

# Facial Expressions of Emotion and Psychopathology in Adolescent Boys

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On the basis of the widespread belief that emotions underpin psychological adjustment, the authors tested 3 predicted relations between externalizing problems and anger, internalizing problems and fear and sadness, and the absence of externalizing problems and social-moral emotion (embarrassment). Seventy adolescent boys were classified into 1 of 4 comparison groups on the basis of teacher reports using a behavior problem checklist: internalizers, externalizers, mixed (both internalizers and externalizers), and nondisordered boys. The authors coded the facial expressions of emotion shown by the boys during a structured social interaction. Results supported the 3 hypotheses: (a) Externalizing adolescents showed increased facial expressions of anger, (b) on 1 measure internalizing adolescents showed increased facial expressions of fear, and (c) the absence of externalizing problems (or nondisordered classification) was related to increased displays of embarrassment. Discussion focused on the relations of these findings to hypotheses concerning the role of impulse control in antisocial behavior.

It is widely believed that emotions serve adaptive functions (e.g., Ekman, 1992; Izard, 1977; Lazarus, 1991). Each emotion motivates cognitive processes, physiological responses, and expressive behavior that help the individual respond adaptively to specific problems of survival, such as fleeing from danger, developing and maintaining close social bonds, and avoiding or apologizing for social and moral transgressions.

Emotions also figure prominently in psychological maladjustment. In certain cases, the absence of emotion contributes to psychological dysfunction: Schizophrenic individuals suffer from flat affect (Bleuler, 1911/1950) or the reduced outward expression of affect (Kring, Kerr, Smith, & Neale, 1993), and psychopathic individuals experience reduced punishment-related emotion (Hare, 1978; Newman, 1987). Certain pathologies are associated with extreme levels of emotion: Anxious people experience high levels of fear (Izard, 1972); antisocial children experience and act on inappropriate anger (Cole & Zahn-Waxler, 1992). The link between psychopathology and emotion, in fact, is so pervasive that 45% of the diagnoses listed in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed.; *DSM-III*; American Psychiatric Association, 1980) referred to abnormal emotional response of one kind or another (Thoits, 1985).

In the current study, we tested three hypotheses concerning the relations between facial expressions of emotion and adolescent psychopathology. First, we expected externalizing adolescents, who are prone to aggressive and delinquent behavior, to show more anger. Second, we expected internalizing adoles-

cents, who are prone to anxiety, depression, withdrawn behavior, and somatic complaints, to show more fear and sadness. Our final hypothesis pertained to embarrassment, which is believed to contribute to psychological adjustment by motivating people to avoid social-moral transgressions and to apologize for transgressions that have occurred (Miller & Leary, 1992). This reasoning led us to expect the nondisordered adolescents to show the most embarrassment and the externalizing adolescents to show the least embarrassment.

## Benefits to the Study of Discrete Facial Expressions

Facial expressions are a remarkable indicator of emotion. Facial expressions correlate with the self-reported experience of emotion (Ekman, Friesen, & Ancoli, 1980; Keltner, 1995) as well as with patterns of autonomic nervous system (Levenson, Ekman, & Friesen, 1990) and central nervous system activity (Davidson, Ekman, Saron, Senulius, & Friesen, 1990). The study of facial expression offers researchers a window into complex emotional processes as they unfold dynamically.

The specific benefits to the use of facial expression in studies of psychopathology and emotion are several. First, the study of facial expressions of emotion allows researchers to test very specific hypotheses regarding emotion and psychopathology. Whereas studies using standard autonomic nervous system measures, such as heart rate and skin conductance, for example, permit tests of global hypotheses concerning levels of arousal or the valence of emotion, studies relying on facial expression can test hypotheses related to the discrete emotions. This, in turn, allows researchers to differentiate closely related, often comorbid psychopathologies (in the current study, internalizing and externalizing problems).

Second, by studying facial expression, we avoid the problem of the considerable predictor-criterion overlap between self-report scales that measure psychopathology, personality, and emotion (see Tennenbaum, 1977; Watson & Clark, 1992). For

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example, the Internalizing cluster of the often used Child Behavior Checklist (Achenbach & Edelbrock, 1983; Achenbach, Howell, Quay, & Conners, 1991) contains items such as "is fearful, anxious." The Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988), a widely used self-report measure of emotion, includes items such as "I often feel anxious, worried." If one were to study the relationship between the Achenbach measure of internalization, or other pathology scales for that matter, and widely used self-report measures of emotion, one would expect positive correlations on purely semantic grounds. Facial expression, in contrast, occurs in a different medium than self-report and avoids the predictor-criterion overlap problem.

### Externalizing Problems and Anger

The evidence for the hypothesized relation between externalizing problems and anger is twofold. First, anger in part defines externalizing problems (e.g., in the Child Behavior Checklist) and emerges as an important component of conduct disorder in factor-analytic studies (Hinshaw, 1987). Empirical studies have also documented relations between anger and externalizing problems. The self-reported tendency to experience and express anger correlates with acting out behavior in a normal population (Finch & Rogers, 1984) and in children in psychiatric care (Finch & Eastman, 1983), and it was higher in externalizing than internalizing children (Mabe, Treiber, & Riley, 1992). Children who engage in antisocial behavior are rated by parents, teachers, and peers as more hostile and angry (Cole & Zahn-Waxler, 1992). Young men and women who rated themselves as prone to aggression were more likely to engage in a variety of delinquent behaviors (Krueger et al., 1994).

### Internalizing Problems and Fear and Sadness

The argument for a link between internalizing problems and fear and sadness is likewise both definitional and empirical. Most definitions of internalizing problems include symptoms of anxiety and depression, which are related to fear and sadness (e.g., Izard, 1972). Empirical studies also point to a link between internalizing problems and fear and sadness. Children clinically diagnosed with depression, one component of internalizing problems, report higher scores on self-report depression inventories, of which anxiety and sadness are components (Asarnow & Carlson, 1985; Kazdin, Colbus, & Rodgers, 1986). Measures of childhood depression in fifth graders were most strongly related to self-reports of sadness, and in the case of boys, to anger as well (Blumberg & Izard, 1985). Socially withdrawn children are often rated as sad, anxious, or depressed (Rubin, Hymel, Mills, & Rose-Krasnor, 1991). Of course, fear plays a defining role in anxiety disorders (e.g., Izard, 1972). These findings, then, point to the second hypothesis tested in the current investigation: Adolescent boys with internalizing problems will display a higher ratio of more intense facial expressions of fear and sadness than nondisordered and externalizing adolescent boys.

### Psychological Adjustment and the Social-Moral Emotions

Beginning at least with Freud, scholars have proposed that moral behavior, socialization, and adaptive assimilation into society are founded on the social-moral emotions, which include embarrassment, shame, and guilt (Lewis, 1993; Miller & Leary, 1992; Tangney, 1991). The social-moral emotions involve self-consciousness, taking other people's perspectives on one's own behavior, and comparing personal actions to standards of morality and conventionality. The social-moral emotions serve at least two vital functions. First, the experience of embarrassment, shame, and guilt, in response to past and anticipated events, motivates people to avoid social transgressions (R. H. Frank, 1988; Miller & Leary, 1992). Second, the display of social-moral emotions, in particular embarrassment, serves as an apology for committed transgressions, thus restoring social relations disturbed by the transgression (Castelfranchi & Poggi, 1990; Keltner, 1995; Semin & Manstead, 1982).

One prevalent hypothesis holds that the absence of the social-moral emotions predicts antisocial behavior (e.g., Cleckley, 1955; Hare, 1978). Externalizing problems are in part defined as the absence of guilt (Achenbach & Edelbrock, 1983). Empirical evidence supports this definition of externalizing problems. Low scores on guilt-proneness measures were negatively correlated with measures of antisocial behavior (Ruma, 1967) and drug use (Schill & Althoff, 1975) and positively correlated with measures of moral development (Ruma & Mosher, 1967). In synthesizing the literature on antisocial behavior and emotion, Kochanska (1993) proposed that the feeling of discomfort at having committed a transgression is one of two components of conscience that predict psychosocial adjustment.

Recent research that has identified the nonverbal displays of embarrassment, one of the social-moral emotions (Edelmann & Hampson, 1979; Keltner, 1995), has made it possible to test the hypothesized relation between facial displays of social-moral emotion and antisocial behavior. Our third hypothesis, which is based on the previous argument linking psychological adjustment to social-moral emotion, posited the following relationship: Symptomalogical adolescent boys, and especially externalizing adolescents, will show a lower ratio of less intense embarrassment than nondisordered adolescents.

### Present Investigation

To test the hypotheses outlined above, we examined the facial expressions of emotion shown by adolescent boys during an individually administered IQ test. The interactive IQ test was selected as the emotional situation because it (a) evokes different emotions, including those relevant to our hypotheses; (b) evokes individual variation in emotional response; and (c) is similar to a central socializing context of adolescents—educational performance and evaluation. Adolescents were categorized into one of four diagnostic categories (internalizer, externalizer, nondisordered, and mixed) according to their teachers' ratings on the Child Behavior Checklist (Achenbach & Edelbrock, 1983).

Table 1  
*Means on Teacher-Reported CBCL Externalizing and Internalizing Factor Scales  
 for Four Comparison Groups of Boys*

Scale from CBCL	Diagnostic group				<i>F</i> (3, 66)
	INTERN ( <i>n</i> = 9)	EXTERN ( <i>n</i> = 9)	MIXED ( <i>n</i> = 12)	NON-DIS ( <i>n</i> = 40)	
Externalization	18.76	40.69	45.17	2.83	146.95****
Internalization	17.35	5.52	22.11	2.01	106.20****

*Note.* CBCL = Child Behavior Checklist (Achenbach & Edelbrock, 1983). INTERN = internalizers; EXTERN = externalizers; NON-DIS = nondisordered.

\*\*\*\* *p* < .0001.

## Method

### Participants

The materials used in this study include teachers' ratings of behavior problems and videotapes of 12- and 13-year-old boys collected in 1990. These data are archived as part of the Pittsburgh Youth Study (PYS; for details about the study, see Loeber, Stouthamer-Loeber, Van Kammen, & Farrington, 1989).

The boys in the sample had been previously divided into four groups on the basis of their teachers' reports using the Achenbach Child Behavior Checklist (Krueger, Caspi, Moffitt, White, & Stouthamer-Loeber, in press). Checklist items comprise two factors corresponding to the dichotomy between "internalizing" and "externalizing" syndromes (Achenbach et al., 1991). The four groups constructed from teachers' ratings allowed comparison of boys who represented cases of "pure" externalizing problems, boys who represented cases of "pure" internalizing problems, boys who simultaneously exhibited features of both externalizing and internalizing problems (mixed), and boys who were deemed nondisordered.

Previous validation research has demonstrated that boys falling at or above the 80th percentile in the population on these measures of childhood behavior problems are likely to have difficulties severe enough to warrant referral for treatment (Achenbach et al., 1991). Hence, we used the 80th percentile from the population norm as a cutoff in determining psychopathology group membership. Boys who fell at or above the 80th percentile on the population distributions of teacher-reported externalizing scores and below the 80th percentile on the teacher-reported internalizing scores were deemed pure externalizers. Boys who fell at or above the 80th percentile on the teacher-reported internalizing scores and below the 80th percentile on the teacher-reported externalizing scores were deemed pure internalizers. Boys who fell at or above the 80th percentile on the teacher-reported externalizing scores and at or above the 80th percentile on the teacher-reported internalizing scores were deemed mixed cases. Boys who fell below the mean on both the teacher-reported externalizing scores and the teacher-reported internalizing scores were deemed relatively nondisordered. The high ratio of mixed cases found in our sample (see Table 1) is not unusual: Epidemiological surveys typically observe high levels of comorbidity between externalizing and internalizing problems (Anderson, Williams, McGee, & Silva, 1987; Bird, Gould, & Staghezza, 1993; Fergusson, Hornwood, & Lynskey, 1993).

From the original sample of 508 boys, we coded the behavior of all those boys who were classified into one of the four groups and whose facial behavior was codable. The videotapes collected in 1990 were not designed for the kind of coding carried out in the present study; for example, most boys were videotaped from the side or at too great a

distance to allow for the resolution necessary to code facial expression. Thus, we included in our study only those boys whose facial behavior was codable and who were classified into one of the four groups. This left 70 boys for the current study. The original sample was drawn in 1986 to represent the population distribution of risk factors for future violent crime among fourth-grade boys in the Pittsburgh public school system (girls were not sampled because physical violence was the target outcome for the longitudinal study). The 70 boys used for the present research did not differ from the remaining 438 participants on measures of race, IQ as measured by the Wechsler Intelligence Scale for Children—Revised (WISC-R; Wechsler, 1974), father's or mother's socioeconomic status (SES), or any behavior problem scale from the Child Behavior Checklist (all *ps* > .3). The four groups of participants' scores on the internalization and externalization scales are presented in Table 1, which shows that the classification procedure did yield distinct groups.

### Measures

**WISC-R.** The adolescents were administered an abbreviated version (Yudin, 1966) of the WISC-R. The WISC-R is a standardized test of intelligence consisting of a series of questions and puzzles presented by a trained examiner positioned across a table from an examinee. Each adolescent was videotaped while completing this test. The video camera was in plain view during the entire testing session and was positioned to record only the adolescent's behavior. The examiner was off-camera.

Of the different components of the WISC-R, we elected to code adolescents' facial behavior while taking one component known as the Information subtest. During the Information subtest adolescents attempted to provide answers to a series of questions ("How many days make a week?", "How far is it from New York to Los Angeles?", "What is a barometer?") asked by the tester. According to instructions, adolescents were probed by the tester when they offered ambiguous answers. This general information task elicited frequent emotion because adolescents succeeded and failed in front of an authority figure at a task relevant to their school performance. Furthermore, because adolescents were engaged in a face-to-face interaction, their facial behavior was clearly visible and unconstrained by other demands such as writing.

**Coding of facial behavior.** Adolescents' facial behavior was coded by Dacher Keltner, who was blind to the behavior problem scores of the adolescents. A version of the Facial Action Coding System (FACS; Ekman & Friesen, 1976, 1978) was used (EMFACS) to code adolescents' facial behavior. EMFACS concentrates on coding only the emotion-relevant facial muscle movements that have been derived from previous theory and research (reviewed in Ekman, 1984). Although EMFACS is not as laborious as FACS, approximately 1 hr was required to code each

Table 2  
*Characteristics of Facial Expressions of Emotion Shown During 2 Min of an IQ Test*

Emotion	Participants showing expression	Average frequency	Average intensity	Average duration (s)
Negative				
Anger	25	1.64	2.78	1.68
Fear	29	2.28	2.34	2.65
Sadness	27	2.52	2.38	2.47
Social-moral				
Embarrassment	45	2.07	4.08	2.71

*Note.* Mean intensity scores for all expressions equal the mean of the intensity codes of the relevant facial actions, except in the case of embarrassment, which is the sum of the markers of embarrassment (gaze down, smile, smile control, head movement, face touch).

adolescent's 2-min episode of behavior. In the current study, EMFACS criteria were used to code the facial expressions of anger, contempt, disgust, enjoyment (Duchenne smile), fear, sadness, and surprise (which was not observed), as well as smiles of amusement, defined as Duchenne smiles accompanied by audible laughter and an open mouth (Keltner, 1995; Ruch, 1993). Facial expressions of embarrassment were identified when the adolescent showed a controlled smile, gaze down, and head movement away and down (Keltner, 1995). Each facial muscle movement was scored on a 5-point scale (1 = *minimal intensity*; 3 = *moderate intensity*; 5 = *extreme intensity*). Intensity and duration scores for each category of facial expression were derived by finding the mean of the intensity and duration scores of the emotion-relevant facial actions.

*Reliability of measurement.* Dacher Keltner coded the behavior of all 70 adolescents. A second person, who had passed the FACS reliability test and was blind to the investigation's aims and hypotheses, coded five randomly selected adolescents. Intercoder reliability was evaluated by using a ratio in which the number of action units on which the two coders agreed was multiplied by two and then divided by the total number of action units scored by the two persons. This agreement ratio was calculated for each event observed by one or both coders. The mean ratio of agreement was .78.

## Results

Table 2 presents the frequency, intensity, and duration of the facial expressions that adolescents showed during the information portion of the WISC-R (Wechsler, 1974) test.

Table 2 shows that the adolescents displayed frequent negative emotion and embarrassment during the IQ test. Tests of the hypotheses focused on two measures of facial expression of each emotion. First, emotion-ratio scores were calculated by dividing the number of facial expressions of each emotion shown by the adolescent by the total number of facial expressions of emotion shown by that adolescent. The ratio scores estimate the extent to which each emotion constituted each adolescent's distribution of expressed emotions. The overall expression magnitude scores were based on the intensity and duration as well as the frequency of facial expressions of emotion. Both intensity and duration of facial expression of emotion predict self-reports of emotion (e.g., Ekman et al., 1980), and in combination, provide a more reliable assessment of facial expression than simple fre-

quency counts. Thus, for each category of emotion, magnitude composite scores were equal to the sum of the number, intensity, and duration z scores for that emotion. Table 3 presents the means for the ratio and z-score composite measures for each of the negative emotions relevant to our hypotheses.

Our hypotheses were tested with planned comparisons with weights that are represented in Table 4. For hypotheses relevant to anger, fear, and sadness, we used planned contrasts to test whether the "pure" groups (externalizers and internalizers) were different from the relevant comparison groups and then whether groups with a disorder (externalizers and mixed, internalizers and mixed) differed from the relevant comparison groups. For the hypotheses concerning embarrassment, we used planned contrasts to test whether nondisordered boys showed more embarrassment than the three groups and than the externalizing boys in particular.

## Externalizing Problems and Anger

Our first hypothesis predicted that adolescents with externalizing problems (both pure and mixed boys) would show more anger than both the nondisordered and the internalizing adolescents. On the anger ratio measure, analyses showed that "pure" externalizing adolescents showed an anger ratio score ( $M = .23$ ) more than three times higher than nondisordered adolescents ( $M = .07$ ),  $t(47) = 2.30$ ,  $p < .03$ . The comparison of the anger ratio scores of "pure" externalizing and mixed adolescents (overall  $M = .16$ ) and nondisordered adolescents ( $M = .06$ ) also approached significance,  $t(59) = 1.87$ ,  $p = .066$ . Analyses of the composite z-score measure found one marginally significant effect: "Pure" externalizing adolescents had larger anger z scores ( $M = 1.31$ ) than nondisordered adolescents ( $M = -0.41$ ),  $t(47) = 1.69$ ,  $p < .10$ .

Table 3  
*Distribution of Emotions Across Four Comparison Groups*

Emotion	Diagnostic group			
	INTERN ( <i>n</i> = 9)	EXTERN ( <i>n</i> = 9)	MIXED ( <i>n</i> = 12)	NON-DIS ( <i>n</i> = 40)
Negative				
Anger				
Ratio	0.10	0.23	0.11	0.07
z score	0.43	1.31	-0.41	0.05
Fear				
Ratio	0.15	0.05	0.05	0.17
z score	1.07	-1.35	-1.04	0.39
Sadness				
Ratio	0.10	0.04	0.17	0.15
z score	0.13	-0.57	0.12	0.06
Social-moral				
Embarrassment				
Ratio	0.14	0.16	0.08	0.22
z score	0.05	-0.63	-1.43	0.56

*Note.* INTERN = internalizers; EXTERN = externalizers; NON-DIS = nondisordered.

Table 4  
Contrast Weights Used in Planned Comparisons  
to Test Hypotheses

Emotion	Diagnostic group			
	INTERN ( <i>n</i> = 9)	EXTERN ( <i>n</i> = 9)	MIXED ( <i>n</i> = 12)	NON-DIS ( <i>n</i> = 40)
Anger	-1	1		
		1		-1
	-2	1	1	
Fear and sadness		1	1	-2
	1	-1		
	1			-1
Embarrassment	1	-2	1	
	1		1	-2
	-1	-1	-1	3
	-1			1
		-1	-1	2

Note. INTERN = internalizers; EXTERN = externalizers; NON-DIS = nondisordered.

### Internalizing Problems, Fear, and Sadness

Our second hypothesis predicted that adolescents with internalizing problems (both "pure" and mixed) would display more fear and sadness than both the nondisordered and externalizing adolescents. One contrast analyzing facial expressions of fear proved to be significant: "Pure" internalizing adolescents' fear *z* scores ( $M = 1.07$ ) were greater than those of externalizing adolescents ( $M = -1.35$ ),  $t(16) = 1.99$ ,  $p = .05$ . No differences were found in comparing the relevant groups' displays of sadness on either the ratio or *z*-score composite measures.

### Nondisordered Adolescents and Social-Moral Emotions

Our final hypothesis predicted a relation between the absence of social-moral emotion (embarrassment) and the presence of psychological disorder. The most general form of this hypothesis predicted that nondisordered adolescents would show more embarrassment than the other three groups. Consistent with our hypothesis, nondisordered adolescents' embarrassment ratio scores ( $M = .22$ ) were higher than those of the three disorder groups (overall  $M = .12$ ),  $t(68) = 2.20$ ,  $p < .05$ , as were their *z* scores ( $M = 0.56$  vs. overall  $M = -0.16$ ),  $t(68) = 1.95$ ,  $p = .054$ . Our more specific prediction was that adolescents with externalizing problems in particular would show less embarrassment than nondisordered adolescents. Consistent with this hypothesis, externalizing and mixed adolescents showed less embarrassment than nondisordered adolescents on both the ratio score (overall  $M = 0.11$  vs.  $0.22$ ),  $t(59) = 1.91$ ,  $p = .06$  and the *z* score (overall  $M = -1.09$  vs.  $0.56$ ),  $t(59) = 2.25$ ,  $p < .03$ .

### Correlations Between Achenbach Subscales and Facial Expressions of Emotion

In subsequent analyses, we examined the correlations between the two facial expression measures for each emotion and

the subscales of the measures of externalizing problems (Delinquent behavior and Aggressive behavior) and internalizing problems (Anxiety/Depression, Withdrawn, and Somatic Complaints). These correlations addressed two issues. First, we examined whether the across-subject correlations would replicate the findings from the between-group comparisons. Second, as a more focused test of the hypothesized relation between fear and sadness and internalizing problems, we examined the relations between the measures of fear and sadness and the most relevant internalization subscale (i.e., anxious-depressed).

The correlations in Table 5 both replicate and extend the findings observed in the previous analyses. Consistent with our first hypothesis, both the ratio and *z*-score measures of anger were significantly and positively correlated with teacher reports of delinquent ( $r_s = .39$  and  $.31$ ,  $p_s < .01$ ) and aggressive ( $r_{\text{ratio}} = .28$ ,  $p < .01$ ) behavior. The ratio and *z*-score measures of embarrassment, consistent with our hypothesis, were significantly and negatively correlated with teacher reports of aggressive behavior ( $r_s = -.22$  and  $-.29$ ,  $p < .01$  and  $p < .05$ , respectively).

Several correlations in Table 5 also pertain to other claims concerning psychopathology and emotion. First, the ratio and *z*-score measures of fear were negatively and significantly correlated with teacher reports of delinquent ( $r_{\text{ratio}} = -.20$ ,  $p < .05$ ) and aggressive behavior ( $r_s = -.25$  and  $-.27$ ,  $p_s < .05$ , respectively), consistent with the hypothesis that fear inhibits antisocial behavior (e.g., Hare, 1978; Newman, 1987). Second, the ratio and *z*-score measures of embarrassment were negatively and significantly correlated with teacher reports of anxiety-depression ( $r_{\text{ratio}} = -.20$ ,  $p < .05$ ) and withdrawn behavior ( $r_s = -.31$  and  $-.35$ ,  $p_s < .01$ ), suggesting that embarrassment reflects social approach (Castelfranchi & Poggi, 1990).

### Discussion

In the current study, we tested hypotheses concerning the relations between externalizing problems and anger, internalizing problems and fear and sadness, and the absence of externalizing problems and social-moral emotion (embarrassment). The discrete facial expressions of emotion shown by adolescents classified into one of four groups were coded during their participation in an interactive IQ test. The IQ test is an ideal situation for testing these hypotheses because it is fairly ambiguous, elicits individual variation in emotion, and is part of a central socializing context in which adolescents are evaluated.

Adolescents with externalizing problems (both pure and mixed) did show a higher ratio of anger expressions than nondisordered adolescents, a finding that provided partial support for the first hypothesis. Pure externalizing adolescents also showed anger expressions of greater magnitude (i.e., of greater duration and intensity) than nondisordered adolescents. Subsequent correlational analyses replicated and extended these findings, showing that adolescents who were reported by their teachers to be more prone to delinquent and aggressive behavior expressed a higher ratio of facial expressions of anger that were of greater magnitude.

The hypothesis that internalizing adolescents would show more fear and sadness received weaker support than the other hypotheses. On one measure, the overall magnitude of fear,

Table 5  
*Correlations Between Teacher-Reported Subscales of Achenbach Child Behavior Checklist (CBCL) and Facial Expressions of Emotion*

Emotion	CBCL subscale				
	Anxious-depressed	Withdrawn behavior	Somatic complaints	Delinquent behavior	Aggressive behavior
Anger					
Ratio	.10	.17	.20*	.39***	.28**
z score	.06	.10	.19	.31***	.19
Fear					
Ratio	-.08	-.06	-.08	-.20*	-.25**
z score	-.06	-.01	.00	-.20*	-.27**
Sadness					
Ratio	-.01	-.05	-.10	-.13	-.09
z score	.02	-.10	-.14	-.06	-.06
Embarr.					
Ratio	-.20*	-.31**	-.18	-.18	-.22*
z score	-.19	-.35***	-.13	-.16	-.29**

Note. Embarr. = embarrassment.

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$  (all  $ps$  are two-tailed).

“pure” internalizing adolescents did indeed show more fear than “pure” externalizing adolescents. Internalizing adolescents did not show more fear, however, than the nondisordered adolescents, and they did not show more sadness than the externalizing and nondisordered adolescents, as we had hypothesized they would.

The hypothesis that nondisordered adolescents would show more social-moral emotion (embarrassment) than adolescents with externalizing or internalizing problems was also supported. Nondisordered adolescents did show more embarrassment than the adolescents in the three pathology groups, especially compared to adolescents with externalizing problems. Correlations were also consistent with this hypothesis, demonstrating that adolescents who showed increased embarrassment during the IQ test were reported by their teachers as less prone to aggressive behavior.

These findings provide the first evidence for the claim that different adolescent disorders are manifest in distinct facial expressions of emotion. Furthermore, the current study documented links between adolescent psychopathology and emotional expression even though the measures of emotion and psychopathology came from two sources (the child’s teacher and the child) rather than one, and emotional responses were assessed in one brief situation.

The failure to observe consistent facial correlates of internalization has several possible explanations. It may be that emotional expression is not related to internalizing problems. Rather, disorders of anxiety and depression may best be defined by particular cognitive biases, beliefs, and phenomenologies that are not manifest in the face. Alternatively, it may be that the emotions underlying internalizing problems are not reliably displayed socially in the face, but rather are most poignant and pronounced in private, internal experience. Consistent with this claim, interrater agreement is usually weaker between reporters of children’s depression and anxiety than for other disorders (Achenbach, McConaughy, & Howell, 1987).

The nature of the experimental situation—the IQ test—may have shaped the pattern of results observed in the current study. First, of the three hypotheses tested in the current study, that concerning the relation between social-moral emotion and adolescent psychopathology may have received the most legitimate test. The conditions of the IQ test most clearly resemble the conditions that produce embarrassment: Students make several mistakes in front of an authority who closely scrutinizes their performance. Consistent with this observation, embarrassment was the most commonly observed emotion during the information subtest of the IQ. Had we studied adolescents in situations that are more evocative of sadness and fear, such as a social loss or a physical threat to safety, we might have observed relations between the facial expressions of these emotions and internalizing problems.

One must also exercise caution in generalizing broadly about the capacity (or, as the current findings suggest, incapacity) for externalizing adolescents to display the social-moral emotions. The current study only showed that externalizing adolescents did not show much embarrassment in a school-related context, which may reflect the unimportance of school to externalizing adolescents. No doubt this is a consequential finding when one considers the significance of school performance to socialization. Yet in other contexts, for example in status negotiations among peers or in more social contexts outside of the classroom, externalizing adolescents may show more embarrassment than during an IQ test.

### *Emotional Correlates of Impulse Control*

The current findings dovetail with recent conceptualizations of the relation between antisocial behavior and deficits in the ability to inhibit or control impulses (Block & Block, 1980; Moffitt, 1993). Across a variety of measures, externalizing adolescents who are prone to aggressive and delinquent behavior demonstrate the inability to inhibit impulses (e.g., White et al.,

1994). This inability to inhibit impulsive behavior may be the overarching construct that accounts for the emotional correlates of externalization that were observed in the current study.

First, adolescents with externalizing problems showed a higher ratio of anger than nondisordered adolescents. They were the least likely to inhibit this antisocial emotion while interacting with the adult examiner. Certainly, one norm of emotional expression is the inhibition and control of anger in front of authority figures. Externalizing adolescents were not inclined to follow this norm.

Second, adolescents who showed more fear were, according to their teachers, less inclined to engage in delinquent and aggressive behavior. Several theorists posit that fear is part of an inhibitory system that enables people to respond to punishment, internalize moral standards, and control antisocial impulses (Hare, 1978; Kochanska, 1993; Newman, 1987).

Finally, externalizing adolescents showed the least embarrassment, an emotion that reflects inhibitory processes. The origins of embarrassment are alleged to be in the inhibition of prohibited pleasure (Tomkins, 1984). Anticipated embarrassment inhibits antisocial behavior (R. H. Frank, 1988; Miller & Leary, 1992). Inhibited behavior is part and parcel of the characteristic facial expression of embarrassment, which includes the gaze aversion (which is thought to sever current social interaction) and the inhibited smile (Keltner, 1995). Construed in this way, the relative absence of embarrassment observed in externalizing adolescents may mark their disinclination to inhibit their emotions and actions according to social morals and conventions. In summary, the three emotional correlates of antisocial behavior observed in the current study—increased anger and decreased fear and embarrassment—may reflect a more general deficit in inhibiting impulses that characterizes individuals prone to antisocial behavior. Follow-up research should examine the relation between emotion and emotion regulation.

### *Social Display of Adolescent Psychopathology*

Because of the social nature of facial expression, we close by offering a few speculations regarding the potential social consequences of the tendencies to display certain emotions. Facial expressions convey information to others about the individual's emotion (Ekman, Sorenson, & Friesen, 1969; Izard, 1977), personality (M. Frank, Ekman, & Friesen, 1993; Keltner, 1995), and likely behavior (Ekman, 1993; Fridlund, 1992), which influences the inferences and actions of others. We believe that the responses that facial expressions evoke in others mediate the social relationships that externalizing, internalizing, and nondisordered adolescents develop. Certainly one can readily imagine the consequences of frequently displaying intense anger, a tendency observed in externalizing adolescents. Displays of anger, brief and fleeting as they may be, evoke negative emotions in others (Ohman, Dimberg, & Esteves, 1989). People's negative emotional responses to externalizers' frequent anger, in turn, are likely to contribute to the social rejection and hostile relations that define the lives of aggressive children and adults (e.g., Coie, Dodge, Terry, & Wright, 1991).

The appropriate display of social-moral emotions such as embarrassment, especially after social transgressions, is likely

to have equally profound social consequences. Displays of embarrassment elicit liking, sympathy, and social acceptance in others (Semin & Manstead, 1982). Displaying embarrassment, we would argue, stimulates and maintains the kinds of rewarding, secure social bonds that contribute to psychological adjustment. In the absence of expressing embarrassment, less sympathy, liking, and social acceptance are likely to be the responses of others, which may profoundly shape the course of adolescent psychopathology.

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