



## Household chaos and children's cognitive and socio-emotional development in early childhood: Does childcare play a buffering role?



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### ABSTRACT

Evidence suggests that household chaos is associated with less optimal child outcomes. Yet, there is an increasing indication that children's experiences in childcare may buffer them against the detrimental effects of such environments. Our study aims were to test: (1) whether children's experiences in childcare mitigated relations between household chaos and children's cognitive and social development, and (2) whether these (conditional) chaos effects were mediated by links between chaos and executive functioning. Using data from The Family Life Project ( $n = 1235$ )—a population-based sample of families from low-income, rural contexts—our findings indicated that household disorganization in early childhood was predictive of worse cognitive and social outcomes at approximately age five. However, these relations were substantially attenuated for children attending greater childcare hours. Subsequent models indicated that the conditional associations between household disorganization and less optimal outcomes at age five were mediated by conditional links between disorganization and less optimal executive functioning.

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Children growing up in low-income ecologies often face multiple risk factors that can have negative impacts on their cognitive and social development (Dearing, Berry, & Zaslow, 2006; Evans, 2004). In particular, children in families facing economic adver-

sity are more likely to experience chaotic home environments, marked by higher levels of disorganization and instability (Bradley & Corwyn, 2002; Vernon-Feagans, Garrett-Peters, DeMarco, & Bratsch-Hines, 2012). Notably, young children raised in such contexts also spend substantial amounts of time in settings outside of their homes, like childcare. In the U.S., approximately 43% children in poverty attend regular non-parental care by nine months of age (Capizzano & Adams, 2003). There is a growing indication that such childcare experiences may play a buffering role against the detrimental effects of high-risk contexts on children's development. Using data from a representative sample of children from two poor, rural regions of the U.S., the first aim of the present study was to consider whether links between early household chaos and children's subsequent cognitive and social development were mitigated by their early childcare experiences. Our second aim was to test the extent to which these (conditional) relations with chil-

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dren's broader cognitive and social outcomes were explained by links between these early experiences and children's development of executive functioning—a potentially key mechanism that shows notable growth across early childhood (Willoughby, Wirth, & Blair, 2012).

### Low-income contexts, chaos, & development

Families experiencing material hardship often face a variety of stressors that can negatively impact the organization and predictability of children's day-to-day experiences at home (Evans & Wachs, 2010). In the sample considered in the present study, for example, parents from families that are near or below the poverty line are more likely to be employed in lower-paying, service-sector jobs. Such employment often entails irregular and inconsistent work hours that make it more difficult to establish regular, organized family routines (Vernon-Feagans et al., 2012b). Low-income families also have less access to more spacious and higher quality living spaces. As such, on average, they tend to experience environments that are more densely populated, noisier, and disorganized (Evans, 2004; Evans & English, 2002). Children from low-income contexts are also more apt to face higher levels of household transience, as individuals join and leave the household (Vernon-Feagans et al., 2012b). Collectively, these aspects of disorganization, unpredictability, and instability are often considered under the umbrella term *chaos* (Evans & Wachs, 2010).

There is considerable evidence that chaotic home environments are associated with less optimal cognitive and socio-emotional development in childhood. Based on findings from studies using one of the most common measures of household chaos – the Chaos, Hubbub, and Order Scale (CHAOS; Matheny, Wachs, Ludwig, & Phillips, 1995) – higher levels of parent-rated household chaos in kindergarten have been linked with lower child IQ and worse conduct problems in first grade (Deater-Deckard et al., 2009). Similar associations are evident between self-reported household chaos in middle-childhood and children's subsequent levels academic achievement and problematic behavior at age 12 (Hanscombe, Haworth, Davis, Jaffee, & Plomin, 2011; Jaffee, Hanscombe, Haworth, Davis, & Plomin, 2012).

Links between chaos and cognition also extend to chaos measured as a function of its component parts—such as instability and disorganization. For instance, in prior work with the same sample of children as used in the present study, Vernon-Feagans et al. (2012b) measured household chaos using composite measures comprised of largely observer ratings of household instability and disorganization (see description in *Measures*), and found that higher levels of household disorganization (though not instability) in early childhood were predictive of lower levels of receptive and expressive vocabulary at the age of three. Similar relations are evident between household crowding and general measures of children's cognitive development in early childhood (Evans et al., 2010), and between household instability and behavior problems in adolescence (Marcynyszyn, Evans, & Eckenrode, 2008). Indeed, using long-term longitudinal data from the *Panel Study of Income Dynamics (PSID)*, (PSID), Dunifon, Duncan, and Brooks-Gunn (2001) found that household disorder and uncleanliness in childhood was predictive of children's lower levels of educational attainment and earnings upwards of 25 years later.

The mechanisms linking household chaos with less optimal developmental outcomes remain somewhat unclear. These relations are likely partially explained by the secondary effects of household chaos on parents' abilities to accurately read, interpret, and respond to their children's needs. Indeed, in prior work with the same data used in the present study, links between observed

household chaos and children's emerging language abilities were partially explained by indirect effects of chaos on maternal sensitivity (Vernon-Feagans et al., 2012b). Notably, there was also evidence of direct relations between household chaos and these language outcomes, after adjusting for maternal sensitivity and a wide array of potential confounds.

Such direct relations between chaos and children's development are consistent with theoretical work positing that household chaos has direct effects on children's abilities to regulate attention and arousal (Evans & Wachs, 2010). For instance, some have proposed that children raised in chaotic environments may adapt to these contexts by shifting their attention away from over-stimulating and unpredictable stimuli, essentially “tuning out” from the environment (Evans, 2006). In the short term, this may be an adaptive solution to down-regulate over-arousal. In the long term, however, it may also reduce their exposure to important aspects of socialization and, in turn, negatively affect children's cognitive and socio-emotional development. In particular, dyadic exchanges between young children and important adults are thought to support young children's abilities to maintain and volitionally control their attention (Conway & Stifter, 2012). As above, children facing more chaotic environments tend to experience fewer and lower quality interactions with caregivers in the home (Vernon-Feagans et al., 2012b). Further, when they do occur, the unpredictability and over-stimulation of these environments presumably render such exchanges comparatively less supportive.

Aspects of the environment that are not acutely overwhelming or unpredictable, per se, may have similar effects on children's abilities regulate attention and emotion. For instance, experimental work has shown that ambient noise as seemingly benign as the consistent din of a television playing in the background can have pronounced negative effects on toddlers' abilities to maintain sustained attention during typical play (Schmidt, Pempek, Kirkorian, Lund, & Anderson, 2008)—a building block to the development of more volitional aspects of executive attentional control (Blair, Berry, & Freidman, 2012; Posner & Rothbart, 2007). These findings are consistent with several studies showing links between chronic noise exposure and poorer attention with older children and adults (Evans, 2006).

Highly chaotic environments may affect children's language and early literacy development through similar mechanisms. Overstimulation—perhaps mediated through children's taxed attentional and executive systems—may challenge young children's ability to encode, process, and interpret linguistic information (Evans, Maxwell, & Heart, 1999). Although (to our knowledge) such indirect relations have yet to be tested empirically, several studies have noted moderate to strong links between better executive functioning and larger receptive vocabularies in early childhood (Blair & Razza, 2007; Hughes & Ensor, 2007).

As noted above, although direct associations are evident between household chaos and children's subsequent social development (e.g., externalizing problems), these relations may similarly be partially explained by links between household chaos and children's emerging executive-functioning abilities. Converging evidence across early childhood and beyond suggests that effective executive-functioning skills are associated with lower levels of externalizing-type behaviors (Hughes & Ensor, 2011; Schoemaker, Mulder, Deković, & Matthys, 2013).

Thus, taken together, theory and accumulating evidence suggests that household chaos is predictive of less optimal cognitive and social development. Although the mechanisms underlying these relations are less clear, links between household chaos and children's broader cognitive and social development may be partially explained by the negative relation between household chaos and children's emerging executive-functioning abilities.

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