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Short-Term Resilience Processes in the Family

The authors review naturalistic studies of short-term processes that appear to promote resilience in children in the context of everyday family life and argue that warm and supportive family interactions foster resilience through their cumulative impact on children's emotional and physiological stress response systems. In the short-term, these family interactions promote the experience and expression of positive emotion and healthy patterns of diurnal cortisol. Over time, these internal resources – a propensity to experience positive emotion and a well-functioning hypothalamic-pituitary-adrenal axis system – enhance a child's capacity to avoid, or limit, the deleterious effects of adversity. This article highlights naturalistic research methods that are well suited to the study of these short-term resilience processes and points to clinical applications of our conceptual and methodological approach.

Resilience refers to positive development despite exposure to significant stressors that place individuals at risk for psychopathology and poor health (Luthar, Cicchetti, & Becker, 2000). Although the term is typically used to describe an outcome, processes that promote resilience are an important target for resilience research. For example, iterative and dynamic transactions between a child and his or her family may

promote the development of internal resources that help children respond to stressors in an adaptive fashion. We propose that certain qualities of everyday family life contribute to a propensity to respond with positive emotion and to a healthy diurnal cortisol rhythm that, in turn, act as emotional and physiological resources for coping with chronic stressors.

Some child-rearing practices seem to foster the development of more resilient children. For example, research suggests that parental warmth attenuates the prospective association between witnessing community violence and future elevated levels of depressive symptoms in children (Aisenberg & Herrenkohl, 2008). Findings like these are consistent with a protective model of resilience, in which a particular family characteristic minimizes the negative impact of stressors on child development. Other resilience models have also been described (Fergus & Zimmerman, 2005). According to a compensatory model, protective and risk factors are independently linked to outcomes (Garmezy, Masten, & Tellegen, 1984), such as the independent effects that a parent's smoking behavior and involvement in a child's life at school have on the likelihood that the child will smoke (Fleming, Kim, Harachi, & Catalano, 2002). An inoculation model posits that early exposure to mild stress can have a "steeling effect"; for instance, by affording opportunities to practice emotion regulation and coping strategies, which prepare children to respond more effectively to future stressors (Rutter, 2012).

Despite considerable research supporting each of the three models of resilience (Fergus & Zimmerman, 2005), little attention has been devoted to daily family processes that may underlie the associations they describe. An

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Key Words: diurnal cortisol rhythm, naturalistic research methods, parent-child interaction, positive emotion, resilience.

exception is DiCorcia and Tronick's (2011) focus on mild stress conferred by moments of miscommunication between parents and infants, which inevitably arise in even the most synchronous interactions. They suggest, in line with an inoculation model, that these moments permit infants to practice skills that are useful when facing future stressors. Here we explore underpinnings of the protective model of resilience by reviewing naturalistic studies of short-term family processes that may contribute to cross-sectional and longitudinal links between the family social environment and child resilience. We argue that warm, supportive, and responsive interactions with family members have an immediate influence on the functioning of children's emotion systems and hypothalamic-pituitary-adrenal (HPA) axis, and that these short-term effects help to account for the protection that these family factors seem to confer in the long run.

Naturalistic research methods are increasingly used by researchers to assess life "as it is lived" in families. Data may be collected through direct observations of families in everyday settings or intensive repeated measures, such as self-report forms ("daily diaries") completed by family members once or more each day. These approaches permit within-person and within-dyad analyses that examine how experiences in the family relate to short-term changes in an individual's internal state or behavior (Repetti, Reynolds, & Sears, in press; Repetti, Robles, & Reynolds, 2011). Although naturalistic studies of short-term processes within the family are not nearly as prevalent as other designs, our review focuses on them whenever possible to explore resilience processes in the context of daily family life.

This article has several objectives. First, we review research that suggests how resilience may be fostered in children's everyday family life, focusing in particular on their experiences with positive emotion and HPA axis functioning. A second goal is to highlight the promise and power of naturalistic research methods for investigating short-term resilience processes. A final objective is to discuss clinical applications of our conceptual and methodological approach.

Family Processes that Promote Resilience

This section presents the research foundation for our proposed model. It begins with the

prospective association between certain family characteristics and the resilience that is demonstrated by some children in the face of adversity. We then consider the role of positive emotion as an internal resource that protects children from the deleterious effects of stress and examine qualities of daily family interaction that are linked to children's experiences with positive emotion. Next, we discuss the HPA stress response system and examine how family interactions may be linked to HPA axis functioning in daily life. The section closes with a metaphor to illustrate how short-term emotion and physiological processes may translate into the long-term outcomes associated with resilience.

A secure and supportive relationship with a parent or caregiver seems to act as a buffer against the negative effects of a variety of chronic stressors. Children who are securely attached to at least one caregiver during infancy exhibit the ability to bounce back in middle childhood after a period of poor psychological adjustment in early childhood (Werner, 2013; Yates, Egeland, & Alan, 2003). Likewise, an authoritative style of parenting, characterized by high levels of emotional support, clear guidelines for child behavior, and bidirectional communication, is associated with resilience in the face of adversity, as are parental warmth and involvement (Aisenberg & Herrenkohl, 2008; Werner, 2013).

Warm and responsive parenting is characterized by frequent displays of affection, approval, and encouragement, and by helping and comforting behaviors (Darling & Steinberg, 1993). Several large-scale longitudinal studies have shown that children who have a warm relationship with at least one caregiver are more likely to demonstrate resilience in the face of poverty and economic hardship (Werner, 2013). The Kauai Longitudinal Study, which followed an ethnically-diverse cohort from before birth into their forties, found that toddlers who had a positive relationship with a caregiver were more likely to function well despite living in chronic poverty. In adulthood, those offspring were more likely to report psychological health, an absence of substance use problems and psychiatric disorders, and more success and satisfaction with work, family, and social life. Resilience was also demonstrated in relation to other risk factors, such as exposure to parental psychopathology and child abuse (Werner, 2013).

Family relationships characterized as warm and involved also mitigate the impact that exposure to threats of aggression have on mental health (Aisenberg & Herrenkohl, 2008). For example, the prospective association between being bullied and showing more emotional and behavioral problems was attenuated in children whose mothers reported higher levels of parental and sibling warmth (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010). A study of low-income children who witnessed community violence found that those who spent more time with family members had fewer anxiety and depression symptoms one year after the exposure (Hammack, Richards, Luo, Edlynn, & Roy, 2004). Moreover, in cross-sectional studies of children growing up in countries in which there is armed conflict, parental monitoring and support are associated with lower levels of depressive symptoms, antisocial behaviors, aggression, and general psychological maladjustment (Tol, Song, & Jordans, 2013).

The correlational and longitudinal studies that have established these links do not tell us what constitutes “warmth” or “support” in a child’s daily life, or how those family characteristics are linked to resilience. Next, we argue that the benefits are harnessed, at least in part, through the effects of everyday family interactions on children’s experiences with positive emotion and HPA axis functioning.

Positive Emotion. Positive emotion has psychological and physiological benefits for children and adults. A key component of resilience in the face of adversity, positive emotion protects children from the detrimental effects of early risk for emotional and behavioral problems (Bower, Low, Moskowitz, Sepah, & Epel, 2008; Wachs, 2006). Among children at risk for psychopathology, positive emotion is associated with more social and emotional competence, fewer behavioral and emotional problems, and less substance abuse (Wachs, 2006). Longitudinal studies that follow children into adulthood suggest that having an easy and affectionate temperament mitigates the negative impact of poverty on development (Werner, 2013). Positive emotion is also linked with better mental health among those who experienced maltreatment in early childhood (Cicchetti & Rogosch, 2009). In comparison to less well-adapted peers, maltreated children who showed more prosociality, fewer disruptive and aggressive

behaviors, and less withdrawal exhibited greater left hemisphere activity in the central cortical regions of the brain, which are associated with the propensity to perceive emotion as being positive (Curtis & Cicchetti, 2007).

Research suggests at least two pathways through which positive emotion may foster resilience. According to one model, positive emotion influences children’s subjective assessments of the severity and threat of stressors (Wachs, 2006). Subjective appraisals of threat, in turn, influence coping responses (Lengua & Long, 2002; Rueda & Rothbart, 2009). An alternative pathway suggests that displays of positive emotion create opportunities for the types of parent–child interactions that promote resilience (Wachs, 2006). Caregivers are more likely to behave in a warm and responsive manner to children who express more positive emotion and affection, resulting in more opportunities for emotional support and socialization.

There is no doubt that on a daily basis, families influence children’s experiences with positive emotion. Research suggests that the display or experience of emotion provokes a similar expression or mood in a social partner, including family members (Barry & Kochanska, 2010; Larson & Richards, 1994; Neumann & Strack, 2000). Not only is there a correlation between the average moods of adolescents and their parents, evidence also suggests modest moment-to-moment associations with fathers’ mood states when they are physically together (Larson & Richards, 1994). A naturalistic observational study in families’ homes found that mothers and fathers were more affectionate with their toddlers when the children were affectionate toward them. The reverse was also true; toddlers were more affectionate when their parents showed affection toward them (Barry & Kochanska, 2010).

Warm and supportive parent–child interactions are associated with reports of more positive and less negative mood. On a day-to-day basis, family support predicted higher levels of positive mood in a sample of seventh and eighth graders (Weinstein, Mermelstein, Hedeker, Hankin, & Flay, 2006). A study based on 2 weeks of diaries completed by ninth graders found a bidirectional association between the youths’ daily social interactions and mood (Flook, 2011). On days when they described more positive interactions with parents and peers, the teens also reported

more positive mood and less negative mood. Likewise, positive mood predicted more positive social interactions. A naturalistic observational study suggests how family members can help to sustain children's positive emotion. Video-recordings of daily family life showed that children were more likely to maintain positive emotion over 30-second periods whenever a family member also showed positive affect or touched the child (Bai, Repetti, & Sperling, 2014).

The research summarized here suggests that the emotional valence of family interactions has a short-term influence on children's positive emotion. By engendering positive emotion, families may help to build an internal resource that children employ when faced with stressors and thereby contribute to prospective associations between family warmth and resilience. Next, we examine the influence of positive family interactions on the HPA axis in daily life.

Hypothalamic-Pituitary-Adrenal Axis. The HPA axis is a key stress response system (Gunnar & Quevedo, 2007). Threats activate the HPA axis, which triggers the release of the hormone cortisol (Dickerson & Kemeny, 2004; Gunnar & Quevedo, 2007; Sapolsky, Romero, & Munck, 2000). Immediate increases in levels of cortisol in response to stress are observed over and above cortisol's strong diurnal rhythm in which circulating levels peak in the morning and steadily decline throughout the day. Diurnal cortisol is typically assayed from saliva samples collected several times a day, on one or more days (Adam & Kumari, 2009; Saxbe, 2008). Diurnal rhythms that reflect a well-functioning HPA system are characterized by a steeper slope of decline, a higher morning level, a lower evening level, and a lower average volume (Miller, Chen, & Zhou, 2007; Repetti et al., 2011).

Because cortisol affects a wide range of other physiological systems in the human body, dysregulated HPA axis activity is linked to a number of negative physical and mental health problems (Sapolsky et al., 2000). Adolescents with more internalizing problems (i.e., depression and anxiety) show flatter slopes of decline and higher evening concentrations of cortisol, in comparison to their healthy counterparts (Doane et al., 2013; Van den Bergh & Van Calster, 2009). Given its role as a physiological stress response system, healthy diurnal patterns of cortisol secretion may reflect a capacity for resilience, whereas a dysregulated system may

signal a decreased capability to withstand the detrimental effects of adversity (Obradović, 2012).

Early life experiences can influence the sensitivity of the HPA axis. Although chronic stress in early childhood may lead to subsequent dysregulation in HPA axis activity, warm caregiving may contribute to the development of a HPA axis that is better able to respond to external stressors (Gunnar & Quevedo, 2007; Obradović, 2012). Animal models and experimental studies indicate that positive social relationships can have a "social buffering effect," such that, in the presence of a responsive caregiver or other sources of social support, the HPA axis shows a dampened response to acute threat (Hostinar, Sullivan, & Gunnar, 2014).

Naturalistic research suggests that warm and supportive family interactions may influence children's diurnal cortisol activity in daily life. In a study of more than 700 children and adolescents, higher morning cortisol levels were linked to reports of more parental acceptance and more closeness with siblings (Booth, Granger, & Shirtcliff, 2008). Parental supportiveness, involvement, and warmth are associated with steeper slopes of cortisol decline in children (Ben-Dat Fisher et al., 2007; Pendry & Adam, 2007). In a diverse sample of adolescents, higher levels of parental monitoring were associated with steeper slopes, over and above the effect of a composite measure of multiple risk factors (e.g., interparental violence and parental depression; Martin, Bruce, & Fisher, 2012). Although most studies use questionnaire measures of family characteristics, the pattern of results was consistent in a naturalistic study that used an electronically activated digital voice recorder to capture interpersonal conflicts in the daily lives of preschoolers. Children who were exposed to less conflict had higher morning cortisol concentrations and steeper cortisol slopes (Slatcher & Robles, 2012).

In sum, more closeness and involvement in the family and a social climate marked by supportiveness, acceptance, and warmth are associated with higher morning concentrations of cortisol and steeper slopes over the day. Although more research is needed to assess the long-term implications for resilience, these are diurnal patterns that reflect a well-functioning physiological stress response system, an internal resource that may help children respond to and

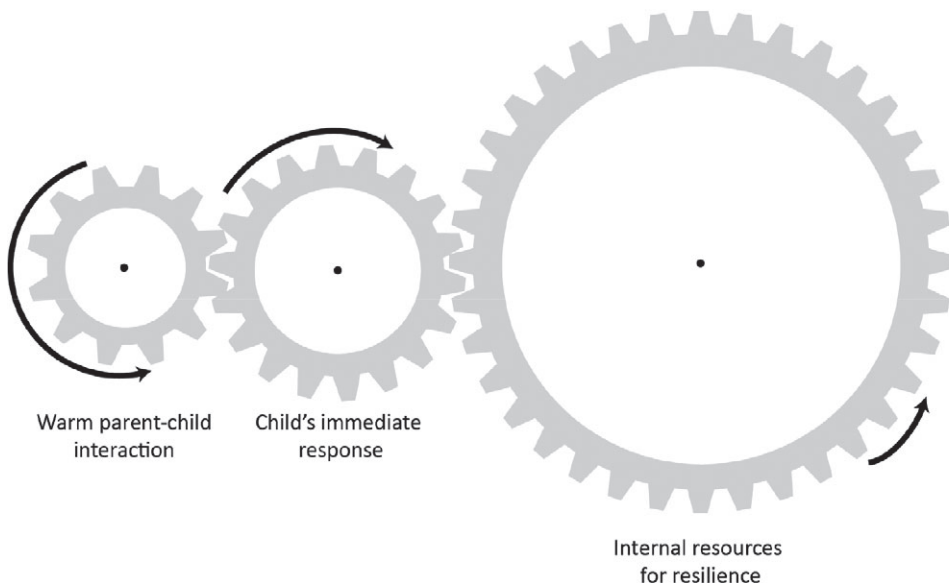
minimize the negative impact of acute stressors in daily life.

Implications of Short-Term Effects of Family Interactions for Resilience. We have argued that families that foster positive emotion and healthy HPA axis functioning strengthen internal regulatory systems that are involved in responding to stressors and ultimately promote resilience in children. Modeling the cumulative effects of a child's repeated experiences in the family requires a transition from immediate responses to longer-term repercussions. Repetti and colleagues (2011) introduced the metaphor of the action of meshed gears to illustrate how short-term reactions to stressful events may, if persistent over time, come to influence long-term health and development. They described the analogy of a sequence of meshed gears, each one slightly larger than the previous gear in the series. Initial gears with smaller diameters turn at a faster rate and act as drivers that gradually turn a larger, driven gear. There is a reduction in speed as revolutions of the first small gear ultimately lead to revolutions of a large gear later in the series; each successive gear turns more slowly. Just as gears change the speed of a power source, we are connecting short-term emotional and physiological

responses in the family to developmental shifts in children's regulatory mechanisms that are unfolding within a much longer time frame.

The long-term implication of warm and supportive interactions on child resilience is illustrated in Figure 1, which depicts a series of three meshed gears, each one successively larger than the previous one. A turn of the smallest and fastest revolving gear represents a warm family interaction and the child's immediate response to the interaction is represented by a turn of the second gear. The second gear moves the third gear, which illustrates the development of internal resources that provide protection against future stressors. The resilience resources that are built over a longer time span (such as a propensity to experience positive emotion and a well-functioning HPA system) are represented by the last, largest, and slowest revolving gear. As with any developmental outcome, resilience unfolds over time from early childhood to adolescence, and its manifestations may vary as a function of child age and development. The gears metaphor connects emotional and physiological processes that take place within the family over relatively short periods of time to internal resources that build over much longer periods of time.

FIGURE 1. GEARS AS A METAPHOR FOR ILLUSTRATING THE LINKS BETWEEN DAILY POSITIVE FAMILY INTERACTIONS AND RESILIENCE OVER THE LONG TERM.



Using Naturalistic Methods in Resilience Research

Intensive repeated measures and naturalistic video or audio recordings capture day-to-day variability in family members' experiences, internal states, and behaviors (Repetti et al., in press). The research discussed here included many naturalistic studies that utilized intensive repeated measures to examine within-person changes in positive emotion and HPA axis activity in relation to family interactions over relatively short periods. Although these methods are being increasingly used in family research, most of what we know about protective factors and resilience is based on traditional methodologies such as cross-sectional and longitudinal studies that rely on interviews and one-time questionnaires.

Enhanced ecological validity is the most obvious advantage to using naturalistic research methods (Almeida, 2005; Bolger, Davis, & Rafaeli, 2003). Questionnaires assess general characteristics of the parent-child relationship and child emotionality but impose cognitive burdens of recall and accurate description on respondents. To some degree, their reports reflect the participants' traits and response biases, in addition to specific experiences, internal states, and behaviors. In contrast, with an intensive repeated-measures approach, perceptions from multiple family members can be gathered on a frequent basis without requiring that participants recall and summarize events and interactions over prolonged periods of time (Bolger et al., 2003). Furthermore, because naturalistic methods are often used to assess variability within individuals rather than across individuals, selection biases are less likely to influence results (Bolger & Laurenceau, 2013). The processes discussed in this article can be studied by tracking day-to-day or moment-to-moment variations in individuals' perceptions and subjective experiences (Almeida, 2005; Bolger et al., 2003). When biological measures, like salivary cortisol, are integrated into naturalistic studies, it is possible to assess short-term associations between qualities of family interaction and diurnal HPA axis activity (Adam & Kumari, 2009; Papp, Pendry, & Adam, 2009; Slatcher & Robles, 2012), as well as study the effects of dynamic family variables, like physical proximity, on these short-term processes (Papp et al., 2009).

Laboratory-based observational methods also address some of the limitations of survey methods. However, the artificial settings typically impose unfamiliar physical and social parameters on the participants and may dampen the spontaneity with which the patterns of family interactions that are the focus of this article arise in everyday life. Recording families in their ordinary environments offers a unique opportunity to observe how the short-term processes described here arise in the context of spontaneous interactions (Repetti et al., in press). The UCLA Center on the Everyday Life of Families conducted one such study. An interdisciplinary team of researchers video recorded the lives of 32 dual-earner middle-class families over the course of a week. Family members also completed diaries and provided saliva samples at multiple points on 3 days (Ochs & Kremer-Sadlik, 2013). This rich data archive is extending our understanding of short-term family processes that may be related to resilience, such as patterns of family interactions after work and school (Campos, Graesch, Repetti, Bradbury, & Ochs, 2009) and situational contexts of children's emotion expressions in the home (Bai et al., 2014; Campos et al., 2013; Sears, Repetti, Reynolds, & Sperling, 2014). Other direct recording methods and designs have also been used to assess family processes in ecologically valid contexts. For instance, to study how exposure to conflict relates to preschoolers' diurnal cortisol, Slatcher and Robles (2012) had the children wear electronically activated recorders (EAR), a tool that unobtrusively records ambient sounds (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001).

The richness of naturalistic data is balanced by complex and intensive data collection and processing procedures. Participants provide information over several days to weeks, sometimes multiple times each day. To obtain naturalistic video or audio recordings, researchers may be present in the home, or family members might carry recording devices, over prolonged periods. It is possible to retain ecological validity with more focused assessments in the participants' natural environments. For example, past studies have limited video recording to specific periods in the day, such as the parent-child reunion at the end of the parent's work day (Repetti & Wood, 1997).

Emerging technology helps researchers balance thoroughness and efficiency. The costs of

collecting and processing naturalistic data have been reduced by technological advances such as increased accessibility of the Internet, the widespread ownership of mobile devices, and video analysis software (Knoll & Stigler, 1999). The many challenges that remain are offset by the promise that a more detailed and textured look at the everyday lives of families will contribute new insights to our understanding of how families help to build resilient children.

Future Directions. We highlight several directions for naturalistic research on resilience processes in the family. First, the approach that we are advocating requires a more detailed picture of the specific dimensions of interactions that shape children's stress response systems. This article focuses on warm and supportive family processes, but parenting that facilitates the de-escalation of conflict and that helps children regulate negative affect surely also fosters resilience.

Second, though there exists a substantial body of research to support the role of positive emotion as a mediator of resilience, that is not the case for diurnal patterns of HPA axis activity. We know very little about how diurnal cortisol rhythms relate to patterns of acute HPA reactivity and to resilience in the face of chronic stress. This relates to a larger need to incorporate the effects of risk and resilience processes within the same model. This article is focused on a protective model of resilience, one in which families help to build internal resources that children carry into stressful situations. A more complete model would integrate these ideas with research on physiological and emotional responses to chronic and acute family stressors.

Our review emphasizes within-family and within-person variability in patterns of social interaction and internal states. However, we expect variability in those short-term processes. For example, children differ in their sensitivities or susceptibilities to the influences of the family environment (Belsky, Bakermans-Kranenburg, & IJzendoorn, 2007; Boyce & Ellis, 2005). These variations may be associated with age, sex, and individual differences in temperament and behavior. An important next step is to investigate how group- and individual-level variables moderate the short-term processes discussed here.

Finally, it is critical to distinguish causal processes from correlational associations (Larzelere

& Cox, 2013). Children's behaviors and characteristics contribute to the short-term associations discussed here. Positive emotion expressions provoke affectionate and warm interactions with family members, whereas disruptive behaviors and anger provoke more negative interactions (Pettit & Arsiwalla, 2008; Wachs, 2006). One way to improve the validity of causal inferences is through case-control designs that consider how short-term resilience processes unfold in different populations, such as children who exhibit externalizing problems or families living in risky neighborhoods. In addition, longitudinal studies that test prospective associations between the short-term processes discussed here and children's adaptation to future stressors are needed to evaluate the causal assumptions at the core of our model.

Clinical Implications

The conceptual orientation and naturalistic methods advocated here dovetail nicely with the goals and substance of clinical interventions to improve the daily lives of families. We have argued that psychological and physiological stress response systems are shaped by everyday social interactions with parents and siblings. It follows that parent training programs and other cognitive-behavioral interventions can promote resilience in children by modifying daily interactions in the family. For example, teaching parenting skills such as emotional communication and appropriate uses of positive reinforcements promotes warm and synchronous parent-child interactions in the home and reduces externalizing problems in children (Wyatt Kaminski, Valle, Filene, & Boyle, 2008).

Recent intervention studies have successfully targeted daily HPA axis activity by altering parent behaviors (Slopen, McLaughlin, & Shonkoff, 2014). The results of an intervention study that focused on foster children in transition between caregivers were consistent with the idea that certain types of family interactions promote resilience by strengthening the HPA axis (Fisher, Van Ryzin, & Gunnar, 2011). Prospective caregivers in the intervention group received training designed to foster a warm and responsive caregiving environment. The children assigned to those foster homes maintained normative ranges of cortisol production throughout the stressful transition to a new caregiver environment,

whereas children in the control group showed HPA axis dysregulation after placement. HPA axis functioning may underlie psychological and behavioral gains that result from participation in family intervention programs (O'Neal et al., 2010)

We have argued that the functioning of the HPA axis and positive emotion experiences help to mediate links between parental warmth and child resilience. Thus, diurnal cortisol rhythm and emotional states may be useful markers of short- and medium-term gains in therapy (O'Neal et al., 2010; Slopen et al., 2014). Although it may require years to evaluate treatment success with respect to clinically significant levels of psychopathology, the effectiveness of an intervention on daily patterns of family interaction, mood, and cortisol activity can be assessed on a weekly or monthly basis.

Using Naturalistic Methods in Family Interventions. Behavioral monitoring, which is akin to diary methods used in research, is a key component of several psychotherapeutic treatments. *Monitoring* refers to recording thoughts, emotions, behaviors, and situations between sessions, during the course of treatment. The records are used to inform the parents, children, and clinicians of the families' interaction patterns, treatment fidelity, and progress (Chorpita et al., 2010). It would be possible to adapt naturalistic research tools to facilitate daily monitoring in family interventions. For example, during an assessment phase, families could provide information about patterns of social interaction and emotion in the home through intensive repeated measures or video recordings. Information about situational antecedents to the short-term resilience processes described here would offer insight into naturally occurring opportunities to intervene. Therapists could use intensive repeated measurement data to tailor interventions that target the family's particular needs, such as the enhancement of certain types of parent-child interactions at specific points in the day, and provide individualized feedback throughout treatment.

This general approach is analogous to parent-child interaction therapy (PCIT), in which a therapist observes the dyad in a therapy room and provides real-time coaching to the parent through a bug-in-the-ear device to encourage more positive and cooperative interactions (Eyberg, 1988; Thomas & Zimmer-Gembeck,

2007). Although this approach might not be indicated for all families, future interventions can benefit from the incorporation of more enhanced modes of monitoring, such as naturalistic video recordings or intensive repeated measures. With the widespread availability of mobile devices such as tablets, and devices with built-in cameras such as cell phones, parents can track children's behaviors with more ease and bring recordings of everyday family interactions into therapy sessions to receive specific and individualized corrective feedback that is more generalizable to their daily lives. Whereas video provides information about contextual factors surrounding problem behaviors, brief and simple assessment tools, such as the Brief Problem Checklist (Chorpita et al., 2010), Behavior Record Cards (Nadler & Roberts, 2013), and Youth Top Problems (Weisz et al., 2011), efficiently monitor specific target behaviors.

Through the use of mobile technology, clinicians can also dispense these types of interventions to families in their natural settings. Ecological momentary interventions (EMIs), which deliver treatments directly to clients as they go on about their daily lives, have been used for health behavior change and problems such as anxiety and eating disorders (Heron & Smyth, 2010). Treatment-related instructions and prompts are sent to mobile devices at specific moments in the day through text messages, voice messages, picture messages, or more complex web-based applications. A meta-analysis of 27 EMIs showed that they reduced the number of in-person sessions necessary for treatment completion. More than half of the participants complied with treatment protocol and reported favorable reactions to the design (Heron & Smyth, 2010). EMIs can be adapted for at-risk families. For example, warm parent-child interactions can be promoted through direct, real-time suggestions to parents and children in response to their self-reports, and they can be used between sessions to help generalize treatment gains.

Electronic data collected over the course of treatment can be used to provide immediate feedback to families, to identify and address environmental or contextual barriers to treatment effectiveness, and to customize interventions to fit each family's unique strengths and weaknesses. In addition to increasing the generalizability of treatment gains, these nontraditional treatment modalities also increase the accessibility and availability of mental health

services by reducing the time, travel, and cost burdens associated with receiving in-person psychotherapy, and by making therapy more integrative with daily life (Kazdin & Blase, 2011).

Conclusion

Warm, responsive, and supportive family interactions may foster resilience through their cumulative impact on children's emotional and physiological stress response systems. More research is needed to understand how positive experiences in daily family life promote positive emotion and adaptive patterns of diurnal cortisol and how those short-term processes may, over time, build internal resources that protect against the detrimental effects of chronic stressors. Naturalistic methods, such as in-home observations and intensive repeated measures, are well suited for studying short-term resilience processes and can be used in the design and evaluation of family interventions, improving their generalizability to daily life.

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