, and 5 ranged from .35 to .40, p s < .01). In contrast, none of the negative vignettes was significantly associated with cynicism (see Table 1).

Interpretations and Aggression

To test divergent validity, we correlated interpretation scores with aggression. We expected that threat interpretations during ambiguous situations would not be associated with aggression. Among the five ambiguous vignettes, we found no significant associations of interpretations with aggression scores. Among the five negative vignettes, we also found no significant associations of interpretations with aggression scores (see Table 1).

Emotional Reactions

As further evidence of validity, we tested the emotional responses the vignettes produced. We hypothesized that negative outcome situations would elicit feelings of anger (because an undesirable outcome has already happened), whereas ambiguous outcome situations would elicit feelings of threat (because the situation would elicit future worry over a not-yet-determined outcome). Paired-samples t tests on the means of each type of vignette revealed that the five negative vignettes ($M = 3.38$, $SD = 0.70$) produced more anger than the five ambiguous vignettes ($M = 2.29$, $SD = 0.83$), $t(54) = 12.44$, $p < .01$. In contrast, the ambiguous vignettes ($M = 2.58$, $SD = 0.67$) produced greater feelings of threat than the negative vignettes ($M = 2.32$, $SD = 0.56$), $t(54) = 3.95$, $p < .01$.

SES and Interpretations

According to our theory, we expected to see associations of SES with threat interpretations during ambiguous but not negative

Table 1
Correlations of Threat Interpretations With Socioeconomic Status (SES), Cynicism, and Aggression During Each Story

Story type	Correlations of threat interpretations		
	With family Holl. SES	With cynicism	With aggression
Ambiguous			
1	-.31**	.35***	.16
2	-.29**	.40***	.24
3	-.19	.15	.05
4	-.20	.13	.20
5	-.28	.37***	.20
Negative			
1	-.14	.16	-.09
2	-.20	.17	-.12
3	-.11	.10	.15
4	-.36***	.22	.09
5	.02	-.01	.06

Note. Holl. = Hollingshead (1975); Ambiguous 1 = Teacher describes cheating incident, then asks you to stay after class for an unknown reason. Ambiguous 2 = Shopping with a potentially suspicious salesperson and security guard nearby. Ambiguous 3 = Hanging out in a neighbor's yard, then having the neighbor approach with an uninterpretable look on his face. Ambiguous 4 = Hearing footsteps behind you as you are walking alone. Ambiguous 5 = Classmate tells you that a friend had his wallet stolen during class and wonders whether you know anything about it. Negative 1 = In class, students start teasing you; you finally push a student's books off his desk, teacher yells at only you. Negative 2 = You and your friends, talking loudly, approach a restaurant near closing time, when the manager stops you to say they are closed. Negative 3 = Walking out of department store with several other people, alarm goes off, security guard rushes up to you. Negative 4 = Playing basketball, leave your ball to get a drink, return to discover a group of kids using your ball. Negative 5 = Loan your Palm Pilot to a classmate, later discover a big scratch on it.
** $p < .05$. *** $p < .01$.

vignettes. Among the ambiguous vignettes, lower family SES was significantly associated with greater threat interpretations for the same three vignettes (r s for Vignettes 1, 2, and 5 ranged from $-.28$ to $-.31$, p s < .05). In contrast, no significant association of SES with interpretations was found for four out of the five negative vignettes (see Table 1).

Phase III

Method

Participants

Phase III involved testing the validity of the videos that were created on the basis of Phase I and Phase II. Participants were 40 college freshmen and sophomores, participating for course credit (22 women and 18 men; 30 Caucasian and 10 African American; mean age = 18.73 years).

Materials

*CAUSE videos.*¹ In Phase II, we found that Ambiguous Vignettes 1, 2, and 5 showed evidence for convergent and divergent validity and produced

¹ Videos are available at the cost of duplication of the videos. We request acknowledgement of this article from researchers who use the CAUSE videos. Please send requests to Pittsburgh Mind–Body Center, Karen Matthews, Director, Department of Psychiatry, University of Pittsburgh School of Medicine, 3811 O'Hara Street, Pittsburgh, Pennsylvania 15213.

significant associations between family SES and threat interpretations. Among the negative vignettes, two were eliminated: one because it did not produce a good range of interpretations and the other because it had unexpected associations with SES. (In hindsight, the latter vignette may have been perceived to be ambiguous by students. In Phase I, only 7 of 12 raters found this vignette to be negative, and the certainty rating for this vignette was barely above the preestablished threshold.) Thus, we retained Negative Vignettes 1, 2, and 3.

We then contracted to have two videos of each type (ambiguous and negative) created by a professional video director and writer. They first decided which vignettes would be most suitable for filming purposes (e.g., on the basis of shooting location). We settled on Ambiguous Vignettes 1 (teacher and cheating incident) and 2 (shopping) and Negative Vignettes 1 (teacher and behavior in class) and 2 (restaurant closed). Scripts were professionally written, actors were hired, and the video director oversaw video shooting and editing. (See Table 2 note for a description of the video stories.)

To avoid the possibility that participants could make interpretations based on beliefs about discrimination, the race of all primary characters within videos was the same but varied across videos (e.g., one ambiguous video included African American characters, and the other included Caucasian characters). Each video was slightly over 3 min in length. Instructions at the beginning of each video stated that participants should imagine themselves as the main character in the video and experience the situation in the video as if it were happening to them. After each video, participants were asked open-ended questions about their interpretations of the videos (e.g., "Why do you think the teacher has asked to speak with you?"). Responses were audiotaped and coded for attributions from these audiotapes, similar to our approach in an earlier article (Chen & Matthews, 2001). Interpretations were coded on a 5-point scale, ranging from *-2 very benign interpretation* to *2 very threatening interpretation*. Two coders rated all audiotapes. Coders were within one point of each other for 89% of the ratings ($r = .70$).

SES measure. We computed Hollingshead Index scores as in Phase II. We also included a measure of family assets (e.g., family income, number of bedrooms in the house if the family owns the house, and number of cars that the family owns). Asset variables were standardized and averaged to create one composite asset score.

Hostility and aggression measure. We used the same scales as in Phase II.

Procedure

Participants watched the four study videos, which were presented in a partially counterbalanced format (Latin square design). Participants were

then interviewed about their reactions to each video, and they were asked the SES questions and they completed the hostility and aggression questionnaires.

Results

Interpretations, Cynicism, and Aggression

Threat interpretations during the ambiguous videos were associated with greater cynicism (significantly in one case and marginally in the other). In contrast, interpretations during the negative videos were not significantly associated with cynicism (see Table 2). We also tested whether the correlation coefficients for the ambiguous videos differed significantly from those for the negative videos. To do this, we combined responses to the two videos and used Hotelling's t test for correlated coefficients. Given our directional hypothesis, we applied a one-tailed t test and found that the correlation coefficient for ambiguous videos was significantly stronger than the correlation coefficient for negative videos, $t(40) = 2.19, p < .03$. We found no significant associations of interpretations with aggression scores during ambiguous or negative videos (see Table 2).

SES and Interpretations

Both lower family Hollingshead (significantly) and fewer assets (marginally) were associated with making more threatening interpretations of the two ambiguous videos. In contrast, neither family Hollingshead nor assets were significantly associated with interpretations during the two negative videos (see Table 2). In addition, as described in the paragraph above, we tested the difference in the strength of the correlation coefficients using Hotelling's t test. The correlation coefficient for ambiguous videos was marginally stronger than the correlation coefficient for negative videos, $t(40) = 1.61, p < .06$.

General Discussion

The results above demonstrate the validity of the CAUSE videos. Convergent validity was found in that interpretations during the ambiguous videos were positively associated with a trait hostility measure, although these situational and trait measures were

Table 2
Correlations of Threat Interpretations With Socioeconomic Status, Cynicism, and Aggression During Cognitive Appraisal and Understanding of Social Events Video Stories

Story type	Correlations of threat interpretations			
	With family Holl. SES	With family assets	With cynicism	With aggression
Ambiguous				
1	-.37**	-.28*	.26*	-.19
2	-.32**	-.30*	.36**	.19
Negative				
1	.07	-.03	-.05	-.11
2	-.02	-.08	-.04	.20

Note. Holl. = Hollingshead (1975); Ambiguous 1 = Teacher describes cheating incident, then asks you to stay after class for an unknown reason ("Billy Gets His Grade"). Ambiguous 2 = Shopping with a potentially suspicious salesperson and security guard nearby ("Shopping"). Negative 1 = In class, students teasing you; you finally push a student's books off his desk, teacher yells at only you ("Caught in the Act"). Negative 2 = You and your friends, talking loudly, approach a restaurant near closing time, when the manager stops you to say they are closed ("Going Hungry").

* $p \leq .10$. ** $p < .05$.

not identical (r s ranged from .26 to .34). As evidence of divergent validity, we found that interpretations during the ambiguous videos were not related to an aggression measure.

For the negative videos, we found no association between interpretations and trait hostility, as we expected (both hostile and nonhostile individuals can interpret a negative situation in a negative way). Unlike Dodge and colleagues (Dodge, 1980; Dodge & Price, 1994; Dodge et al., 1990), we also found no associations between interpretations during negative videos and aggression. This may be because many of Dodge and colleagues' scenarios involved acts of physical threats, whereas ours involved psychological threats. This may also be because their studies typically tested children who are high in aggression, whereas our study sample was not selected for high levels of aggression. The lack of associations between negative videos and hostility provides evidence that the negative vignettes are distinct from the ambiguous vignettes.

Finally, we tested our hypothesized associations of SES with interpretations. We found that during ambiguous situations, lower SES was associated with greater threat interpretations. In contrast, SES was not associated with interpretations during negative videos. This pattern supports the theory that low-SES adolescents have a tendency to become vigilant for threat, such that they are more likely than high-SES adolescents to make threat interpretations when situations are ambiguous. These findings are also consistent with our previous study that used written hypothetical scenarios (Chen & Matthews, 2001).

In summary, the primary goal of this study was to develop and validate a video-based measure of cognitive appraisal. We fully acknowledge that there are limitations to this validation study that make the results preliminary; these include the small sample sizes, the use of a primarily Caucasian sample, and the use of a college student sample. These limitations restrict the range of SES and limit the generalizability of these results. We are currently undertaking a larger study of stress-related cardiovascular reactivity in a community sample of high school students from a wide range of SES, with equal numbers of African American and Caucasian students. This larger study should allow us to more definitively test our theory of SES, interpretations, and reactivity relationships.

These limitations notwithstanding, the present findings suggest that the CAUSE videos are a valid tool for measuring cognitive appraisal in adolescents. These videos would be useful to researchers interested in testing differences in appraisals when a stressful stimulus is held constant. These videos also would allow researchers to measure, in a controlled laboratory setting, both interpretations of and physiological reactivity to potentially stressful real-

life social situations. This approach could help researchers to better understand the role that psychological appraisals play in health (e.g., potentially explaining relationships between low SES and cardiovascular risk).

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