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Anger Feelings and Anger Expression as a Mediator of the Effects of Witnessing Family Violence on Anxiety and Depression in Japanese Adolescents

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The effects of anger feelings (rated by the State-Trait Anger Expression Inventory) and witnessing family violence on anxiety and depression (rated by the Hospital Anxiety and Depression Scale) were examined in 457 junior high school students. Anxiety and depression scores were correlated with frequencies of witnessing family violence. In a regression analysis, however, after controlling for the demographic variables and depression score, the anxiety score was predicted by State Anger, Anger-Out, and Anger-Control; the depression score was predicted, after controlling for the demographic and anxiety score, by State Anger, Anger-In positively, and by Anger-Out and Anger-Control negatively. Witnessing family violence failed to add significant contribution in predicting anxiety or depression. These results were generally supported by structural equation modeling. The effects of witnessing family violence on dysphoric mood may be mediated by anger feelings. The style of dysphoric mood may be predicted by the style of anger expression.

Keywords: anger; anger expression; anxiety; depression; witnessing family violence

T he interest of researchers in the effects of domestic violence on children's mental health has expanded from those by child abuse victimization to

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those by witnessing family violence (Coyne, Barrett, & Duffy, 2000; Graham-Bermann & Edelson, 2001; Holden, Geffner, & Jouriles, 1998). Reviewing the literature, Kolbo, Blakely, & Engleman (1996) concluded that the negative effects of children's witnessing domestic violence on their emotional and behavioral development are less equivocal, whereas effects on children's social, cognitive, and physical development are somewhat inconclusive. Ample evidence has shown that children witnessing family violence are more likely to score high in anxiety and depression. However, the relationship between witnessing family violence and dysphoric mood (anxiety or depression) is unclear. Kolbo et al. criticized research based on social learning or learned helplessness models as less convincing.

Although anxiety and depression are psychological responses when facing threats to an individual, they are thought to be mediated by anger (Danesh, 1977). Like fear, anger is a spontaneous response to the perception of the alert signal that danger to the individual is imminent. "Fight or flight" is a classical coping behavior of animals in response to a dangerous situation. When children are exposed to interadult anger and violence, anger is reported as one of the most common immediate psychological responses (Crockenberg, & Forgays, 1996; Cummings, Ballard, & El-Sheikh, 1991; Cummings, Ballard, El-Sheikh, & Lake, 1991; Cummings, Davies, & Simpson, 1994; Cummings, Simpson, & Wilson, 1993; El-Sheikh & Cheskes, 1995; El-Sheikh, Cummings, & Goetsch, 1989; Feerick & Haugaard, 1999; Grych & Fincham, 1993).

Of research interest is the mechanism by which the two types of mood—anxiety and depression—are generated when witnessing domestic violence. It is well known that these two mood states coexist (Stravrakaki & Vargo, 1986; Tyrer, 2001); statistically they share a substantial portion of variance. Hence, two-variate correlations between a predictor variable and either anxiety or depression may be spurious because of the confounding effect of the other type of mood state. Therefore, the effects of predictor variables should be examined after controlling for the effects of the other type of mood.

The purpose of the current study was to examine the effects of different types of anger feelings and expression on the mood state, those of witnessing family violence on the mood state, and the mediating effects of anger feelings and expression on the relationship between witnessing family violence and mood state. Our particular interest was in the differentiating effects of anger feelings and expression on the development of anxiety and depression.

Methods

Participants

All the students of a junior high school in a rural town of Chiba Prefecture, Japan, were asked to participate in a questionnaire survey of mental health. In July 2001, teachers distributed this questionnaire to each student in a classroom. Of the total of 494 students at this school, 457 (93%) responded. They were ages 12 to 15 years. There were 219 boys and 181 girls, with the sex of 57 of the participants unknown. The number of the first-grade (equivalent to the seventh grade in the United States) students was 134, the second grade (equivalent to the eighth grade in the United States) 152, and the third grade (equivalent to the ninth grade in the United States) 152 with the grade of 19 of the participants unknown.

The school's teachers' meeting and the school headmaster, that is equivalent to the Institutional Review Board, approved the study design prior to the survey.

Measures

Witnessing family violence. A single item was provided. It asks, "Did you ever see any violent conduct at home?" using a 5-point Likert-type rating scale ranging from *never* (1) to *always* (5) to assess frequency when it was worst.

State-Trait Anger Expression Inventory (STAXI). The STAXI (Spielberger, 1979) is a 44-item questionnaire designed to evaluate different types of experience and expression of anger. The STAXI has five scales. State Anger consists of 10 items that measure the intensity of anger feeling at the time of the investigation. Trait Anger consists of 10 items that measure individual differences in the disposition to experience anger. Anger-In consists of 8 items that measure the frequency with which anger feelings are held or suppressed. Anger-Out consists of 8 items that measure the frequency with which anger is expressed toward other people or objects in the environment. Anger-Control consists of 8 items that measure an individual's capacity to control the expression. The STAXI was translated into Japanese by Suzuki and Haruki (1994).

Hospital Anxiety and Depression Scale (HAD). The HAD (Zigmond & Snaith, 1983) is a 14-item questionnaire to measure anxiety (7 items) and depression (7 items) with a 4-point Likert-type rating scale. Higher scores

indicate greater degree of anxiety or depression. The HAD is designed to measure mood symptoms of individuals in a setting of liaison psychiatry. The HAD was translated by Kitamura (1993).

Statistical Analyses

The HAD anxiety and depression scores were correlated with age, grade, sex (male = 1, female = 2), the STAXI scales, and the frequency of witnessing family violence. As expected, the HAD anxiety and depression scores were substantially correlated ($r = .475$, $p < .000$), so each of the two HAD scores was regressed on the predictor variables. The demographic variables (age, grade, and sex) were first entered into the regression equation. The other HAD score was then entered followed by a set of STAXI scales. Finally, the frequency of witnessing family violence was entered. This sequence of independent variable entry was based on the assumption that the entry of the other type of mood score (e.g., depression) could control its confounding effects on the predictive power of the anger scores and witnessing family violence on the mood score in question (e.g., anxiety) and that if the anger feelings and expression could mediate the effects of witnessing family violence on the mood score, significance in the correlation between witnessing family violence and the mood score would be expected to disappear after controlling for the anger feelings and expression. Finally, we performed structural equation modeling to examine the fitness of the model that hypothesized the mediation of anger feelings and expression on the effects of witnessing family violence on dysphoric mood. For statistical analyses, SPSS 10.0 (SPSS, 1999a, 1999b) and AMOS 4.0 (SmallWaters, 1999) were used.

Results

In two-variate correlations, none of the demographic variables (age, grade, and sex) was significantly correlated with the STAXI scale scores or the frequency of witnessing family violence. The HAD anxiety and depression scores were significantly correlated with the STAXI State Anger, Trait Anger, Anger-In, and the frequency of witnessing family violence (Table 1). Moreover, the HAD anxiety score was significantly correlated with Anger-Out. The frequency of witnessing family violence was correlated significantly with State Anger ($r = .309$, $p < .001$), Trait Anger ($r = .163$, $p < .01$), Anger-In ($r = .141$, $p < 01$), and Anger-Out ($r = .248$, $p < .001$).

Table 1
Correlation of the HAD Anxiety and Depression Scores With
the Demographic Variables, the STAXI Scale Scores, and
the Frequency of Witnessing Family Violence

Predictor Variables	*M* (*SD*)	HAD Anxiety	HAD Depression
Age	13.7 (1.0)	0.081	0.061
Grade	2.3 (1.6)	–0.077	0.018
Sex (male 1; female 2)	2.4 (2.5)	–0.057	0.002
State Anger	17.1 (7.4)	0.503***	0.441***
Trait Anger	22.6 (6.6)	0.386***	0.195***
Anger-In	19.0 (4.5)	0.393***	0.238***
Anger-Out	17.8 (4.7)	0.314***	0.083
Anger-Control	19.9 (4.9)	0.120	–0.069
Witnessing domestic violence	2.0 (0.9)	0.239***	0.201***

Note: HAD = Hospital Anxiety and Depression Scale; STAXI = State-Trait Anger Expression Inventory.
***$p < .001$.

When the HAD anxiety score was regressed on the predictor variables, age and the HAD depression score could predict the HAD anxiety score significantly (Table 2). After controlling for the demographic and depression scores, the HAD anxiety score could be predicted significantly by State Anger, Anger-Out, and Anger-Control. The frequency of witnessing family violence lost its significance in predicting the HAD anxiety score.

When the HAD depression score was regressed on the predictor variables, none of the demographic variables was significant in predicting the HAD depression score; however, as expected, the HAD anxiety score was significant. Among the STAXI scale scores, State Anger and Anger-In predicted the HAD depression score significantly positively whereas Anger-Out and Anger-Control predicted the HAD depression score significantly negatively. As with the HAD anxiety score, the frequency of witnessing family violence lost its significance in prediction.

Finally, we conducted structural equation modeling based on a assumption that (a) HAD anxiety and depression score shared a portion of variance; (b) HAD anxiety and depression scored correlated with the age; (c) HAD anxiety and depression could be influenced by the anger expression styles, trait and state angers, and witnessing the domestic violence; (d) anger expression styles

Table 2
Regression Analysis of the HAD Anxiety Score on the Predictor Variables

Predictors	Regression 1 (Demographics Only)		Regression 2 (Demographics and Other Type of Mood)		Regression 3 (Demographics, Other Type of Mood, and STAXI)		Regression 4 (Demographics, Other Type of Mood, STAXI, and Perception of Threat)	
	β	R^2 Increase	β	R^2 Increase	β	R^2 increase	β	R^2 Increase
Step 1: demographics		.018		.018*		.018*		.018*
Age	.128*		.099*		.095*		.093*	
Grade	−.126*		−.119*		−.080		−.078	
Sex	.005		.001		−.015		−.016	
Step 2: other type of mood				.214***		.214***		.214***
HAD depression			.464***		.332***		.327***	
Step 3: STAXI						.150***		.150***
State Anger					.225***		.214***	
Trait Anger					.066		.071	
Anger-In					.094		.095	
Anger-Out					.122**		.112*	
Anger-Control					.100*		.099*	
Step 4: Perception of threat								.002
Witnessing domestic violence								.051

Note: HAD = Hospital Anxiety and Depression Scale; STAXI = State-Trait Anger Expression Inventory.
*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3
Regression Analysis of the HAD Depression Score on the Predictor Variables

Predictors	Regression 1 (Demographics Only)		Regression 2 (Demographics and Other Type of Mood)		Regression 3 (Demographics, Other Type of Mood, and STAXI)		Regression 4 (Demographics, Other Type of Mood, STAXI, and Perception of Threat)	
	β	R^2 Increase	β	R^2 Increase	β	R^2 increase	β	R^2 Increase
Step 1: demographics		.003		.003		.003		.003
Age	.064		.003		.018		.017	
Grade	−.015		.044		.023		.024	
Sex	.009		.007		.005		.004	
Step 2: other type of mood				.217***		.217***		.217***
HAD anxiety			.471***		.369***		.363***	
Step 3: STAXI						.094***		.094***
State Anger					.302***		.290***	
Trait Anger					−.093		−.087	
Anger-In					.138**		.139**	
Anger-Out					−.153**		−.163**	
Anger-Control					−.183***		−.182***	
Step 4: perception of threat								.003
Witnessing domestic violence							.056	

Note: HAD = Hospital Anxiety and Depression Scale; STAXI = State–Trait Anger Expression Inventory.
$**p < .01.$ $***p < .001.$

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Figure 1
Structural Equation Model
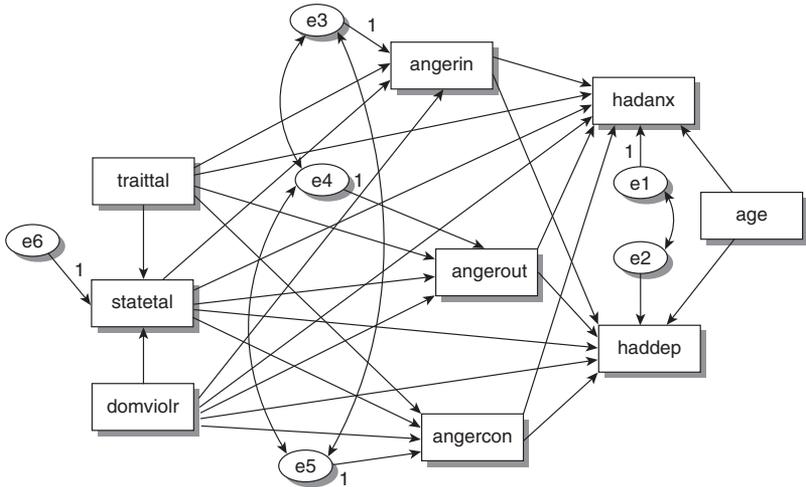
Note: traittal = total score of trait anger; statetal = total score of state anger; angerout = anger-out; angerin = anger-in; dom violr = witnessing domestic violence; angercon = anger control; HADanx = HAD anxiety score; HADdep = HAD depression score; age = age of student; e1 to e6 represent error variables to the corresponding variable.

were influenced by Trait and State Angers and witnessing the domestic violence; (e) State Anger was influenced by Trait Anger and witnessing the domestic violence; and (f) the anger expression styles covaried (Figure 1).

When the critical ratio of estimates did not reach a statistical significance ($p < .05$), we deleted them to finally obtain a model (Figure 2). This model fit the data well; goodness-of-fit index being .988, adjusted goodness-of-fit index being .957, and root mean square of approximation being .053. In this model, the age lost its significance in influencing the HAD anxiety or depression. The HAD anxiety was directly influenced by Anger-In, State Anger, and witnessing the domestic violence whereas the HAD depression was directly influenced by Anger-In, low Anger-Out, low Anger-Control, and State Anger. Both Anger-In and Anger-Out were influenced by Trait Anger whereas Anger-Control was not. Of the three anger expression styles only Anger-In was influenced by State Anger. State Anger was influenced by both Trait Anger and witnessing the domestic violence.

Figure 2
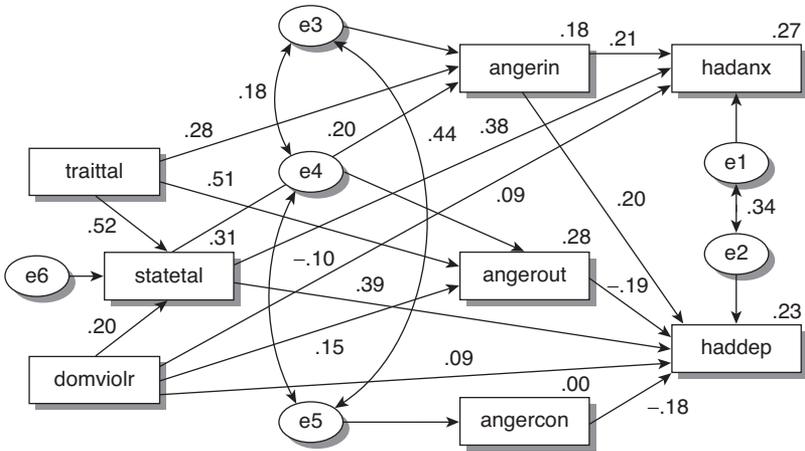
Note: traittal = total score of trait anger; statetal = total score of state anger; angerout = anger-out; angerin = anger-in; dom violr = witnessing domestic violence; angercon = anger control; HADanx = HAD anxiety score; HADdep = HAD depression score; age = age of student; HAD = Hospital Anxiety Scale; e1 to e6 represent error variables to the corresponding variables.

Discussion

The current study shows that although witnessing family violence is correlated with anxiety and depression, it loses its significance when controlling for the effects of anger feelings and expression. This supports the threat-anger-dysphoric mood model. When facing threatening scenes, children may react first with anger feelings and then dysphoric mood. Spielberger (1979) noted that anger was a more elementary concept than either hostility or aggression, although these three were often used interchangeably. Anger has a biological basis expressed by somatic symptoms including arousal of the autonomic nervous system. Regression analyses and structural equation modeling have shown that anxiety and depression can be predicted by State Anger but not by Trait Anger. The significant correlation between Trait Anger and anxiety and depression is spurious possibly because of a moderate correlation between State and Trait Angers ($r = .556$, $p < .001$). Trait Anger refers to an individual's readiness to perceive a wide range of situations as anger provoking and to respond to such situations with elevation of State Anger. In contrast,

State Anger refers to an individual's current emotional states consisting of subjective feelings of tension, annoyance, irritation, fury, and rage (Spielberger, 1979). In the current study, the frequency of witnessing family violence was moderately correlated with State Anger ($r = .309, p < .001$) but only slightly correlated with Trait Anger ($r = .136, p < .01$). It may be that witnessing family violence leads to elevation of State Anger and that this is more likely in students with elevated Trait Anger. This notion is supported by the structural equation modeling (Figure 2).

Although the two mood state scores were positively correlated with the State Anger score, they differed in their link to the anger expression. Thus, in the regression analyses anxiety can be predicted by high Anger-Out and Anger-Control; however, depression can be predicted by high Anger-In and low Anger-Out and Anger-Control. This suggests that students who outwardly can express their subjective feeling of a wide range of anger or those who can be resist becoming angry easily are more likely to be anxious when facing a threatening scene, whereas those students who hold or suppress anger but feel it inside (e.g., "I boil inside, but I don't show it"), who cannot express anger outwardly, or who are unable to control anger are more likely to be depressed when facing a threatening scene. Such a picture differs in the structural equation model slightly. The link of depression with the three anger expression styles was the same as in the regression analyses. However, the influence of Anger-Out and Anger-Control lost their significance in influencing the HAD anxiety score that was, on the other hand, influenced significantly by Anger-In. Thus, high Anger-In predicted anxiety and depression whereas low Anger-Out and low Anger-Control predicted the degree of depression in the structural equation model. The difference between the results of regression analyses and structural equation modeling is not easy to interpret. However, caution should be exercised for the interpretation of the path toward anxiety because the prediction capacity of Anger-Out and Anger-Control for anxiety was not as robust as that of these anger expression styles for depression in the regression analyses. We may speculate that increased anger leads to anxiety and depression and that expressing anger outwardly and controlling anger reduced the degree of depression.

Limitations of the current study should be considered before reaching a conclusion. The findings cannot be extrapolated into populations other than those in early adolescence. However, children in early adolescence may be likely to be influenced by witnessing family violence. Cummings, Ballard, and El-Sheikh (1991) reported that older adolescents were less likely to feel angry when facing interadult anger. They are also likely to have an onset of mood and anxiety disorders. Thus, the possible effects of witnessing family violence in those individuals are of clinical and research importance.

A drawback of the cross-sectional nature of the current study requires caution when interpreting the results. A possible model may be that anxiety and depression lead to anger feelings and expression, which facilitate the recall of family violence. Prospective follow-up studies are necessary to disentangle the causal relationships between witnessing family violence and anger, anxiety, and depression. Interpretation of our data should also be cautioned because the study population is Japanese only. Recognition of family violence such as child abuse is a recent phenomenon in Japan (Kitamura et al., 2000; Kitamura et al., 1995). The more stigmatizing the family violence the greater the impact it inflicts on the mental health of children who witness it. Scarcity of the related literature using a Japanese population makes it difficult to generalize our discussion. Detailed investigations on the influence of culture on the perception of the family violence are necessary. However, findings of the prevalence of child abuse (Kitamura et al., 2000) and its effects on the adolescent onset of mood and anxiety disorders (Yamamoto et al., 1999) in a Japanese population are very similar to those reported in Western countries suggest that the threat-anger-dysphoric mood model presented in this article may be worth being replicated in Western societies.

Another concern of the methodology of the current study is the fact that all the measures were reported by the students themselves. It is possible that those students with high anxiety or depression report their anger feeling more strongly. However, bidirectional relationships found in the current study between mood states and anger expression styles suggest that the findings are not entirely spurious. Future research should incorporate physiological measures of anger such as blood pressure and heart rate.

Finally, the current study used the frequency of witnessing family violence as a measure of the threat perception; however, there may be more factors that elicit the perception of threat. It is also known that family violence is often linked with child abuse (McGee, 2000). Future research should take into account the effects of abuse victimization and witnessing family violence.

In short, the current study suggests that witnessing family violence is linked to dysphoric moods of children. This may be mediated by the elevation of anger feelings, and types of dysphoric mood may be determined by the style of anger expression.

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