

Maternal Socialization of Positive Affect: The Impact of Invalidation on Adolescent Emotion Regulation and Depressive Symptomatology

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This study examined the relations among maternal socialization of positive affect (PA), adolescent emotion regulation (ER), and adolescent depressive symptoms. Two hundred early adolescents, 11–13 years old, provided self-reports of ER strategies and depressive symptomatology; their mothers provided self-reports of socialization responses to adolescent PA. One hundred and sixty-three mother–adolescent dyads participated in 2 interaction tasks. Adolescents whose mothers responded in an invalidating or “dampening” manner toward their PA displayed more emotionally dysregulated behaviors and reported using maladaptive ER strategies more frequently. Adolescents whose mothers dampened their PA more frequently during mother–adolescent interactions, and girls whose mothers reported invalidating their PA, reported more depressive symptoms. Adolescent use of maladaptive ER strategies mediated the association between maternal invalidation of PA and early adolescents’ concurrent depressive symptoms.

The ability to successfully regulate affective states is central to mental health, and indeed, it has been noted that emotion dysregulation figures prominently in mental illness (Gross & Munoz, 1995). This may be particularly true of depressive disorders, as they are characterized by deficits of positive affect (PA) and/or an excess of negative affect (NA; Gross & Levenson, 1997). Because depressive disorders involve dysfunction of both the major affective systems (i.e., both aversive and appetitive; P. M. Cole & Kaslow, 1988; Gross & Munoz, 1995), failures or abnormalities in emotion regulation (ER) processes are likely to play a particularly critical role in their etiology.

There is much debate in the field regarding the definition of ER (e.g., P. M. Cole, Martin, & Dennis, 2004), and some researchers assert that ER and emotion generation/reactivity are largely inseparable processes (Campos, Frankel, & Camras, 2004). In this article, we acknowledge the critical, and to some extent unresolved, points raised in this debate and hence conceptualize ER more broadly to incorporate processes of emotional reactivity and its effortful regulation. Specifically, ER refers to the internal and transactional processes through which individuals alter or maintain an affective state, often in the service of accomplishing

their prioritized, situation-specific goals (Diamond & Aspinwall, 2003; Gross, 1999). ER can occur at any level of the emotion process, at any time the emotion is activated, and can be evident before an emotion is manifested (Campos et al., 2004). Difficulties with altering an undesirable affective state or maintaining a desirable state will henceforth be referred to as “emotion dysregulation.” In particular, dysregulation of NA can involve an individual being (too) easily drawn into a negative affective state (when directly or indirectly provoked), becoming “stuck” in that undesired state (i.e., maintains the NA for longer than desired) and/or using strategies that are ineffective in altering the affect as desired. Likewise, PA dysregulation can involve less frequent PA (e.g., less easily drawn into that desirable state) and an inability to maintain one’s positive affective state for a longer duration.

For example, Tomarken and Keener (1998) predicted that depressed individuals should display longer maintenance (i.e., greater “temporal continuity”) of NA and poorer ability to maintain PA. Consistent with this prediction, depressed adolescents were found to maintain depressive affective states for a longer duration compared to their non-depressed peers during parent–adolescent interactions (Sheeber, Allen, Davis, & Sorensen, 2000). Relatedly, emerging evidence suggests that emotion dysregulation in at-risk or depressed individuals may be linked to deficits in the strategies they use to

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respond to negative emotional states (e.g., Garber, Braafladt, & Weiss, 1995; Garber, Braafladt, & Zeman, 1991). One implication of these findings is that a better understanding of how ER skills develop will be valuable for the design of targeted prevention and early intervention strategies for young people with ER difficulties and at risk for depression, especially given that adolescence constitutes a time of particular risk for the onset of depressive disorders (e.g., Kessler, Avenevoli, & Merikangas, 2001; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993).

Research indicates that the family caregiving environment plays a crucial role in children's development of ER skills (e.g., Cassidy, 1994; Field, 1994). It has been postulated that caregivers provide "scaffolding" for a child's emotional development (Astington, 1996; Southam-Gerow & Kendall, 2002), and individuals' relationships with their parents set a developmental context for their ER in adolescence and young adulthood (Morris, Silk, Steinberg, Myers, & Robinson, 2007). Evidence suggests that parental behaviors that are low in support and high in conflict are associated with adolescents' regulation of dysphoric affect and experience of depressive symptomatology (e.g., J. P. Allen, Hauser, Eickholt, Bell, & O'Connor, 1994; Sheeber, Hops, Alpert, Davis, & Andrews, 1997; Sheeber, Hops, Andrews, Alpert, & Davis, 1998). Indeed, the family remains a key influence in the child's ER (Sheeber et al., 2000) and mental health (e.g., Gottman, Katz, & Hooven, 1997; Ramsden & Hubbard, 2002) even during adolescence. As Calkins and Bell (1999) have argued, developmental shifts during the transition to adolescence set an important context for parental involvement in the regulation of emotions. To date, however, research on ER during the adolescent period has been largely neglected, particularly in youth at risk of depression (for exceptions, see Kobak, Cole, Ferenz-Gillies, Fleming, & Gamble, 1993; Sheeber et al., 2000; Silk, Steinberg, & Morris, 2003). Moreover, there is evidence that the family remains a vital source of support during adolescence and that family relations have a stronger association with adolescents' depressive symptomatology than peer relations (e.g., Barrera & Garrison-Jones, 1992; McFarlane, Bellissimo, & Norman, 1995). This study aims to examine the role of parental socialization (as one form of family processes) in the development of ER and depressive symptoms in early adolescence.

Parental Socialization of ER

Though the majority of research on emotion socialization has focused on very young children (e.g., P. M.

Cole & Kaslow, 1988; Fox, 1994; also see review by Keenan, 2000), preliminary evidence suggests that older children and adolescents may learn to regulate their emotional arousal through parents' responses to their emotional expressions or behavior (e.g., Eisenberg, Fabes, & Murphy, 1996; Eisenberg et al., 1999; Klimes-Dougan et al., 2007).

Research to date on parental responses to child NA indicates that parental socialization characterized by acceptance, coaching, and problem solving are positively associated with children's adaptive responses to NA and inversely associated with depressive symptomatology (Eisenberg et al., 1996; Garber & Dodge, 1991; Gottman, Katz, & Hooven, 1996). Nonetheless, parental socialization of children's PA, and its effect on adolescent emotional functioning and mental health, is still a largely neglected issue in this field. Moreover, research examining the role of parents in emotion socialization after early childhood, especially leading into the adolescence period, has also been scarce, despite this being a critical time for the onset of depression (Kessler et al., 2001).

The pertinence of examining the effects of parental socialization of PA (as distinct from NA) is directly and indirectly implicated by evidence from two fields of research. The first set of evidence comes from the broader parenting literature. Research with young children has demonstrated that parents who frequently discuss emotions (positive and negative), including explanation of the causes and consequences of emotions and reactions to children's expressed emotion, tend to have children with better emotional skills in early childhood (Denham & Kochanoff, 2002; Denham, Mitchell-Copeland, Strandberg, Auerbach, & Blair, 1997; Eisenberg & Fabes, 1994; Halberstadt, Crisp, & Eaton, 1999), which is in turn associated with better ER skills (Fredrickson, 1998; Southam-Gerow & Kendall, 2002). Moreover, parents' positive attentiveness toward their preschoolers' positive and negative affective displays was related to children's emotional and social competence (Denham et al., 1997). However, given the documented changes that occur in the dynamics of parent-child relationships as children approach adolescence (see review by Yap, Allen, & Sheeber, 2007), more research in older childhood and early adolescence is needed. Furthermore, for the purpose of delineating the direct influence of parents on *adolescent ER*, an examination of specific parenting behaviors in response to their adolescent child's behaviors may be more informative. Besides, specific parenting behaviors with adolescents may also be able to inform the focus of interventions for adolescent psychopathology more effectively.

The second set of evidence is presented in a recent review on the relevance of neural systems of PA to the understanding of child and adolescent depression (Forbes & Dahl, 2005). Citing neurobehavioral evidence, namely, in the neural substrates of reward processing, the Forbes and Dahl (2005) distinguish between PA and NA, cogently arguing for the importance of examining the role of PA in youth depression. In particular, the function and interrelation of neural circuits involved in reward processing, including the striatum, orbitofrontal cortex, and amygdala, have specific associations with behavioral manifestations and are indicative of the independence of PA from NA. An important implication of this is the need to examine how children's ability to regulate their positive affective system can be disrupted, and the role of parents (protective or otherwise) in this process.

Of note, although PA is by definition pleasant and desirable, it can be considered inappropriate and/or excessive in certain contexts, especially by parents toward their child. Whether this is due to social norms or expectations, or parental intolerance or poor ER (e.g., in parental depression), parents sometimes respond to child PA in an invalidating manner, by restricting (e.g., instructing child to quiet down), punishing (e.g., reprimand or angry response), or dampening (dysphoric or still-faced response) their child's PA expression. Children who receive such socialization responses to their PA over time may learn to suppress their PA (or at least its expression) and may fail to develop adaptive skills in regulating their PA (Denham et al., 1997). These in turn may contribute to anhedonic tendencies that are purportedly a unique feature of depressive disorders (Clark & Watson, 1991). The overall aim of this study was to investigate whether such invalidating parental socialization of PA is associated with early adolescents' ER and depressive symptoms and whether the socialization–depression association is mediated by adolescent ER.

The Current Study

The assessment design of the current study is multi-method and multisource for measures of parental socialization and adolescent ER, using self-reports as well as observational coding of behaviors during mother–adolescent interactions. We measured early adolescents' ER through the observation of their behaviors in addition to their self-report of ER strategies because observational methods have the potential to capture the dynamics of the ER process and thus contribute unique insights to the understanding of ER compared to methods that focus solely on self-reported ER strategies or affective measures. This study design permits a more comprehensive assessment because

each source or method not only provides unique information but also contributes unique error. For example, a sequential observational system permits the detection of microsocial behavioral patterns without the intrusion of perceptual biases inherent in self-report measures, whereas self-report measures provide input from individuals who have substantially greater access than observers to internal regulatory processes and behavior patterns as they occur across time and setting (Sheeber, Davis, Leve, Hops, & Tildesley, 2007). The specific hypotheses for this study were the following:

1. More invalidating (e.g., restrictive, punishing, or dampening) and fewer validating (e.g., encouraging expression) maternal socialization responses to child PA will be associated with higher levels of adolescent depressive symptomatology. Maternal socialization is indicated by maternal self-report and behavioral indices of mothers' responses to their child's PA during mother–adolescent interactions. Given the known associations between parental psychopathology and parenting behaviors (Leinonen, Solantaus, & Punamaki, 2003), maternal depressive and anxiety symptoms were controlled for in all analyses involving maternal socialization.
2. Early adolescents who receive more invalidation and less validation of their PA will display higher levels of emotional dysregulation. Adolescent emotion dysregulation is indicated by greater frequency, duration and reciprocity of negative affective behaviors and lower frequency and duration of positive affective behaviors. It is hypothesized that fewer positive affective behaviors will be reflective of anhedonic tendencies observed in depressed individuals, though this has not been tested empirically to date in adolescents using behavioral observational methodology. Adolescent emotion dysregulation is also indicated by more frequent use of maladaptive ER strategies (as assessed by self-report).
3. Adolescent emotion dysregulation is associated with more depressive symptoms.
4. The relationship between maternal socialization and adolescent depressive symptomatology is mediated by adolescent ER.

Method

Participants and Selection Procedure

Final-year primary school students across metropolitan Melbourne, Australia, were recruited through their schools to take part in the school screening

phase. Through this process, 2,280 students completed Early Adolescent Temperament Questionnaire-Revised (EATQ-R; Ellis & Rothbart, 2001) in the classroom. Given that the main aim of the screening procedure was to provide a risk-enriched sample for the more intensive assessment phase, the EATQ-R scores were used to select a sample that was representative of scores across the full range of the temperament dimensions. Selection was based on scores on Negative Emotionality (NEM) and Effortful Control (EC) dimensions, given their hypothesized role as risk factors for emotional and behavioral disorders. Accordingly, equal numbers of male and female students were selected from each of the following ranges of scores on each dimension: 0–1, 1–2, 2–2.5, and greater than 2.5 *SD* above and below the mean. As outlined in Figure 1, this produced a risk-enriched sample ($N = 414$) for the intensive assessment phase that shows a relatively even distribution across EC and NEM while maintaining the range of temperament scores evident in the larger sample.

The first part of the intensive assessment phase included a battery of questionnaires each for parents and early adolescents to complete. From the selected sample, 245 families consented to participate in this assessment, which occurred a mean of 9.91 months ($SD = 3.10$) after the school screening. At the time of intensive assessment, participating adolescents were 11–13 years old ($M = 12.46$, $SD = 0.43$), and parents' ages ranged from 29 to 57 years ($M = 42.56$, $SD = 5.19$). Although youths of this age range are in their "early adolescence," they are referred to as "adolescents" in this article for ease of expression. Analyses revealed no differences between adolescents who discontinued participation after the school screening phase and those who participated in the intensive phase (Part 1) on NEM, $t(407) = 0.16$, *ns*, or EC, $t(413) = -0.54$, *ns*. The groups also did not differ in gender, $\chi^2(1, N = 415) = 0.34$, *ns*, or socioeconomic classification, $t(405) = -1.00$, *ns*. Socioeconomic classification was based on an index of neighborhood social disadvantage (using participants' residential postal codes), which is calculated as a sum of 13 indicators, such as unemployment, income, criminal offenses, child abuse, and early school leaving (Vinson, 2004).

The 245 families were then invited to take part in the family assessment, and from this, 200 parent-adolescent dyads consented. However, one family completed only the Event-Planning Interaction (EPI), and two sets of data from other participants were not codable. This resulted in 198 sets of behavioral data on the EPI (163 mothers, 80 boys) and 197 (162 mothers, 79 boys) on the Problem-Solving Interaction (PSI).

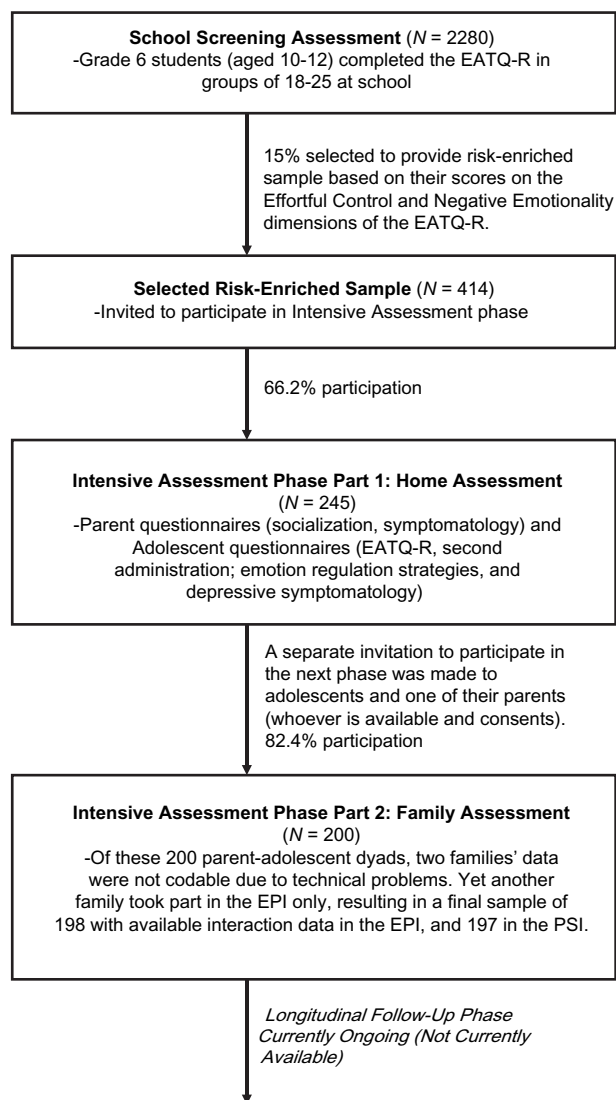


Figure 1. Sample selection process.

EATQ-R = Early Adolescent Temperament Questionnaire-Revised; EPI = Event-Planning Interaction; PSI = Problem-Solving Interaction.

Adolescents who declined to participate in the family assessment did not differ significantly from those who participated in NEM, $t(243) = 0.49$, *ns*; EC, $t(242) = -0.85$, *ns*; gender, $\chi^2(1, N = 245) = 0.15$, *ns*; or mother's country of birth (by continental regions), $\chi^2(7, N = 245) = 12.03$, *ns*. Of the 198 adolescents, 50% were female, and 92% self-identified as "Australian." This sample also did not differ from the original sample ($N = 2,280$) in gender, $\chi^2(1, N = 2,261) = 0.50$, *ns*; or socioeconomic classification, $t(2,241) = 1.55$, *ns*.

Given that the sample size of fathers is much smaller than that of mothers, and the exploration of differences in adolescent ER and symptomatology

according to parent gender is beyond the scope of this article, all analyses include only the subsample of families where *mothers* participated in the family assessment.

Procedure of Family Assessment Phase

Parents and adolescents participated in two 20-min family interactions, the EPI followed by the PSI (in that fixed order), which were videotaped for coding purposes. Separate cameras videotaped each participant. Order of interactions was fixed because we believed that it would be easier for participants to switch from a positive affective state (as elicited by the EPI) to a conflictual affective state (as elicited by the PSI), given that negative affective states are known to have slower decay rates than positive affective states (Gilboa, 1994). Topics for the EPI and PSI were identified based on participant responses to the Pleasant Events Checklist (PEC) and the Issues Checklist (IC), respectively. The PEC comprises 50 activities that people may enjoy doing, such as “taking a trip or vacation” and “snow skiing,” whereas the IC is a list of 44 topics about which adolescents and parents may disagree, such as “[adolescent] lying” and “[adolescent] talking back to parents.” Up to 5 activities that both parent and child indicated to be very pleasant in the PEC were chosen for parent–child dyads to plan for during the EPI, and up to 5 topics that were reportedly most conflictual (and recent) on the IC were chosen for the dyads to attempt to resolve during the PSI. As reported in a previous article on this data set (Yap, Allen, O’Shea, et al., 2007), participants displayed more PA in the EPI and more NA in the PSI, indicating a significant task effect. Participants were given \$50 cash (parents) and a \$30 voucher (adolescents) as reimbursement for their time and travel.

Measures

Parents’ Reaction to Children’s Positive Emotions Scale

The Parents’ Reaction to Children’s Positive Emotions Scale (PRCPS; Ladouceur, Reid, & Jacques, 2002) consists of a series of 12 vignettes in which children are likely to experience positive emotions such as joy, pride, excitement, and curiosity. Five of the 12 vignettes have been adapted from the original version (targeted for 4- to 8-year-olds) to be used with older school-age children. The new vignettes were adapted by following the same methodology used to create the original PRCPS for younger children—a committee of experts in developmental psychology and parents (Ladouceur et al., 2002). The PRCPS includes different

contexts (with peers or acquaintances, at a birthday party, in a car, etc.), but the parent is always present. Examples of the vignettes used are provided in Appendix A. For each situation, parents indicate on a 7-point scale (from 1 = *very unlikely* to 7 = *very likely*) how likely they would be to react as described in each of the six alternative responses. The PRCPS yields four subscales: Socialization ($\alpha = .65$), reflecting the degree to which parents explain to their child the reasons why their expressive behavior may be inappropriate given social norms or etiquette; Encouragement ($\alpha = .72$), indicating the degree to which parents encourage their child to express PA or validate their child’s positive emotional states; Reprimand ($\alpha = .77$), reflecting the degree to which parents react by reprimanding their child for expressing PA; and Discomfort ($\alpha = .75$), indicating the degree to which parents feel discomfort, embarrassed, or irritated when their child expresses PA. Test–retest reliability of these subscales with preschool children has been reported to range from .60 (Discomfort) to .79 (Reprimand). The convergent/divergent validity of the PRCPS has also been established by significant correlations between its subscales and the scales of other socialization and family environment questionnaires including the Coping with Children’s Negative Emotions Scale (Fabes, Eisenberg, & Bernzweig, 1990) and the Family Environment Questionnaire (Moos & Moos, 1981).

For the purpose of data reduction, correlational analyses were conducted to explore whether any of the scales can be collapsed to comprise composite constructs (Appendix A). Analyses revealed that Encouragement was negatively correlated with the other three scales ($r_s = -.27$ to $-.49$); therefore, it is termed *validating socialization*, reflecting nonrestrictive responses to child positive affective displays. The three remaining scales were positively correlated with one another ($r_s = .34$ to $.66$), reflecting parental discomfort and restrictive, dampening responses to child PA. The mean of these scales was calculated and used as an overall index of invalidating socialization of PA, which has a high internal consistency of $\alpha = .86$.

Child Affect Questionnaire–Child Strategies

The Child Affect Questionnaire–Child Strategies (Garber et al., 1995) was used to assess the frequency with which adolescents engaged in various responses for regulating NA in an interpersonal scenario. Adolescents were instructed to “imagine that you had just had a big fight with a good friend” and to indicate how often they would use each of the strategies after

the event, from 1 (*none of the time*), 2 (*a little of the time*), 3 (*about half of the time*), or 4 (*a lot of the time*). The strategies were grouped into six categories based on the existing literature concerning categories of affect regulation and coping strategies (e.g., Band & Weisz, 1988). However, only the Negative Responses scale was used in this study as a measure of "maladaptive ER" strategies, as this scale is conceptually and empirically indicative of poor ER (e.g., N. B. Allen, Sheeber, Leve, Davis, & Golston, 2003). The Negative Responses scale consisted of nine strategies, including "talk back to parents" and "continue to argue with the friend," and had a high Cronbach's alpha of .80. These strategies reflect deficits in managing the NA experienced in the given conflict scenario, resulting in inappropriate venting and dysregulated expressions of NA. Although almost 18% of adolescents reported using these strategies "none of the time," 71% of them reported using at least some of these strategies "a little of the time" ($M = 13.47$, $SD = 4.34$).

Center for Epidemiological Studies Depression Scale—Revised

Maternal and adolescent depressive symptomatology was measured using self-reports on the Center for Epidemiological Studies Depression Scale—Revised (CES-D—R; Radloff, 1977). The CES-D—R has been found to be valid and reliable for adults and adolescents, with Cronbach's alpha of .85 reported in both a general population sample of adults (Radloff, 1977) and a nonclinical sample of junior high school students (Radloff, 1991). Most of this adolescent sample reported few depressive symptoms ($M = 11.44$, $SD = 9.38$), with 59% having total scores of 0–10. Approximately 11% (14 male and 11 female) had total scores of 24 and above, suggesting that they have a relatively high likelihood of meeting criteria for major depressive disorder (Roberts, Lewinsohn, & Seeley, 1991). Many mothers also reported few depressive symptoms ($M = 10.37$, $SD = 10.09$), with 62% having total scores ≤ 10 , although 19% reported total scores exceeding the adult clinical cutoff of 16. Cronbach's alphas were .89 and .92 for adolescents and parents, respectively, in this study.

Beck's Anxiety Inventory

A state measure of maternal anxiety symptoms was obtained by maternal self-report on the Beck's Anxiety Inventory (BAI; Beck & Steer, 1990). The BAI has demonstrated good psychometric properties in a nonclinical college sample, showing a high internal consistency with Cronbach's alpha of .90, which is

comparable to that in this sample ($\alpha = .92$). Using the guidelines of Beck and Steer (1990) for score ranges, 70% of mothers reported a "normal" anxiety level, 23% mild to moderate, 3% moderate to severe, and 4% severe anxiety.

Family Observation Measure

The affect and verbal content of the videotaped interactions were coded in real time using the Living in Family Environments (LIFE; Hops, Davis, & Longoria, 1995) coding system. The LIFE is an event-based coding system in which new codes are entered each time the affect or verbal content of the interactants changes. The LIFE consists of 10 affect codes and 27 verbal content codes. Three composite variables, derived from the individual affect and content codes, were used in the current study (see Appendix B for the full list of codes and composition of constructs). *Aversive* behavior includes all codes with contemptuous, angry, and belligerent affect, as well as disapproving, threatening, or argumentative statements with neutral affect. *Dysphoric* behavior consists of all codes with dysphoric, anxious, or whining affect, as well as complaints and self-derogatory comments with neutral affect. A new Positive Interpersonal behavioral construct was developed for this study, consisting of statements made with happy, pleasant, and caring affect, as well as approving or affirming statements, and statements that serve to maintain the conversation. The validity of the former two constructs has been established in earlier studies examining parent–child interactions (e.g., Hops, Sherman, & Biglan, 1990; Sheeber et al., 2000). More detailed information about the development and psychometric characteristics of LIFE is presented in Hops et al. (1995).

All video recordings were coded by extensively trained observers who are blind to participant characteristics (e.g., temperament or symptomatology levels). Approximately 20% of the interactions were coded by a second observer to provide an estimate of observer agreement. Kappa scores in this study, which were in the good to excellent range (Fleiss, 1981), averaged .66 and .78 for content and affect codes, respectively, and kappa coefficients were .77, .68, and .89 for the Aversive, Dysphoric, and Positive Interpersonal composite codes, respectively. Random pairs of observers were assigned to the interactions to minimize drift between any two observers and to ensure that all observers met minimal criteria for acceptable observations. The base rate for coding an affect or content code was 1, which means that when it fails to occur at least once, it arises as a missing value

for that code for that particular participant. This results in variations in N for different constructs in different tasks.

On the basis of data obtained from the LIFE coding of family interactions, behavioral indices of maternal socialization and adolescent ER were derived. These include the following.

Rate per minute (rpm). The rpm variable indicates the number of times behaviors associated with a composite construct occurs per minute of interaction between participants. Separate variables were constructed to assess the average frequency of Aversive, Dysphoric, and Positive Interpersonal displays. More frequent aversive and dysphoric behaviors and less frequent positive interpersonal behaviors are taken as indicative of emotion dysregulation. The rpm variable has been more commonly used as a measure of positivity, negativity, and problem-solving capacity in family and parent-child interactions (e.g., Forgatch, 1989; Jacob & Johnson, 2001) and broadly reflects the emotional climate in these relationships. In this study, rpm is used as a broad measure of ER in that it indexes how easily one is drawn into a particular affective state (emotion generation/reactivity), as well as one's capacity in resisting the particular affective state (ER) and hence not produce it as often.

Sequential z score. The z scores for sequential relations indicate the extent to which a specified sequence of behavior occurs more or less often than would be expected as a function of the base rate of each behavior. The z scores represent whether a particular antecedent behavior is effective in eliciting/increasing the likelihood of (positive z score) or suppressing (negative z score) a particular consequent behavior (see Hops et al., 1995, for a more detailed description).

Specific behavioral sequences are of interest in this study as indicators of adolescent ER. In particular, greater reciprocity of aversive and dysphoric behaviors (e.g., positive z scores of adolescent aversive responses to maternal aversive behavior) is taken as indicative of emotion dysregulation. In creating these variables, antecedent behaviors are regarded as provocative affective stimuli. The extent to which the respondent reciprocates NA is therefore considered to be an index of the respondent's ability to regulate (e.g., diffuse) the affect generated by negative antecedent behaviors. This methodology is consistent with the manner in which difficulties in ER have been assessed in the context of both conflictual marital exchanges (e.g., Lindahl & Markman, 1990) and problem-solving interactions between adolescents (depressed and nondepressed groups) and their mothers (Sheeber et al., 2000).

Invalidating maternal socialization is indexed by a greater likelihood (i.e., more positive z scores) of "punishing" (aversive) and "dampening" (dysphoric) maternal responses following adolescent positive interpersonal behavior. Given that there has been minimal research on socialization of PA in adolescents, the punishing and dampening parental response variables were created as a conceptual parallel to maladaptive socialization of NA described in the theoretical and empirical literature (e.g., Eisenberg, Cumberland, & Spinrad, 1998; Eisenberg et al., 1996), which is characterized by punitive, dismissive parental responses to child affect.

Duration per episode (dpe). Dpe represents the average length of time that specific affective behaviors are maintained each time they are displayed during the course of each mother-adolescent interaction task. It is developed to capture the person's ability to shift out of negative affective states as well as to maintain positive states. Separate variables were constructed to assess the average duration of aversive, dysphoric, and positive interpersonal displays. A longer duration of aversive and dysphoric behaviors and a shorter duration of positive interpersonal behaviors are taken as indicative of emotion dysregulation.

To make analyses more methodologically stringent when using maternal behavior variables (as indices of maternal socialization) to predict adolescent behavior variables (as indices of adolescent ER), mother and child behavioral indices are derived from separate interaction tasks. In particular, given our interest in maternal socialization in the normal family environment, as a reflection of the type of parenting the child is usually exposed to, we examine maternal socialization during the nonconflictual, positive affective interaction context (EPI). Moreover, the EPI is more likely to evoke more PA from the adolescent, and it provides more opportunity to examine mothers' socialization responses to such. On the other hand, given our interest in adolescents' ability to regulate their emotions specifically in conflictual contexts (parent-child and/or peer), we examine adolescent ER during the PSI, which presumably poses challenges to the adolescents' ER capacity. In addition, adolescent ER in interpersonal conflictual contexts is also of interest because difficulties in interpersonal relationships have been associated with adolescent depression (Eisenberg et al., 1996, 1998). However, when predictor and outcome variables are derived from different methods (e.g., parent-report socialization or adolescent-report ER strategies with behavioral variables), behaviors in both tasks will be examined.

Results

Given the ample evidence from the developmental literature indicating adolescent gender differences in ER and depressive symptomatology (e.g., Hankin et al., 1998; Thayer, Rossy, Ruiz-Padial, & Johnsen, 2003) and in sensitivity to parental psychopathology and disturbances in parent–child interactions (e.g., Chaplin, Cole, & Zahn-Waxler, 2005; Klimes-Dougan et al., 2007), any moderating effects of gender on the associations between maternal socialization and adolescent outcomes are examined when testing the hypotheses of this study. Because few prior studies have investigated socialization and ER behaviors during parent–adolescent interaction tasks designed to elicit PA, behaviors in the EPI and PSI are examined separately to see if different forms of socialization and emotion dysregulation are evident in different parent–adolescent interaction contexts. All hypotheses were tested using hierarchical regressions, with statistical significance set at $\alpha = .05$. To test the first two hypotheses, adolescent gender was entered in Step 1, maternal depressive and anxiety symptoms in Step 2, maternal socialization in Step 3, and Socialization \times Gender interaction in Step 4. To test Hypothesis 3, analyses involved Steps 1, 3, and 4 given above and the predictor variable is adolescent ER. When testing the effect of adolescent ER (mediator) on symptomatology, maternal socialization (predictor) was controlled for as well.

Following the recommendation of Baron and Kenny (1986), the mediation model requires three criterion relationships, namely, (1) predictor (maternal socialization) variable exerts significant effects on mediator (adolescent ER), (2) outcome variable (depressive symptoms), and (3) mediator exerts significant effects on outcome variable. As such, where any of these three relationships was not significant in any model, mediation effects will not be tested. Although some scholars have more recently argued that Criterion (2) should not be required for mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), we chose to set these criteria because the conceptual model being tested in this study (Yap, Allen, & Sheeber, 2007) would only be meaningful if these relationships are significant. The significance of any mediation effect will be tested using the Sobel test (Aroian version; Preacher & Leonardelli, 2001), and indirect or mediated effects are calculated following the recommendations of MacKinnon and Warsi (1995). This calculation involves a two-stage regression procedure: First, the mediator (adolescent ER) is regressed on the predictor (maternal socialization). Second, adolescent symptomatology is regressed on

both predictor and mediator variables. The product of the regression coefficient of the predictor from the first regression with the coefficient of the mediator in the second regression yields the mediated effect of maternal socialization on adolescent symptomatology.

Adolescent gender had no significant main effects on their ER or depressive symptoms. Maternal symptomatology also had no main effect on adolescent symptomatology, but maternal depressive symptoms were positively associated with adolescent reciprocity of aversive behaviors during the PSI, $\beta = .22$, $t(155) = 2.00$, $p < .05$, $\Delta R^2 = .04$. All analyses are summarized in Tables 1 and 2.

Predicting Adolescent Depressive Symptomatology With Maternal Socialization

Regression analyses were first conducted to test the associations that adolescent depressive symptomatology has with mothers' socialization responses to adolescent PA. As predicted, maternal dampening of adolescent positive behaviors (i.e., a positive conditional probability for maternal dysphoric behavior given adolescent PA) during both interaction tasks was associated with more symptomatology. Adolescent gender moderated the association between maternal dampening in the EPI and adolescent symptoms, and follow-up analyses revealed that this association was significant for females but not for males, $\beta = .37$, $t(72) = 3.31$, $p < .005$, $\Delta R^2 = .13$. Gender moderation was also found for the association between maternal self-report of invalidating socialization and adolescent symptoms, with the association being significant for females only, $\beta = .32$, $t(75) = 2.97$, $p < .005$, $\Delta R^2 = .10$. Maternal punishing responses during mother–adolescent interactions and maternal report of validating socialization of PA were unrelated to adolescent depressive symptomatology.

Predicting Adolescent ER With Maternal Socialization

Consistent with expectations, adolescents whose mothers report being prohibitive of their PA displays (invalidating socialization) were more likely to reciprocate their mothers' aversive behaviors. Validating socialization was not directly associated with adolescent ER behaviors, but adolescent gender moderated some of these associations, which were significant for males but not for females. Male adolescents whose mothers report being more likely to encourage their positive affective displays demonstrated better ER during the PSI. These boys behaved aversively less often, $\beta = -.30$, $t(72) = -2.65$, $p < .01$, $\Delta R^2 = .08$; maintained their positive behaviors for a longer

Table 1

Summary of Hierarchical Regressions Predicting Adolescent Depressive Symptomatology With Maternal Socialization and Adolescent Emotion Regulation Variables

	N	B	SE B	β	ΔR ²
Maternal socialization responses to Ad positive affect					
Mo aversive given Ad positive (EPI)	148	0.36	0.63	.05	.00
Mo dysphoric given Ad positive (EPI)	150	2.49	0.85	.24 [†]	.06
Mo dysphoric Given Ad positive × Gender		-3.87	1.71	-.25*	.03
Mo aversive given Ad positive (PSI)	151	0.57	0.49	.10	.00
Mo dysphoric given Ad positive (PSI)	149	2.31	0.81	.23 [†]	.05
Mo self-report validating responses (PRCPS)	155	-0.07	0.07	.08	.00
Mo self-report invalidating responses (PRCPS)	155	0.15	0.09	.14	.02
Mo Self-Report Invalidating Responses × Gender		-0.50	0.18	-.31**	.05
Ad ER behaviors (PSI)					
Aversive reciprocity	151	0.51	0.24	.17**	.03
Aversive Reciprocity × Gender		-1.08	0.47	-.27	.03
Dysphoric reciprocity	149	0.49	0.56	.07	.01
Ad ER strategies (self-report)					
Maladaptive ER strategies	134	1.23	0.15	.57 ^{††}	.33

Notes. These values are based on models controlling for Ad gender (Step 1) and maternal symptomatology (Step 2; no significant main effects and thus not shown here), the above-mentioned variables in Step 3, and the interaction between gender and these variables in the final step (only significant interactions are shown here). The analyses using the frequency and duration of Ad behaviors in both tasks and Ad reciprocity in the EPI as predictors are nonsignificant and hence are not shown here (due to space constraints). A total of 21 regression analyses were conducted. ΔR² refers to change in R² values from Steps 2 to 3, except where interaction effects are shown, where the change is from Steps 3 to 4. Ad = adolescent; EPI = Event-Planning Interaction; ER = emotion regulation; Mo = mother; Positive = positive interpersonal; PRCPS = Parents' Reaction to Children's Positive Emotions Scale; PSI = Problem-Solving Interaction. *p < .05. **p < .01. †p < .005. ††p < .001.

duration, β = .30, t(72) = 2.65, p < .01, ΔR² = .09; and were less likely to reciprocate their mothers' aversive behaviors, β = -.30, t(72) = -2.82, p < .01, ΔR² = .09.

As predicted, adolescents whose mothers were more likely to punish their positive behaviors in the EPI displayed aversive behaviors more often in the PSI. Some gender effects were also found among these adolescents: Males maintained their aversive behaviors for a longer duration, β = .33, t(68) = 2.94, p < .005, ΔR² = .11, and females were more likely to reciprocate their mothers' dysphoric behaviors, β = .30, t(77) = 2.74, p < .01, ΔR² = .09. Maternal dampening of adolescent positive behaviors was unrelated to adolescent ER behaviors, and adolescent PA regulation was unrelated to all measures of invalidating maternal socialization.

Adolescents whose mothers reported more invalidating socialization reported using maladaptive ER strategies more frequently. This association was moderated by adolescent gender, and follow-up analyses revealed that it was significant for females only, β = .44, t(65) = 4.00, p < .001, ΔR² = .19. Adolescents whose mothers were more likely to dampen their positive behaviors during the PSI also reported using maladaptive ER strategies more often. Maternal punishing of adolescent positive behaviors was not associated with adolescent ER strategies.

Predicting Adolescent Depressive Symptomatology With Adolescent Emotion Dysregulation

Contrary to expectations, the frequency (rpm) and duration (dpe) of adolescent Aversive, Dysphoric, and Positive Interpersonal behaviors in both the EPI and the PSI were all not significantly associated with depressive symptomatology. However, adolescents with more depressive symptoms are more likely to reciprocate their mothers' aversive behavior in the PSI and their mothers' dysphoric behavior in the EPI. Moreover, adolescent gender moderated the former association, and follow-up analyses revealed that it was significant for females only, β = .33, t(74) = 3.01, p < .005, ΔR² = .11. More depressed adolescents also reported using maladaptive ER strategies more frequently when they experience NA.

Testing for Mediation

Following the recommendations of Baron and Kenny (1986), the only potential mediator to be tested here is maladaptive ER strategies, in the associations that maternal dampening behaviors in the PSI, and for females only, maternal report of invalidating socialization, have with adolescent depressive symptomatology because these are the only sets of associations that fulfill all three criteria.

Table 2
 Summary of Hierarchical Regressions Predicting Adolescent Emotion Regulation With Maternal Socialization Variables

DV: Ad ER	<i>N</i>	<i>B</i>	<i>SE B</i>	β	ΔR^2
IV: Mo aversive given Ad positive (EPI)					
Aversive frequency (rpm; PSI)	154	0.10	0.04	.22**	.05
Positive frequency (rpm; PSI)	154	0.05	0.05	.10	.01
Aversive duration (dpe; PSI)	154	0.07	0.68	.01	.00
Positive duration (dpe; PSI)	154	-0.27	0.20	-.11	.01
Aversive reciprocity (PSI)	154	0.40	0.20	.16	.02
Dysphoric reciprocity (PSI)	152	0.17	0.09	.15	.02
Dysphoric Reciprocity \times Gender		0.37	0.18	.23*	.03
Maladaptive ER strategies	133	0.05	0.32	.01	.00
IV: Mo aversive given Ad positive (PSI)					
Maladaptive ER strategies	136	0.32	0.25	.11	.01
IV: Mo dysphoric given Ad positive (PSI)					
Maladaptive ER strategies	134	1.28	0.38	.28 [†]	.08
IV: Mo self-report validating responses (PRCPS)					
Aversive frequency (rpm; PSI)	158	-0.00	0.00	-.06	.00
Aversive Frequency \times Gender		-0.03	0.01	-.33**	.05
Positive frequency (rpm; PSI)	158	-0.00	0.01	-.02	.00
Aversive duration (dpe; PSI)	158	-0.03	0.08	-.03	.00
Positive duration (dpe; PSI)	158	0.04	0.02	.12	.02
Positive duration \times Gender		0.12	0.05	.29*	.04
Aversive reciprocity (PSI)	158	-0.03	0.02	-.11	.01
Aversive Reciprocity \times Gender		-0.12	0.05	-.30*	.04
Maladaptive ER strategies	139	-0.00	0.04	-.00	.00
IV: Mo self-report invalidating responses (PRCPS)					
Aversive frequency (rpm; PSI)	158	0.01	0.01	.10	.01
Positive frequency (rpm; PSI)	158	0.00	0.01	.00	.00
Aversive duration (dpe; PSI)	158	0.07	0.10	.06	.00
Positive duration (dpe; PSI)	158	-0.05	0.03	-.14	.02
Aversive reciprocity (PSI)	158	0.07	0.03	.19*	.03
Maladaptive ER strategies	139	0.17	0.04	.31 ^{††}	.09
Maladaptive ER Strategies \times Gender		-0.22	0.09	-.27*	.04

Notes. These values are based on models controlling for Ad gender (Step 1; no significant main effects and thus not shown here) and maternal symptomatology (Step 2; only one significant main effect, described in text), the above-mentioned variables in Step 3, and the interaction between gender and these variables in Step 4 (only significant interactions are shown here). ΔR^2 refers to change in R^2 values from Steps 2–3, except where interaction effects are shown, where the change is from Steps 3 to 4. Because most analyses involving Ad dysphoric behaviors and maternal socialization in the EPI yielded nonsignificant findings, only those with significant results are shown. A total of 38 regression analyses were conducted. Ad = adolescent; dpe = duration per episode; DV = dependent variable; EPI = Event-Planning Interaction; ER = emotion regulation; IV = independent variable; Mo = mother; Positive = positive interpersonal; PRCPS = Parents' Reaction to Children's Positive Emotions Scale; PSI = Problem-Solving Interaction.

* $p < .05$. ** $p < .01$. [†] $p < .005$. ^{††} $p < .001$.

A series of hierarchical regressions revealed that maladaptive ER strategies accounted for unique variance in symptomatology even after each of the two above-mentioned predictors was entered into the regression model; therefore, the Sobel test was conducted to test for the significance of the mediation effects. As shown in Figure 2, the effects of both socialization variables on adolescent symptomatology became nonsignificant after accounting for the effects of adolescent ER strategies, indicating a significant mediation effect in both cases.

Discussion

On the whole, all four hypotheses were at least partially supported. Maternal dampening of adolescent positive affective behaviors, and in females only, maternal report of invalidating PA socialization, were associated with more adolescent depressive symptoms. Adolescents whose mothers were more likely to punish and dampen their positive affective behaviors during mother–adolescent interactions and to report using invalidating socialization of their PA expression demonstrated more emotion dysregulation.

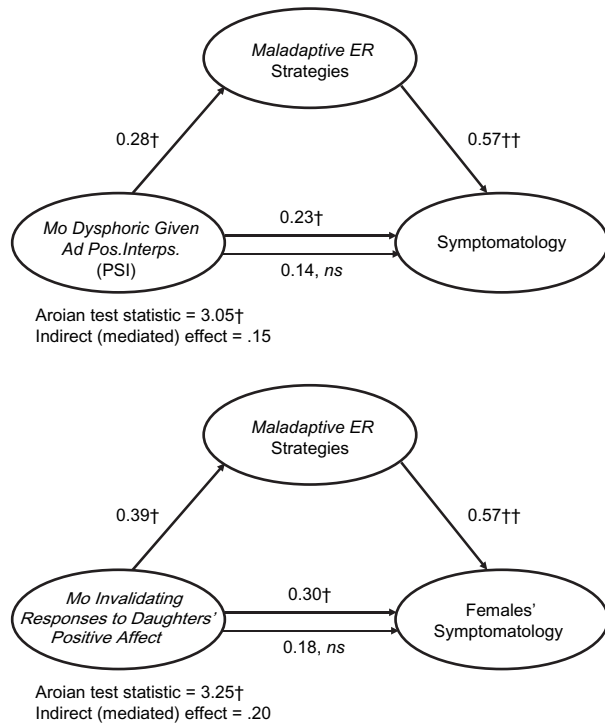


Figure 2. Diagram showing significant mediation of maladaptive ER strategies in the relationship between maternal dampening of Ad positive behavior during the PSI (top panel) and depressive symptomatology, and maternal self-report of Invalidating Socialization and symptomatology, females only (bottom panel). Note. Values shown are standardized regression coefficient (β) values. Ad = adolescent; ER = emotion regulation; Mo = mother; Pos. Interps = positive interpersonal; PSI = Problem-Solving Interaction. † $p < .005$. †† $p < .001$.

Moreover, adolescents with more dysregulated behaviors and who use maladaptive strategies more frequently to manage their NA reported more depressive symptoms. Adolescent ER strategies, but not behaviors, significantly mediated the association between maternal invalidation of PA and adolescent depressive symptomatology. Interestingly, validating socialization of PA was related to adolescent ER in males only and was not associated with adolescent depressive symptoms.

Maternal Socialization of PA and Adolescent Depressive Symptomatology

Findings from multimethod, multiinformant measures of maternal socialization partially supported the first hypothesis that invalidating maternal PA socialization predicts more adolescent self-reported depressive symptomatology. However, validating socialization was found to be unrelated to symptomatology. The finding that maternal dampening responses to adolescent positive affective

behaviors, as well as maternal report of invalidating PA socialization, are associated with elevated depressive symptomatology in early adolescents extends and replicates findings of recent, unpublished studies (Katz, 2002; Sheeber & Davis, 2002, as described and cited in Sheeber, Allen, Davis, & Katz, 2004). In particular, it is noteworthy that negative socialization of PA has implications for adolescent mental health.

Maternal dampening of adolescent positive behaviors seems to be an important form of maladaptive socialization that warrants further study because most studies of socialization have focused on punishing forms of parental socialization responses. The association between maternal dysphoric responses to their children's positive behaviors resembles those of depressed mothers (e.g., Hops et al., 1990; Jacob & Johnson, 1997); therefore, it may be argued that these mothers' tendency to dampen their adolescents' positive affective displays is related to the mothers' heightened symptomatology. However, our findings demonstrate that maternal socialization has effects on adolescent ER and depressive symptoms over and above any main effects of maternal symptomatology, which were minimal. Further post hoc analyses conducted to examine whether such maternal socialization responses are related to mothers' ER also revealed no significant associations. Therefore, it seems that mothers' likelihood to respond in a dysphoric manner to their adolescents' positive interpersonal behaviors has less to do with the mothers' own emotional functioning than it does with the interpersonal interaction context and the adolescents' emotional functioning.

Maternal invalidating socialization of adolescent PA (including maternal discomfort toward and tendency to use reprimanding or socializing emotion management strategies to decrease their child's expression of PA) was significantly associated with adolescent symptomatology, but only in females. Given that the effect of PA socialization on adolescent depressive symptomatology has not been studied before in past research, it is unclear why no significant effect was found in this study for males, and why maternal punishing behaviors were unrelated to adolescent symptoms as well. It is possible that such socialization behaviors contribute to adolescent depressive symptomatology indirectly via their impact on adolescent ER, namely, increasing the likelihood that these adolescents would reciprocate their mothers' aversive and dysphoric behaviors and use maladaptive ER strategies more often. Invalidating PA Socialization may also have an impact on boys that was not captured by the outcomes examined in this study, for example, on externalizing problems. Likewise, maternal punishing

socialization may contribute directly or indirectly to externalizing problems. Nonetheless, in the absence of the replication of these findings, it is difficult to draw firm conclusions.

Maternal Socialization of PA and Adolescent ER

On the whole, as predicted, more maternal invalidation and less validation of adolescent PA, as measured by multimethod, multisource methods, was found to be associated with poorer ER in the adolescent. The associations underscore the importance of investigating the previously neglected research area of the socialization of *positive* emotions for a better understanding of the effects of socialization on adolescent ER. Maternal responses that are restrictive and unaccepting of positive affective displays in their children (mother-report invalidating socialization) are associated with a greater likelihood of adolescents reciprocating their mothers' aversive behaviors in the PSI and more frequent use of ineffective ER strategies to manage NA elicited from a peer conflict situation. These findings are consistent with those of Denham et al. (1997), whereby parents' use of guiding and socializing language (similar to PRCPS Socialization and Reprimand scales) was negatively associated with preschool children's emotional and social competence, suggesting that parents may discourage affective displays of children who most actively need such tutelage (i.e., who are seemingly less able to self-regulate). Nonetheless, it is important to note that these cross-sectional associations may differ from longitudinal associations; hence, future research is warranted. Being more easily pulled into aversive exchanges with their mothers is a marker of poor ER for adolescents, given that it suggests an inability to downregulate their aversive affective reaction when provoked by maternal aversive behavior, in this case in a conflict resolution interaction with their mother. Indeed, these adolescents may have a tendency to use maladaptive strategies like venting and dysregulated expression of NA in such conflict situations, whether it is with their mother or their peers.

It is noteworthy that validating PA socialization was associated with better ER in males but not in females. Post hoc analyses revealed that this gender difference was not due to differences in mothers' likelihood to encourage PA expression in girls versus boys. Given the lack of past research into the role of PA validation in adolescent ER, or gender differences in this association, more research is required before further inferences can be drawn. Nonetheless, it is interesting that mothers' validation of their sons' PA is associated with male adolescents' regulation of

both positive and negative affective behaviors during a conflict resolution interaction with their mothers. This is broadly consistent with evidence that parental sharing of PA with young children is associated with children's social competence (Denham, 1997). If replicated, these findings have important implications for parenting interventions, suggesting that teaching parents to encourage their sons' PA expression may contribute to their sons' development of better ER.

This study used two behavioral measures of invalidating PA socialization that parallel the mother-report invalidating socialization measure, namely, maternal punishing (aversive) and dampening (dysphoric) responses to adolescent positive interpersonal behaviors. On the whole, the associations that these behavioral measures of socialization have with multimethod, multiinformant indices of adolescent ER are consistent with those involving questionnaire measures of socialization—maternal invalidation of adolescent positive affective displays engender risk for adolescent emotion dysregulation.

Adolescents whose mothers were more likely to respond aversively toward them when they displayed positive interpersonal behavior during the EPI (a context where such behaviors are normative and adaptive, thus making maternal punishing responses somewhat unjustified) displayed aversive behaviors more frequently during the PSI. Amongst these adolescents, males also maintained their aversive behaviors for a longer duration, whereas females were more likely to reciprocate their mothers' dysphoric behaviors. Maternal dampening of adolescent positive interpersonal behaviors was not related to adolescent ER *behaviors* but was associated with adolescents using maladaptive strategies more frequently to manage their NA.

In sum, findings from multimethod, multiinformant measures of maternal socialization of PA and adolescent ER paint a coherent picture consistent with past research involving NA and younger children (e.g., Denham et al., 1997) and with theoretical expectations involving PA. Maternal invalidation of adolescent PA comprises dysfunctional socialization in that they engender risk for adolescent dysregulation of both PA and NA. In particular, this study is among the first to investigate and demonstrate the effects of parental socialization of PA on adolescent ER.

Adolescent ER and Depressive Symptomatology

Adolescents with more depressive symptoms were more likely to reciprocate their mothers' aversive behaviors during the PSI and dysphoric behaviors during the EPI. Such individual differences in

aversive and dysphoric reciprocity during early adolescence may be indicators of risk for depressive disorders later in adolescence, arguably because such exchanges underlie poor ER in these early adolescents (Sheeber et al., 2000). In addition, adolescents who use maladaptive, dysregulated expressions and avoidance behaviors more frequently as strategies for regulating their negative emotions presented with elevated depressive symptoms. This latter finding is consistent with research on the ER strategies of adolescents and young adults (e.g., Gross & John, 2003; Silk et al., 2003).

Adolescent ER as a Mediator

Consistent with hypothesis, maternal dampening of adolescent PA predicted adolescent symptomatology through its effects on adolescent ER strategies but not on ER behaviors. This may be because self-report of strategies better reflects trait-like aspects of adolescent ER and is better placed to capture those aspects of adolescent functioning that are consistent over time and are therefore able to mediate the influence of parenting on symptoms. In females only, adolescent ER strategies also mediated the association between mother-report invalidating socialization and depressive symptoms. It is notable, moreover, that the effect of socialization on symptoms dropped to non-significance after adding the mediator to the model, suggesting that maladaptive ER strategies are a potent mediator in the association between maternal PA socialization and adolescent depressive symptomatology.

In particular, mothers who respond in an anxious or dysphoric manner (dampening) to their adolescent's positive interpersonal behaviors during the EPI may confer greater risk for depressive symptomatology in these adolescents because they use ineffective strategies more frequently to cope with their NA. The same applies for female adolescents whose mothers express discomfort, socialize, and/or reprimand them for expressing PA (invalidating socialization). In essence, such unjustified discouragement and dampening of their positive interpersonal behaviors may leave these adolescents frustrated and angry yet unable to successfully downregulate these emotions; hence, they experience a buildup of such emotions that can become pervasive and in turn lead to the elevation of depressive symptoms. Alternatively, when frustrated and angry, these adolescents may be less able to upregulate their PA to offset their NA or to diffuse the tension in the parent-adolescent relationship, which in turn contributes to their risk for developing more severe depressive problems.

Gender Differences

Some interesting gender differences emerged in this study, particularly in the associations between maternal PA socialization and adolescent ER and depressive symptoms. Overall, it appears that female adolescents' risk for depression is particularly sensitive to the effects of maternal invalidation of their PA. Researchers have suggested that this may be due to the intensity of the mother-daughter relationship in particular (Youniss & Ketterlinus, 1987) and due to increasing societal demands on them to maintain cordial interpersonal relationships (Davies & Windle, 1997). Notably, these findings suggest that this vulnerability may be evident from early adolescence. An implication of these findings is that parents should be cautious when responding to their daughters' PA even within apparent socialization norms, as such restrictive responses to girls' PA may have adverse effects on their emotional and psychological functioning. On the other hand, boys seem to benefit from maternal validation of their PA expressions, particularly in terms of their ability to regulate both their PA and NA. Hence, although boys are adversely affected by maternal invalidation, these findings suggest that maternal validation may serve as a protective factor for male early adolescents.

Strengths and Limitations

The current study has a number of notable strengths. It is based on a large population sample of adolescents, from which a smaller risk-enriched subsample was selected to represent a wide variance in temperament. Moreover, this study used a multimethod and multisource measure of ER, including a behavioral measure of adolescent ER and a self-report measure of ER strategies. This allowed the examination of multiple dimensions of emotions: valence (PA and NA), frequency, duration, and reciprocity, as recently recommended by researchers in the field (Gross & John, 2003; Larsen, 2000). Furthermore, this study addressed an important gap in the literature by examining the direct effects of maternal socialization of PA on ER and depressive symptoms in early adolescents. It also derived indices of maternal socialization and adolescent ER behaviors from separate interaction tasks and used multimethod and multisource measures of maternal socialization.

There were also limitations to this study. Only mothers were included in this study; hence, the potential differences in the effects of parental socialization due to parent gender could not be examined. The associations reported here are cross-sectional;

thus, findings from the longitudinal follow-up are required to clarify the direction of associations and to examine the possibility that ER mediates the association between parental socialization of PA and depression later in adolescence. In particular, longitudinal data are required to make more rigorous inferences about the causal relations implied in this mediational model (D. A. Cole & Maxwell, 2003). In addition, the risk-enriched sampling design of this study may have inflated effect sizes relative to a normal community sample.

Conclusions

Maternal socialization of adolescent PA has important implications for adolescents' ER strategies and their affective behaviors during mother-adolescent interactions, as well as their concurrent depressive symptoms. Adolescents with more depressive symptoms tend to use maladaptive ER strategies more frequently and display more emotion dysregulation during mother-adolescent interactions. Mothers' invalidation of adolescent PA and adolescents' emotionally dysregulated behaviors are likely to create and contribute to a family emotional climate that limits the adaptive development of ER skills in adolescents and heightens their risk for more severe depressive problems. These findings, albeit preliminary, highlight the importance of focusing on PA when working with parents of young adolescents at risk for depression. For example, parents should be made aware of the impact that preventing their children from experiencing or expressing PA can have on their children's development of ER and their risk for affective problems. It remains to be seen if adolescent ER behaviors would mediate the longitudinal association between their mothers' socialization behaviors and their diagnostic status, namely, of major depression, later in adolescence.

References

- Allen, J. P., Hauser, S. T., Eichholt, C., Bell, K. L., & O'Connor, T. G. (1994). Autonomy and relatedness in family interactions as predictors of expressions of negative adolescent affect. *Journal of Research on Adolescence, 4*, 535-552.
- Allen, N. B., Sheeber, L., Leve, C., Davis, B., & Golston, S. (2003). Autonomic cardiac control and family interactions: Adolescent affect and affect regulation [Abstract]. *Psychophysiology, 40*, S22.
- Astington, J. W. (1996). What is theoretical about the child's theory of mind? A Vygotskian view of its development. In P. Carruthers & P. Smith (Eds.), *Theories of theories of mind* (pp. 184-199). Cambridge: Cambridge University Press.
- Band, E. B., & Weisz, R. (1988). How to feel better when it feels bad: Children's perspectives with everyday stress. *Developmental Psychology, 24*, 247-253.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality & Social Psychology, 51*, 1173-1182.
- Barrera, M., & Garrison-Jones, C. (1992). Family and peer social support as specific correlates of adolescent depressive symptoms. *Journal of Abnormal Child Psychology, 20*, 1-16.
- Beck, A. T., & Steer, R. A. (1990). *Beck Anxiety Inventory manual*. San Antonio, TX: The Psychological Corporation Harcourt Brace Jovanovich.
- Calkins, S. D., & Bell, K. L. (1999). Developmental transitions as windows to parental socialization of emotion. *Psychological Inquiry, 10*, 368-372.
- Campos, J. J., Frankel, C. B., & Camras, L. (2004). On the nature of emotion regulation. *Child Development, 75*, 377-394.
- Cassidy, J. (1994). Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development, 59*, 228-283.
- Chaplin, T. M., Cole, P. M., & Zahn-Waxler, C. (2005). Parental socialization of emotion expression: Gender differences and relations to child adjustment. *Emotion, 5*(1), 80-88.
- Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology, 100*, 316-336.
- Cole, D. A., & Maxwell, S. E. (2003). Testing mediational models with longitudinal data: Questions and tips in the use of structural equation modeling. *Journal of Abnormal Psychology, 112*, 558-577.
- Cole, P. M., & Kaslow, N. J. (1988). Interactional and cognitive strategies for affect regulation: Developmental perspective on childhood depression. In L. B. Alloy (Ed.), *Cognitive processes in depression* (pp. 310-343). New York: Guilford.
- Cole, P. M., Martin, S. E., & Dennis, T. A. (2004). Emotion regulation as a scientific construct: Methodological challenges and directions for child development research. *Child Development, 75*, 317-333.
- Davies, P. T., & Windle, M. (1997). Gender-specific pathways between maternal depressive symptoms, family discord, and adolescent adjustment. *Developmental Psychology, 33*, 657-668.
- Denham, S. A. (1997). "When I have a bad dream, mommy holds me": Preschoolers' conceptions of emotions, parental socialisation, and emotional competence. *International Journal of Behavioral Development, 20*, 301-319.
- Denham, S. A., & Kochanoff, A. T. (2002). Parental contributions to preschoolers' understanding of emotion. *Marriage and Family Review, 34*, 311-343.

- Denham, S. A., Mitchell-Copeland, J., Strandberg, K., Auerbach, S., & Blair, K. (1997). Parental contributions to preschoolers' emotional competence: Direct and indirect effects. *Motivation and Emotion, 21*(1), 65–86.
- Diamond, L. M., & Aspinwall, L. G. (2003). Emotion regulation across the life span: An integrative perspective emphasizing self-regulation, positive affect, and dyadic processes. *Motivation and Emotion, 27*(2), 125–156.
- Eisenberg, N., Cumberland, A., & Spinrad, T. L. (1998). Parental socialization of emotion. *Psychological Inquiry, 9*, 241–273.
- Eisenberg, N., & Fabes, R. A. (1994). Mothers' reactions to children's negative emotions—Relations to children's temperament and anger behavior. *Merrill-Palmer Quarterly-Journal of Developmental Psychology, 40*, 138–156.
- Eisenberg, N., Fabes, R. A., & Murphy, B. C. (1996). Parents' reactions to children's negative emotions: Relations to children's social competence and comforting behavior. *Child Development, 67*, 2227–2247.
- Eisenberg, N., Fabes, R. A., Shepard, S. A., Guthrie, I. K., Murphy, B. C., & Reiser, M. (1999). Parental reactions to children's negative emotions: Longitudinal relations to quality of children's social functioning. *Child Development, 70*, 513–534.
- Ellis, L. K., & Rothbart, M. K. (2001). *Revision of the Early Adolescent Temperament Questionnaire*. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Minneapolis, MN.
- Fabes, R. A., Eisenberg, N., & Bernzweig, J. (1990). *The coping with Children's Negative Emotion Scale: Description and scoring*. Unpublished manuscript, Department of Resources and Human Development, Arizona State University, Tempe.
- Field, T. (1994). The effects of mother's physical and emotional unavailability on emotion regulation. *Monographs of the Society for Research in Child Development, 59* (2–3, Serial no. 240), 208–227.
- Fleiss, J. L. (1981). *Statistical methods for rates and proportions*. New York: Wiley.
- Forbes, E. E., & Dahl, R. E. (2005). Neural systems of positive affect: Relevance to understanding child and adolescent depression? *Development and Psychopathology, 17*, 827–850.
- Forgatch, M. S. (1989). Patterns and outcome in family problem-solving—The disrupting effect of negative emotion. *Journal of Marriage and the Family, 51*, 115–124.
- Fox, N. A. (1994). The development of emotion regulation. *Monographs of the Society for Research in Child Development, 59* (2–3, Serial no. 240).
- Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2*, 300–319.
- Garber, J., Braafladt, N., & Weiss, B. (1995). Affect regulation in depressed and nondepressed children and young adolescents. *Development & Psychopathology, 7*(1), 93–115.
- Garber, J., Braafladt, N., & Zeman, J. (1991). The regulation of sad affect: An information-processing perspective. In J. Garber & K. A. Dodge (Eds.), *The development of emotion regulation and dysregulation. Cambridge studies in social and emotional development* (pp. 208–240). New York: Cambridge University Press.
- Garber, J., & Dodge, K. A. (1991). *The development of emotion regulation and dysregulation*. New York: Cambridge University Press.
- Gilboa, E. (1994). Personality and the structure of affective responses. In S. H. M. van Goozen, N. E. Van de Poll, & J. A. Sergeant (Eds.), *Emotions: Essays on emotion theory*. Hillsdale, NJ: Lawrence Erlbaum.
- Gottman, J. M., Katz, L. F., & Hooven, C. (1996). Parental meta-emotion philosophy and the emotional life of families: Theoretical models and preliminary data. *Journal of Family Psychology, 10*, 243–268.
- Gottman, J. M., Katz, L. F., & Hooven, C. (1997). *Meta-emotion: How families communicate emotionally*. Mahwah, NJ: Lawrence Erlbaum.
- Gross, J. J. (1999). Emotion regulation: Past, present, future. *Cognition & Emotion, 13*, 551–573.
- Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality & Social Psychology, 85*, 348–362.
- Gross, J. J., & Levenson, R. W. (1997). Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology, 106*, 95–103.
- Gross, J. J., & Munoz, R. F. (1995). Emotion regulation and mental health. *Clinical Psychology: Science & Practice, 2*, 151–164.
- Halberstadt, A. G., Crisp, V. W., & Eaton, K. L. (1999). Family expressiveness: A retrospective and new directions for research. In P. Philippot, R. S. Feldman, & E. J. Coats (Eds.), *The social context of nonverbal behavior* (pp. 109–155). Cambridge, UK: Cambridge University Press.
- Hankin, B. L., Abramson, L. Y., Moffitt, T. E., Silva, P. A., McGee, R., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology, 107*, 128–140.
- Hops, H., Davis, B., & Longoria, N. (1995). Methodological issues in direct observation—Illustrations with the Living in Familial Environments (LIFE) coding system. *Journal of Clinical Child Psychology, 24*, 193–203.
- Hops, H., Sherman, L., & Biglan, A. (1990). Maternal depression, marital discord, and children's behavior: A developmental perspective. In G. R. Patterson (Ed.), *Depression and aggression in family interaction. Advances in family research* (pp. 185–208). Hillsdale, NJ: Lawrence Erlbaum.
- Jacob, T., & Johnson, S. L. (1997). Parent-child interaction among depressed fathers and mothers: Impact on child functioning. *Journal of Family Psychology, 11*, 391–409.
- Jacob, T., & Johnson, S. L. (2001). Sequential interactions in the parent-child communications of depressed fathers and depressed mothers. *Journal of Family Psychology, 15*, 38–52.

- Keenan, K. (2000). Emotion dysregulation as a risk factor for child psychopathology. *Clinical Psychology: Science & Practice, 7*, 418–434.
- Kessler, R. C., Avenevoli, S., & Merikangas, K. R. (2001). Mood disorders in children and adolescents: An epidemiologic perspective. *Biological Psychiatry, 49*, 1002–1014.
- Klimes-Dougan, B., Brand, A. E., Zahn-Waxler, C., Usher, B., Hastings, P. D., Kendziora, K., et al. (2007). Parental emotion socialization in adolescence: Differences in sex, age and problem status. *Social Development, 16*, 326–342.
- Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Fleming, W. S., & Gamble, W. (1993). Attachment and emotion regulation during mother-teen problem-solving: A control theory analysis. *Child Development, 64*, 231–245.
- Ladouceur, C., Reid, L., & Jacques, A. (2002). Construction and validation of the Parents' Reaction to Children's Positive Emotions Scale. *Canadian Journal of Behavioural Science, 31*, 8–18.
- Larsen, R. J. (2000). Toward a science of mood regulation. *Psychological Inquiry, 11*, 129–141.
- Leinonen, J. A., Solantaus, T. S., & Punamaki, R. L. (2003). Parental mental health and children's adjustment: The quality of marital interaction and parenting as mediating factors. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 44*, 227–241.
- Lewinsohn, P. M., Hops, H., Roberts, R. E., Seeley, J. R., & Andrews, J. A. (1993). Adolescent psychopathology 1: Prevalence and incidence of depression and other DSM-III-R disorders in high-school students. *Journal of Abnormal Psychology, 102*, 133–144.
- Lindahl, K. M., & Markman, H. J. (1990). Communication and negative affect regulation in the family. In E. A. Blechman (Ed.), *Emotions and the family: For better or for worse* (pp. 99–115). Hillsdale, NJ: Lawrence Erlbaum.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*, 83–104.
- MacKinnon, D. P., & Warsi, G. (1995). A simulation study of mediated effect measures. *Multivariate Behavioral Research, 30*, 41.
- McFarlane, A. H., Bellissimo, A., & Norman, G. R. (1995). Family structure, family functioning and adolescent well-being: The transcendent influence of parental style. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 36*, 847–864.
- Moos, R. H., & Moos, B. S. (1981). *Family Environment Scale and preliminary manual*. Palo Alto, CA: Consulting Psychologist Press.
- Morris, A. S., Silk, J. S., Steinberg, L., Myers, S. S., & Robinson, L. R. (2007). The role of the family context in the development of emotion regulation. *Social Development, 16*, 361–388.
- Preacher, K. J., & Leonardelli, G. J. (2001). Calculation for the Sobel test: An interactive calculation tool for mediation tests [Online software]. Retrieved February 2007 from <http://quantrm2.psy.ohio-state.edu/kris/sobel/sobel.htm>
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1*, 385–401.
- Radloff, L. S. (1991). The use of the Center for Epidemiologic Studies Depression Scale in adolescents and young adults. *Journal of Youth and Adolescence, 20*, 149–166.
- Ramsden, S. R., & Hubbard, J. A. (2002). Family expressiveness and parental emotion coaching: Their role in children's emotion regulation and aggression. *Journal of Abnormal Child Psychology, 30*, 657–667.
- Roberts, R. E., Lewinsohn, P. M., & Seeley, J. R. (1991). Screening for adolescent depression: A comparison of depression scales. *Journal of the American Academy of Child & Adolescent Psychiatry, 30*, 58–66.
- Sheeber, L., Allen, N., Davis, B., & Katz, L. F. (2004). *National Institute of Health grant application*. Unpublished manuscript.
- Sheeber, L., Allen, N., Davis, B., & Sorensen, E. (2000). Regulation of negative affect during mother-child problem-solving interactions: Adolescent depressive status and family processes. *Journal of Abnormal Child Psychology, 28*, 467–479.
- Sheeber, L., Davis, B., Leve, C., Hops, H., & Tildesley, E. (2007). Adolescents' relationships with their mothers and fathers: Associations with depressive disorder and subdiagnostic symptomatology. *Journal of Abnormal Psychology, 116*, 144–154.
- Sheeber, L., Hops, H., Alpert, A., Davis, B., & Andrews, J. (1997). Family support and conflict: Prospective relations to adolescent depression. *Journal of Abnormal Child Psychology, 25*, 333–344.
- Sheeber, L., Hops, H., Andrews, J., Alpert, T., & Davis, B. (1998). Interactional processes in families with depressed and non-depressed adolescents: Reinforcement of depressive behavior. *Behaviour Research and Therapy, 36*, 417–427.
- Silk, J. S., Steinberg, L., & Morris, A. S. (2003). Adolescents' emotion regulation in daily life: Links to depressive symptoms and problem behavior. *Child Development, 74*, 1869–1880.
- Southam-Gerow, M. A., & Kendall, P. C. (2002). Emotion regulation and understanding: Implications for child psychopathology and therapy. *Clinical Psychology Review, 22*, 189–222.
- Thayer, J. F., Rossy, L. A., Ruiz-Padial, E., & Johnsen, B. H. (2003). Gender differences in the relationship between emotional regulation and depressive symptoms. *Cognitive Therapy and Research, 27*, 349–364.
- Tomarken, A. J., & Keener, A. D. (1998). Frontal brain asymmetry and depression: A self-regulatory perspective. *Cognition & Emotion, 12*, 387–420.
- Vinson, T. (2004). *Community adversity and resilience: The distribution of social disadvantage in Victoria and NSW and the mediating role of social cohesion*. Richmond, Australia: Jesuit Social Services.
- Yap, M. B. H., Allen, N. B., O'Shea, M., Di Parsia, P., Simmons, J. G., & Sheeber, L. (2007). *Early adolescents'*

temperament, emotion regulation during mother-child interactions and depressive symptomatology. Manuscript submitted for publication.

- Yap, M. B. H., Allen, N. B., & Sheeber, L. (2007). Using an emotion regulation framework to understand the role of temperament and family processes in risk for adolescent depressive disorders. *Clinical Child & Family Psychology Review, 10*, 180–196.
- Youniss, J., & Ketterlinus, R. D. (1987). Communication and connectedness in mother- and father-adolescent relationships. *Journal of Youth & Adolescence, 16*, 265–280.

Appendix A: Parents’ Reaction to Children’s Positive Emotions Scale

Table A1
Intercorrelations Among Subscales of the Parents’ Reaction to Children’s Positive Emotions Scale

	Discomfort	Encouragement	Reprimand
Socialization	.38	-.25	.50
Discomfort		-.37	.65
Encouragement			-.46

Notes. N = 233, except the right-most column, where N = 232. All correlations are significant, *ps* < .001.

Examples of vignettes used (subscale are indicated in parentheses) are the following:

1. If we are sitting on the patio at our friends’ house and, while playing with other children, my child is running, jumping and screaming, I would:
 - (a) tell my child to calm down and suggest another game that he/she could play (Socialization)
 - (b) tell my child, in a firm voice, to stop jumping and running around immediately (Reprimand)
 - (c) let my child play and have fun (Encouragement)
 - (d) be slightly embarrassed by my child’s behavior (Discomfort).

2. If we are going on a family car-trip and, during the two-hour drive, my child and his/her friend are singing and laughing loudly, I would:
 - (a) feel annoyed by my child’s behavior (Discomfort)
 - (b) allow my child to have fun with his/her friend (Encouragement)
 - (c) firmly tell my child to stop it right now (Reprimand)
 - (d) suggest a quiet game for them to play (Socialization).

Appendix B: Components of Living in Family Environments Constructs

Content codes	Meaning	Affect codes	Meaning
10	Validation	0	Contempt
14	Affection	1	Anger
15	Solicitous	2	Anxious
16	Humor	3	Dysphoric
18	Approve	4	Pleasant
21	Complaint	5	Neutral
23	Cruelty	6	Happy
24	Negative substance	7	Caring
25	Provoke	8	Whine
26	Annoy – disrupt	9	Belligerence
28	Disagree		
30	Command		
31	Command unaccountable		
35	Comply		
37	Noncomply		
46	Self-statement		
47	Self-positive		
48	Self-complaint		
61	Problem statement		
64	Propose solution		
65	Teach		
66	Guidance tactic		
76	Attend		
78	Talk		
81	Inaudible		
98	Dummy		

Notes. Aversive construct = Affect codes 0, 1, or 9+ any content code or Affect code 5+ content codes 23, 25, or 26. Dysphoric construct = Affect codes 2, 3, or 8+ any content code or Affect code 5+ content codes 21 or 48. Positive Interpersonal construct = Affect codes 4, 6, or 7+ any content code or Affect code 5+ content codes 10, 14, 16, 18, or 47.