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Effects of children's temperament on mothers' and caregivers' supportive reactions related to socialization of emotion regulation

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- Mothers
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Abstract

Emotion regulation in children is associated with various aspects of developmental outcomes. In recent decades, researchers have paid considerable attention to its socialization to identify the manner in which children's emotion regulation may be facilitated by interaction with adults. Supportive reaction to children's negative emotions has been found to play a crucial role in enabling children's emotion regulation. Knowledge of the precursors of adults' supportive reactions can help control or direct their supportive reactions in a more efficient and productive manner. We conducted this study to examine the effects of young children's temperament on primary caregivers' supportive reactions to the children's negative emotions. In the first year of study (children's mean age = 11.8 months, SD = 3.58, n=191), both the mothers and the children's day-time caregivers completed a shortened version of the Infant Behavior Questionnaire to assess child temperament on three broad dispositional characteristics (i.e., effortful control, negative affectivity, and surgency/extraversion). One year later, both primary caregivers completed questionnaires about emotion- and problem-focused supportive reactions that they provided to their children's negative emotions. Our results indicated that child temperament predicted certain supportive reactions of both primary caregivers. Effortful control predisposition in the children predicted both mothers' and day-time caregivers' emotion- and problem-focused supportive reactions. Child negative affectivity predicted lower problem-focused support of day-time caregivers, but not of mothers. Child surgency did not predict either mothers' or caregivers' supportive reactions. Taken together, results of this study showed that infants' temperament could predict caregivers' behaviors in socialization of emotion regulation.

Abbreviations: EC: Effortful control; **NA:** Negative affectivity

INTRODUCTION

In recent decades, in order to identify the manner in which emotion regulation may be facilitated, researchers have paid considerable attention to the socialization between caregivers or parents with young children [1-4] on the ground that regulating one's emotions and behavior is critical for success in school, work, and life [5-7]. However, the spectrum of the variants relevant to emotion regulation in young children has been under researched.

Emotion regulation of young children includes extrinsic processes, which can involve adults' help with emotion reactivity and control [8]. In early childhood, socialization of emotion regulation from parents and other primary caregivers is one of the most critical external factors that influences young children [9]. In fact, reaction of primary caregivers to young children's emotions plays roles in one of the major mechanisms of emotion regulation socialization. Young children's emotions, either intense or frequent, often function to elicit reaction from their adult social partners [10-12]. Past research has already described how children's shift from external to internal sources of control over time [13,14] in that the external support provided to the children plays a key role in how they learn to internally regulate their emotions. To sum up, supportive reactions of primary caregivers play a crucial role in providing scaffolding that enables young children's regulation of emotions [15].

Children's attempts to constructively regulate their negative emotions could be facilitated by adults' supportive reactions [10,11,16]. There are two main approaches that adults use while providing support for emotion-evoked children—emotion-focused and problem-focused supportive reactions. While the first approach is rooted in emotions, the second is rooted in cognition. Emotion-focused supportive reaction refers to comforting/soothing behaviors that intend to help the child feel better [10]. Common types of comforting/soothing include hugging, rocking, patting, holding, singing, and talking soothingly [17]. If the comforting/soothing behavior is a response when children see an adult comforting their negative emotions, they may learn to use these same strategies to comfort themselves in the future. Problem-focused supportive reactions, on the other hand, include occasions when primary caregivers attempt to use cognitive regulation to reframe or reinterpret the salient features of an event that initially elicited negative emotion, in a

more neutral or positive manner to help the child to cope with the problem that causes the distress [18], e.g. the adults may use cognitive regulation strategies by suggesting how the child might re-interpret key parameters of the situation (e.g., "Those dogs are barking at the cats next door to their house, not at you."). In addition, once responses of the primary caregivers are taken into account, young children use social referencing to gain meaning about the emotional significance of events, which will allow them to begin to reinterpret negative emotional situations on their own [19,20].

A parent or caregiver may rely primarily on one of the supportive reactions, but the literature implies that optimal responses to children's emotions involve both emotion-focused support (e.g., a warm acceptance of a child's emotions) and problem-focused support (e.g., guidance in how to manage emotions). An emotion-focused supportive reaction may manage the emotion-evoking situation for the child and thus teaches the child that negative emotions are manageable but does not cultivate an interpersonal structure for the child's attempts to self-regulate. Alternatively, an adult who provides primarily problem-focused support may guide the child to self-regulate but shows no warmth or tolerance of emotions which may make the child to suppress emotions or self-regulation strategy generation.

In the study of Cole and colleagues (2009), maternal emotion-focused supportive reactions was shown to increase the recognition of emotional strategies but may not increase the generation of these strategies during frustrating episodes [21]. Conversely, maternal problem-focused supportive reactions (i.e., attempts to scaffold self-regulation) were related to increased generation of strategies to cope with frustration, but not to recognition. These mixed results suggest that the relationship between socialization and children's emotion regulation may be complex in nature, and that results are likely to have much to do with the time course of the study and the way that the behavior of socialization is conceptualized. Moreover, without a prospective design, a cross-sectional study could not reveal maternal contributions to children's emotion regulation.

In addition, although the socialization of emotion regulation is meant to regulate a child's conduct, it is not independent of the child's characteristics. The relationship and interaction between child and socialization practices is bi-directional and complex [22]. A child's temperament can be associated with the manner in which s/he regulates his/her emotions and reacts to specific caregiving behaviors. This in turn can affect the caregiving behavior of the adults [23]. Among the categories of temperamental behavioral styles that have been established with respect to childhood temperament, Rothbart and Derryberry's temperamental dimensions have been instrumental to the field and has guided much temperament research [24]. This study adopts Rothbart's model which conceptualizes temperament as structured into three broad clusters—effortful control, negative affectivity, and surgency/extraversion. The ways in which children's temperament may be related to the supportive reactions of their caregivers will be discussed in the following.

Effortful control

Effortful control (EC) is defined as a dimension of temperament related to the self-regulation of emotional reactivity and behavior, reflecting individual differences in the ability to voluntarily control attention, detect errors, and activate a subdominant response in place of a more automatic/dominant response [3,24]. Previous studies have indicated the importance of EC for many developmental outcomes, including more effective emotion regulation [25]. Children with high levels of effortful control have lower parental rejection due to energy conservation and feelings of competence [26,27]. Similarly, low EC was found to predict decreasing growth trajectories of parental monitoring across childhood and adolescence [28]. Thus, low EC of young children is hypothesized to predict low supportive reactions provided by their primary caregivers.

Negative affectivity

Negative affectivity (NA) includes anger/frustration, discomfort, fear, and sadness [29]. With regard to NA, one could argue that high NA decreases supportive reaction, because negative emotions are likely to be difficult for children to control and may interfere with caregivers' socialization efforts [30]. Repeated negatively affective behavior can lead to a frustration and feelings of insufficiency of childcare that can result in more non-supportive reactions. Thus, children with high levels of negative affectivity may make the modulation of emotional arousal difficult and may interfere with caregivers' socialization efforts. This proposition has found support in previous research; both concurrent and longitudinal research support the association between higher intensity of child negative emotions and increased negative parenting [26,31-33]. Therefore, high NA of young children is hypothesized to predict low supportive reactions provided by their primary caregivers.

Surgency/extraversion

Surgency/extraversion is a construct that includes impulsivity, intensity pleasure, and activity level, positive anticipation, and low shyness. Little is known about the direct relationship between young children's surgency/extraversion temperament and adult reactions to their negative emotions. However, there is some theoretical and empirical support for examining surgency/extraversion as a risk factor for decreasing caregivers' supportive reactions. Children with high levels of surgency/extraversion could be characterized as highly active and constantly exploring their environment with disregard for rules and little inclination to comply with requests, which may drive a caregiver to employ coercive methods of discipline, leading to frustration and decrease in supportive reactions [34]. High surgency/extraversion of young children is thus hypothesized to predict low supportive reactions provided by their primary caregivers.

It is important to examine the associations between the child's temperament and the process of socialization of emotion regulation. Previous research has primarily focused on the effects of the adults' supportive reactions on emotion socialization of children, but less attention has paid to the precursors of the supportive reactions. Given the fact to the significant role of the supportive reactions, more in depth research is required to study

the association of children's temperament and the socialization process in primary caregivers. This study aims to examine whether and how temperamental styles of young children affect supportive reactions of primary caregivers in dealing with their display of normally occurring negative emotions. This study investigates whether child temperament could predict two commonly used categories of supportive emotion regulation reactions - emotion-focused and problem-focused supportive reactions.

MATERIALS AND METHODS

Participants

We recruited 191 mothers with a child under 18 months of age, joining in a community day-time caregiver support system sponsored by Child Welfare Bureau in Taiwan. In addition, the day-time caregivers of the children of participating mothers were also recruited. The community day-time caregiver support system was established to provide financial subsidies of child care services for working mothers with a family annual income of NT$1,130,000 (i.e., US$36,000) and below (Note: the average family annual income in Taiwan at the year of study was NT$956,849). About 48% of the mothers graduated from high school, 39% graduated from college, and 13% attended graduate school. Mother-caregiver pairs were recruited through collaboration with a local support system that served approximately 400 infants and toddlers annually. Of those eligible, 48 percent of mothers and day-time caregivers (i.e., 191 pairs) were interested in and participated in this study for one year. Caregivers provided informed assent, while mothers provided informed consent for themselves and their children. The children were 43.9% female and ranged in age from 6.9 to 17.4 months (Mean = 11.8, SD = 3.58) at the beginning of the study. This study was approved by the research ethics committee of in Taiwan, and informed consent was obtained prior to participating. All data were obtained according to Kungtien General Hospital institutional review board (IRB) approved protocols (IRB# 007-05; title "Teaching strategies and young children's development of effortful control").

Assessments

Dimensions of child temperament: At the beginning of the study, the three dimensions of child temperament (i.e., negative affectivity, effortful control, and surgency/extraversion) were measured with a standard version of the revised Infant Behavior Questionnaire (IBQ-R), designed to assess temperament for children under age of 18 months. This shortened version has 37 liker-type items and has been shown to have well-established internal consistency, validity, and test-retest reliability [29]. Both mothers and day-time caregivers completed this questionnaire in traditional Chinese at the beginning of the study. The scales in the questionnaires provided acceptable reliabilities (Cronbach's α) for both mothers and day-time caregivers. The items measuring effortful control included those related to inhibitory control, attention control, perceptual sensitivity, and low intensity pleasure ($\alpha_{mothers}$=.86; $\alpha_{day\text{-}time\ caregivers}$= .85). The items assessing negative affectivity included those related to fear, sadness, discomfort, anger/frustration, and difficulty for soothability ($\alpha_{mothers}$=.83; $\alpha_{day\text{-}time\ caregivers}$=.78). The surgency/extraversion items included the ones measuring impulsivity, activity level, high intensity pleasure, and low on shyness ($\alpha_{mothers}$=.83; $\alpha_{day\text{-}time\ caregivers}$ =.86).

Supportive reactions to children's negative emotions: One year later, a measure developed by Stansbury & Sigman (2000) was used to assess adults' supportive reactions. This measure assessed two types of supportive reactions: a) emotion-focused (meant to comfort children), and b) problem-focused (meant to lead children through cognitive reappraisals by suggesting how the child might re-interpret the situation). Both mothers and day-time caregivers were asked about 6 situations in which children typically experience distress and negative affect 1) when the child was experiencing separation anxiety; 2) when the child was stopped when trying to put an inappropriate item into their mouths; 3) when the child was asked to play alone while mother/caregiver was busy, 4) when his/her favorite toy/transitional object disappears, 5) when the child was asked to put the toys away while he/she was enjoy playing with them; 6) when the child was asked to eat some food that he/she doesn't like. For each situation, mothers and day-time caregivers were asked to indicate how often they would provide each type of supportive reactions (i.e., emotion- and problem-focused supportive reactions). Two statements (each representing a type of supportive reactions) were used for each of the scenarios. For each scenario, the participants were asked to rate how often (on a scale ranging from always to never) for both statements.

The scales in the questionnaires provided acceptable reliabilities (Cronbach's α) for both mothers and day-time caregivers. The items measuring emotion-focused supportive reactions included those related to strategies that help the child feel better (i.e., comforting the child physically or verbally, for example, sings to child or rubs child's back to comfort the child and try to make him/her feel better ($\alpha_{mothers}$=.71; $\alpha_{day\text{-}time\ caregivers}$ = .81). The items assessing problem-focused supportive reactions included those related to strategies that encourage the child to cope with the problem or to reinterpret the salient features of a frustrating or negative emotional event, especially those that initially elicited negative emotion, in a more neutral or positive manner $\alpha_{mothers}$=.86; $\alpha_{day\text{-}time\ caregivers}$= .83).

Data Analyses

We evaluated whether each of the three temperamental dimensions of young children predicts the emotion- and problem-focused supportive reactions of mothers and day-time caregivers with four multiple regression analyses. Each of the multiple regression analysis helps one understand how the level of the dependent variable (i.e., a specific type of supportive reactions) changes when any one of the independent variables (i.e., each of the three dimensions of child temperament - effortful control, negative affectivity, and surgency/extraversion) is varied, while the other independent variables are held fixed.

RESULTS

We first examined the effect of the dimensions of child temperament on emotion-focused supportive behaviors. Effortful control was found to positively predict emotion-focused supportive reactions in both day-time caregiver (β=.18, p=.04) and mothers (β=.22, p=.02). Negative affectivity did not predict emotion-focused supportive reactions in both day-time caregivers (β=.02, p=.79) and mothers (β=.03, p=.71). Surgency/extraversion also did not predict emotion-focused supportive reactions in both day-time caregivers (β=-.01, p=.94) and caregivers (β=.07, p=.44). Taken together, the three dimensions of child temperament have significant effects on mother's emotion-focused supportive reactions (R^2 =.07, p<.05).

We then examined the effect of the dimensions of child temperament on problem-focused supportive behaviors. Effortful control was found to positively predict problem-focused supportive reactions in both day-time caregivers (β=.30, p<.01) and mothers (β=.32, p<.01). Negative affectivity did negatively predict problem-focused supportive reactions in day-time caregivers (β=-.14, p<.05), but not in mothers (β=-.06, p=.48). Surgency/extraversion also did not predict problem-focused supportive reactions in both day-time caregivers (β=-.07, p=.38) and mothers (β=.13, p=.14). Taken together, the three dimensions of child temperament significantly predict problem-focused supportive reactions in both day-time caregivers and mothers (R^2 =.11, p<.01, and R^2 =.15, p<.01, respectively).

Table 1: Regressions: Predictors of supportive reactions of mothers and day-time caregivers

	Emotion-focused supportive reactions as dependent variables		Problem-focused supportive reactions as dependent variables	
Predictors	β of day-time caregivers'	β of mothers'	β of day-time caregivers'	β of mothers'
Effortful control	.18*	.22*	.30**	.32**
Negative affectivity	0.02	0.03	-.14*	-0.06
Surgency/ extraversion	-0.01	0.07	-0.07	0.13
R^2	0.03	0.07	0.11	0.15

* $p < .05$; ** $p < .01$

DISCUSSION

All in all, the results of this study provide support for the study's proposition that child temperament is associated with certain supportive reactions of both primary caregivers. The purpose of this study was to examine whether child temperamental traits have effects on supportive emotion regulation reactions (i.e., emotional and cognitive responses) of mothers and day-time caregivers. The study results show the effects of child temperamental dispositions on adults' differential supportive socialization behaviors Thus, we recommend caregivers to always maintain supportive reactions and be aware that they should not be discouraged even if the impact on child's regulation is not immediate.

As effortful control is a dimension of temperament related to the self-regulation of emotional reactivity and behavior, parents and other caregivers need to be aware of children's individual differences in the ability to voluntarily organize attention, detect errors, and activate a subdominant response in place of a more dominant response [3,24]. Previous studies have shown that effortful control is associated with high responsiveness and positive guidance of parents/caregivers [14,35]. Nonetheless, the direction of effects underlying these associations is noteworthy. Children with higher effortful control are able to voluntarily control their motivation, attention, and actions and thus make their parents/caregivers more likely to feel efficient in assisting their children. However, if a parent/caregiver is aware that the child has poor effortful control, he/she may be more likely to use directive commands rather than supportive strategies [36,37]. As the result of this study shows, mothers/caregivers supportive reactions decrease as effortful control of the children was low in infancy. Therefore, parents/caregivers need to avoid non-supportive reactions while interacting with children who display low effortful control or emotion regulation.

However, the effect of negative affectivity on adults' supportive reactions was specific to day-time caregivers' problem-focused support, and did not have effects on day-time caregivers' emotion-focused support as well as mothers' problem- and emotion-focused support. The fact that children's propensity towards negative emotions predicted day-time caregivers' (but not mothers') cognitive supports may reflect one of two possibilities. First, it is possible that maternal bonding to the children since their birth might facilitate the emotional relationship between them and also make the cognitive supports about coping strategies different from those between children and non-parent caregivers. Secondly, mothers and children are related to a greater extent than caregivers and children. Evolution has led humans to invest more energy in their descendant offspring. Hence, mothers are likely more patient and resilient with their children such that negative affectivity does not inhibit their providing problem-focused supportive reactions.

One limitation of this study is that it relied on self-report assessments of mothers and caregivers. However, while this may be a limitation, there are also advantages to this procedure. Because of the variable nature of behavior and limitations in motor and verbal proficiency in this age range, the problem of clinical/observational assessment of child temperament is particularly acute in young children. The structured nature of the typical individual assessment by researchers may limit opportunities for observing effortful control and other characteristics in infants and toddlers. Thus, the primary caregivers possess a wealth of information about the child's behavior in everyday environment. Nevertheless, future research should use not only questionnaires but also observations to assess adults' supportive reactions.

Another limitation of this study is the fact that child temperament assessments were collected one year prior to adults' self-behavior assessments. Although it is possible that developmental shifts could have occurred in the children over the one year period, we do not expect it to be a major problem, because child temperament have been shown to be stable over time [38]. This may also be viewed as a strength of the study,

because children's temperament were conducted early in infancy, rather than later when an individual's socialized actions are viewed as personality traits [39]. However, future research should try to incorporate a more continuous measure of child and adult assessments. In particular, time lag designs could be used for this purpose.

Moreover, the present study did not administered a prospective design, thus direct relationships between children's characteristics and caregivers' supportive reactions coud not be revealed. Future work can jointly examine the effects of children's characterist and caregivers' supportive reactions at two time points in a single model, which we were unable to do given the lack of sufficient data. As the overall sample subjects of this study are Taiwanese, the findings of present study may not extend to other ethnic groups. Our results should also be considered specific to the developmental period of infancy and toddlerhood, and do not extend to other developmental stages. Future research needs to take parenting style into account, as it may has an impact on both child's temperament and caregivers' supportive reactions.

The collective effect sizes (R^2) of the predictor variables on the outcomes may not have been particularly large, although most of the effects were significant. However, given that this study is a preliminary attempt to study child-to-adult effect, and that there is scope to improve measurement and theory in this scheme of research, the significant effect sizes should be considered as important, even if relatively modest in magnitude.

CONCLUSION

Previous studies show that caregivers' support has effect on child behavior, but our study illustrates that the reverse is also true. The results of this study show that temperamental characteristics that conserve adults' energy and boost their self-efficacy increase supportive behaviors. Infants who tend to react to environmental demands with self-control (i.e., effortful control) were found to make it easier for both mothers and day-time caregivers to manage and to provide both comforting and cognitive support. However, infants have less effortful self-control hinder adults' supportive reactions and receive less comforting and cognitive supports.

In line with the previous research that found an association between children's poor regulation characteristics and parents' hostility and low quality social interactions [40], this study highlights the effects of children's temperamental characteristics on adults' supportive reactions in early life. Previous research has shown that supportive reactions to children's negative emotions facilitate children's attempts to constructively regulate emotion and to learn about the needs of others in emotion-evoking situations [10,11,16]. Caregivers need to be aware that they should not be discouraged even if their influence on child's regulation is not immediate. Moreover, if primary caregivers do have the knowledge that some aspects of the children's temperament can have effects on their supportive reactions, they can control or direct their caring behaviors in a more efficient and productive manner. This has implications for both parents and programs focusing on child development. Therefore, it is important that related programs of caregiver training and parent education should point out the need of increasing tolerance when interacting with children with low effortful control and/or high negative affectivity.

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DISCLOSURE

The authors declare no conflicts of interest.

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About the Corresponding Author

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Summary of background:

My graduate training in developmental psychology and early childhood education focused on typical social-emotional development, while my postdoctoral research interests focus primarily on children's individual differences in temperament/predispositions and how these differences affect their social-emotional development and their interaction with parents and teachers. These interests extend to determining how parenting moderates genetic and environmental influences on child behavior (i.e., gene-environment interaction).

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Current research focus:

- Examining within- and across-time relations between children's temperament and adults' supportive reactions with structural equation models to understand the contributions of children's temperament to their social interactions.
- Understanding the etiology of antisocial behaviors across childhood and adolescence with twin studies to understand the role of genotype-environment interplay.
- Obtaining a better understanding of the environmental, genetic and neurobiological factors that influence children's psychological functioning and behavior.

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