Variable- and person-centered approaches to examining temperament vulnerability and resilience to the effects of contextual risk

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Abstract

Using both variable- and person-centered approaches, this study examined the role of temperament in relation to children’s vulnerable or resilient responses to cumulative risk. Observed reactivity and regulation dimensions of temperament were tested as mediating and moderating the relation between family cumulative risk and teacher-reported adjustment problems in a sample of 259 preschool-age children. Further, latent profile analyses were used to examine whether profiles of temperament, accounting for multiple characteristics simultaneously, provided additional information about the role of temperament in children’s responses to risk. Results support a diathesis-stress model in which high frustration, low fear, and low delay ability confer particular vulnerability for children in high-risk contexts. Benefits of multiple approaches are highlighted.

1. Introduction

Low income has consistently been found to relate to increased risk for psychopathology, maladjustment, and negative health outcomes and has specifically been shown to predict greater adjustment problems in children (Bradley & Corwyn, 2002; Duncan, Ziol-Guest, & Kalil, 2010; Lengua & Wachs, 2012). The effects of low income, however, are in part accounted for by association with a broader context of risk, including greater experience of stress, residential instability, neighborhood problems, family conflict and disorganization, parental mental health problems, and numerous other risk factors that often co-occur. This co-occurrence of risk impacts children’s development through exposure to a heavier burden of adversity disproportionately experienced by lower income families compared to higher income families and may account for the effects of low income on child adjustment (Lengua, 2002; Lengua et al., 2015). Aggregation of co-occurring risk factors, or cumulative risk, allows for testing ecological models that jointly consider demographic, psychosocial, and environmental risk (Evans, 2003), the joint impact of which may not be fully captured by income level alone. For instance, cumulative risk has been found to relate to increases in children’s internalizing and externalizing problems above and beyond the effects of socio-economic risk (Lengua, Bush, Long, Kovacs, & Trancik, 2008). Despite consistent evidence supporting the corrosive effects of cumulative risk on children’s adjustment, exposure to contextual risk does not definitively undermine development (Kim-Cohen, Moffitt, Caspi, & Taylor, 2004). The developmental impact of contextual risk depends on a number of factors, including individual child characteristics, such as temperament, which may contribute to differential outcomes, either vulnerability or resilience, in response to risk. This study examined the potential mediating and moderating roles of temperament in accounting for the effects of cumulative risk on child adjustment utilizing both variable- and person-centered approaches. This study clarifies both the potential mechanisms of the effects of temperament and the possible interplay of multiple temperament characteristics.

1.1. Temperament

Temperament is often defined as biologically based individual differences in reactivity and self-regulation that are typically expressed as response differences in intensities, latencies, durations, thresholds, and recovery times. These individual differences appear in the first few years of life and remain relatively stable over time, but may be influenced by heredity, maturation, socialization and contextual experience (Rothbart, Ahadi, & Hershey,
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textual risk in unique ways.

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temperature, specifically differential reactivity and differential

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leading to unchecked approach or avoidance reactions, and less


standardized as effortful control, refer to processes that serve to alter

Regulatory components of temperament, most often conceptual-

The ability to delay gratification is the capacity to tolerate defer-

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effects to affect and excitability of motor responses and

includes, among others, reactivity to fear and frustration. Although

often studied as a single construct (i.e., negative reactivity), limited

ability to delay reward or the speed of response initiation and is

Executive control, which is defined as the capacity to inhibit a

and reward seeking behaviors and offensive aggression (Deater-

Defensive reactions, particularly in response to competing or

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which produces inhibition of ongoing behavioral programs, increased sympathetic activity, heightened attention to relevant or novel stimuli in the environment, and subsequent defensive and withdrawal behaviors typical of fear reactions (Kagan, 2013). In contrast, frustration reactivity, particularly in response to competition for resources and removing a frustrating obstacle, is linked to the behavioral activation system (BAS) resulting in appetitive and reward seeking behaviors and offensive aggression (Deater-Deckard & Wang, 2012; Depue & Iacono, 1989). As fear and frustration appear to reflect distinct processes, they may confer differential risk for the development of problems and may interact with contextual risk in unique ways.

Regulatory components of temperament, most often conceptualized as effortful control, refer to processes that serve to alter emotion reactivity through mechanisms like executive control and ability to delay gratification (Rothbart & Derryberry, 1981). Executive control, which is defined as the capacity to inhibit a dominant response in favor of initiating a more adaptive, subdominant response. It is a later appearing component of temperament than the more reactive characteristics and has been linked to positive adjustment (Eisenberg et al., 2004; Lengua, 2006; Lengua et al., 2008; Murray & Kochanska, 2002; Rothbart & Bates, 2006).

The ability to delay gratification is the capacity to tolerate deferring immediate reward or the speed of response initiation and is specifically tapped when the regulation of affect and motivation is necessary for successfully navigating emotionally evocative contexts (Mischel & Ayduk, 2011). Although these two components of effortful control are necessarily related and work as an integrated system (Rothbart & Bates, 2006), they also appear to differ in related neural activity, developmental course, antecedents, and relations to adjustments (e.g., Hongwanishkul, Happaney, Lee, & Zelazo, 2005; King, Lengua, & Monahan, 2013).

Both reactive and regulatory components of temperament have been identified as important predictors of children’s adjustment (Lengua, 2002; Liew, Eisenberg, & Reiser, 2004; Muris & Ollendick, 2005), and additionally predict adjustment over and above the effects of contextual risk (e.g., Coracpi, 2008; Lengua, 2002). Thus, temperamental characteristics may independently, either in isolation or in combination with additional risk factors, impact adjustment. Beyond direct effects, temperament dimensions may interact suggesting the impact of one dimension of temperament is likely to depend, in part, upon the presence and strength of other dimensions within an individual’s profile (Zentner & Bates, 2008).

Specifically, effortful control may moderate the relationship between high reactivity and maladjustment, with high reactivity acting as a buffer to provide the capability to modulate emotion reactivity or behavioral responses to reactivity, and subsequently reduce the risk of psychopathology. In contrast, highly-reactive children with lower regulation may experience an intensity of negative emotion that overwhelms the deficient regulatory system leading to unchecked approach or avoidance reactions, and less flexible or less effective strategies for coping with stressors (Muris & Ollendick, 2005). Less reactive children, however, may not require as strong of a regulatory system to control affect and behavior, remaining resilient even at lower levels of self-regulation. Prior research has found support for effortful control acting as a protective factor by buffering the impact of high negative emotionality on problems in relation to children’s internalizing and externalizing problems (Garstein, Putnam, & Rothbart, 2012; Lawson & Ruff, 2004; Muris, 2006), as well as social competence (Eisenberg, Fabes, Guthrie, & Reiser, 2000). Thus, effortful control may be particularly important for children with high negative reactivity.

1.2. Risk, temperament, and adjustment

Temperament may contribute to or alter the effect of cumulative risk on children’s adjustment either through mediation or moderation processes. Mediation would suggest that income related risk might shape or alter development and expression of children’s temperament, particularly in young children, which may then subsequently increase children’s risk for maladjustment. In this way, individual differences in temperament dimensions may account, at least in part, for the relation between risk and adjustment. Supporting this, low income, exposure to more sociodemographic and residential stressors, and cumulative risk were shown to relate to children’s lower executive control and higher negative reactivity, both of which, in turn, predict poorer adjustment outcomes (Lengua & Wachs, 2012; Li-Grining, 2007; Raver, 2004). Additionally, cumulative risk has been found to disrupt children’s development of delay ability, which accounted for some of the effect of risk on children’s adjustment (Lengua et al., 2015). Therefore, exposure to risk may shape the nature and course of temperament leading to higher rates of problem behavior, and thus, indirectly relate to adjustment through its effect on temperament dimensions.

In addition to mediated pathways, individual differences in temperament may moderate the effect of contextual risk on adjustment, with certain characteristics serving to either mitigate or exacerbate the impact of risk. Significant moderation by temperament suggests that the influence of risk on children’s adjustment depends on the relative strength of various temperament dimensions. Several different models have posited moderating effects of temperament, specifically differential reactivity and differential susceptibility or biological sensitivity to context models.

The differential reactivity model suggests that children’s responses to the same contextual factors may vary based on individual differences in temperament (Wachs, 1992). This model is consistent with both diathesis-stress models and vulnerability models, allowing for temperament to relate to children’s response to risk in different ways. For instance, high emotion reactivity may increase children’s vulnerability to the stress and unpredictability of living in a low-income environment, resulting in poorer adjustment than less reactive children in the same context (Comas, Valentino, Bridgett, & Hayden, 2014; Wachs, 2006). Additionally, effortful control may protect or buffer children from risk, contributing to their resilience in response to risk. For example, prior research has found that children with low effortful control living in high risk contexts showed poor adjustment, but those with high effortful control demonstrated equivalent adjustment to children living in low risk contexts (Flouri, Midouhas, & Joshi, 2014; Lengua, 2002). This pattern would be consistent with a diathesis-stress model where temperamental risk factors act as a diathesis within the context of stress associated with low income. Conversely, certain temperament characteristics may relate to poorer adjustment regardless of context. In the absence of temperamental
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