Kindergarten readiness profiles of rural, Appalachian children from low-income households

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ABSTRACT

The present study used a person-centered approach to examine profiles of school readiness among entering kindergartners in rural, Appalachian communities. Aims were twofold: to determine the extent to which reliable profiles may characterize kindergartners' school readiness, with readiness encompassing language, literacy, math, socio-emotional skills, and learning-related behaviors; and to identify potential predictors of children's kindergarten readiness profiles. Participants included 396 entering kindergartners. Results of latent profile analysis showed there to be four profiles of kindergarten readiness: global risk (16% of children), academic risk (35%), sociobehavioral risk (13%), and readiness (36%). In general, predictors of profile membership included sex, race, family income, maternal education, and pre-k classroom quality. Study results show that a non-trivial percentage of children (49%) exhibit academic readiness, and 71% exhibit socio-behavioral readiness. This work improves our understanding of profiles of children from rural, Appalachian communities at school entry, and factors that may contribute to positive kindergarten readiness.

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1. Introduction

Kindergarten readiness is a multidimensional, theoretical construct representing children's preparedness for participation in formal schooling, which more often than not corresponds to kindergarten entrance in the twenty-first century (Duncan et al., 2007; Hair, Halle, Terry-Humen, Lavelle, & Calkins, 2006; Justice, Bowles, Pence Turnbull, & Skibbe, 2009). It is generally accepted that children who arrive to school "ready to learn" will have more optimal academic achievement over time than children who do not. In support of this point, a considerable number of longitudinal studies have shown that children's language, literacy, math, and social-emotional skills as well as their learning-related behaviors (e.g., attention) at or around kindergarten entry are positively correlated with their future academic achievement (Duncan et al., 2007; McClelland, Acock, Piccinin, Rhea, & Stallings, 2013). Pre-kindergarten programs, especially those that are publicly funded and target enrollment to children from at-risk backgrounds, are correspondingly expected to enhance children's readiness for kindergarten and intervene with those children who are deemed at-risk for not being for ready.

Despite consensus about the importance of kindergarten readiness and the value of improving readiness for children at-risk for being unready, in reality we have limited empirical understanding of how best to determine whether a child is or is not likely to be ready for schooling, which demands a particular level of skills for children to be successful. Indeed, much of the research identifying indicators of kindergarten readiness has relied on variable-centered approaches to examine the relations between specific indices of school readiness, such as letter recognition and phonological awareness, and future achievement indices (Holliday, Cimetta, Cutshaw, Yaden, & Marx, 2014; Stormont, Herman, Reinke, King, & Owens, 2015). While such studies consistently show the positive, predictive relations between school-readiness indices and future achievement variables, they are not particularly helpful for more applied efforts in which we seek to determine whether some children are or are not likely to be school-ready. For instance, assessing children's performance across individual indices of school readiness limits our understanding of how skills across multiple domains interact within children and pattern together to result in qualitatively different readiness characteristics.

Person-centered approaches to studying kindergarten readiness can be helpful in this regard. Such work seeks to determine whether there are profiles of children's readiness scores across multiple measures, just prior to or at kindergarten entry, that correspond to readiness for schooling or, alternatively, a lack of readiness for schooling (e.g., Hair et al., 2006; Pentimonti, Justice, & Kaderavek, 2014). The benefit of profile analyses, such as latent class analysis and cluster analysis, is that they can help to identify how the various dimensions of kindergarten readiness coalesce within clusters, or profiles, of children (Halle, Hair, Wandner, & Chien, 2012). Given that a child's readiness for school reflects a number of different dimensions, including pre-academic skills (math, language, and literacy), social-emotional skills, and learning-

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related behaviors, profile analyses can explore how skills across these various dimensions exist in combination to define groups of children's readiness characteristics. This methodology allows us to identify subgroups of children that may be at greater risk due to the pattern of functioning across multiple areas of development. Further, by following children's readiness profiles over time, we can begin to understand whether a given profile of school readiness corresponds to specific outcomes of interest, such as academic under-achievement (e.g., Cabell, Justice, Logan, & Konold, 2013) or social adjustment (e.g., Hair et al., 2006).

A handful of studies using profile analyses to better understand kindergarten readiness have appeared in the literature. In an initial application of profile analysis to kindergarten readiness, Hair et al. (2006) studied a nationally representative sample of kindergarteners (from the Early Childhood Longitudinal Study-K) to examine readiness profiles with respect to cognition, social-emotional skills, and physical health. Results showed there to be four profiles characterizing children at kindergarten entry: whereas slightly more than half (54%) of the children fit into one of two generally positive profiles, 46% of children fit into one of two poor-readiness profiles corresponding to social-emotional risk (27% of sample) or health risk (19% of sample). Children in the two poor-readiness profiles were more likely to be from socially and economically disadvantaged backgrounds than those in the positive profiles. Additionally, analyses of first-grade achievement as a function of readiness profiles across a variety of indices (e.g., reading, math, self-control) showed there to be significant repercussions for children with poor school readiness. Children in the two poor-readiness profiles had lower reading and math scores than those in the positive profiles and were rated by their teachers as having less self-control in the classroom.

Several subsequent studies have applied profile analyses to understand school readiness among children considered at-risk. Cabell and her colleagues investigated profiles of school readiness, focusing specifically on language and literacy skills, for children in targeted-enrollment preschool programs, the majority of whom came from low-income households (Cabell, Justice, Konold, & McGinty, 2011; Cabell et al., 2013). These studies showed children to be relatively stable with respect to their profiles from preschool through kindergarten, particularly for children in "at-risk" profiles. There is also some research investigating school readiness patterns in children with language impairment. Pentimonti et al. (2014) investigated profiles of school readiness for children with language impairment (LI), finding there to be four distinct profiles characterizing these youngsters. Children in two profiles (Socially Awkward – 19%; Limited Readiness – 14%) demonstrated patterns of readiness that were significantly weaker than the other groups. Interestingly, the quality of children's preschool experiences was strongly predictive of children's school-readiness profile membership: children were more likely to be in the optimal profile versus one of two at-risk profiles if their preschool classroom had high levels of instructional and emotional support (Pentimonti et al., 2014). The predictive potential of classroom quality as a contextual factor influencing school readiness profile membership is debated in the literature however. A recent examination of school-readiness profiles among participants in Head Start, which showed there to be four distinct profiles of readiness, linked classroom quality to profile membership (Halle et al., 2012), with higher classroom quality being associated with movement to a more strengths-based profile across the year. However, in another study utilizing the same sample (McWayne, Cheung, Wright, & Hahs-Vaughn, 2012), there was no association between classroom quality and profile membership/movement. One possible explanation for this lack of association as acknowledged by the authors is that "measures of individual teacher-student interaction (rather than general sensitivity measures) are needed" (p. 680, McWayne et al., 2012).

In the present study, we examined school readiness among rural, poor children residing in Appalachian communities, adding to the literature concerning development of children in rural settings (Byun,

Meece, Irvin, & Hutchins, 2012; Tichnor-Wagner, Garwood, Bratsch-Hines, & Vernon-Feagans, 2016; Vernon-Feagans & Cox, 2013). Appalachia is a large and significant generally rural region of the southeastern United States, with its 204,000 mile^2 transcending 13 states and including 25,000,000 inhabitants (Pollard & Jacobsen, 2012). Much of the Appalachian region is geographically isolated, given the mountainous nature of the topography, contributing in part to long-standing challenges regarding development of both infrastructure and industry.

The present study was conducted in small, rural communities across the Appalachian region of two states, and the children represented in the study were attending preschool programs targeting enrollment to low-income families. These circumstances provide an important and multi-faceted context in which to understand children's development, in this case their school readiness. Most research on school readiness to date has focused on children largely residing in urban and suburban settings (e.g., Winsler et al., 2008; Zhai, Brooks-Gunn, & Waldfogel, 2011), even though millions of children within the United States reside in rural settings. Further, the distinctness of rural and urban settings makes it unclear if findings based on suburban/urban children effectively generalize to rural children (Miller & Votruba-Drzal, 2013). For instance, Halle et al. (2012) examined profiles of school readiness for a national sample of Head Start participants. Of four profiles identified, 47% of children were in profiles exhibiting some facet of risk (cognitive risk profile = 38%; socioemotional risk profile = 9%), whereas 53% were in more advantageous profiles. It is questionable whether these results can generalize to preschoolers in rural settings, as recent work has suggested that rural preschoolers may lag behind their urban and suburban peers in key readiness skills (Miller & Votruba-Drzal, 2013).

Often, rurality is conceptualized based on its distinctiveness from urbanicity; in fact, government organizations define rural settings as those that are "not urban," with the rural/urban distinction based on the density of the population (Hall, Kaufman, & Ricketts, 2006). However, rural settings are not simply "non-urban" and are unique in several important ways. First, rural settings typically have elevated levels of poverty and economic depression compared to urban settings, largely reflecting shifts within the broader economy, such as movements towards 'clean energy' (leading to declines in the coal industry), transfer of local jobs to urban cores, and creation of the 24-h economy (Vernon-Feagans, Burchinal, & Mokrova, 2015). Jobs that are available tend to be low wage, and many adults, especially the less-educated, work nonstandard hours. Nearly one-half of rural children reside in poverty (Strange, Johnson, Showalter, & Klein, 2012) and many live in 'deep poverty' (O'Hare et al., 2013); less than one in five adults has a college degree (Byun, Meece, & Irvin, 2012).

Second, rural settings are, by their nature, relatively isolated and removed from the resources available within suburban and urban contexts. For instance, they may have limited access to health care, especially that which addresses specialized needs (e.g., treatment for extremely preterm birth), and state-of-the-art educational approaches and services (Guarino, Santibanez, & Daley, 2006). This extends to early care and education, with rural parents largely relying on home-based care options for their young children, due in part to limited access to quality center-based programs or inability to pay for such programs (Smith, 2006).

Although the rural context is often considered monolithically, there is variability within the schools and homes of rural children, and this variability appears associated with their academic development (De Marco, Vernon-Feagans, & Investigators, 2015; Tichnor-Wagner et al., 2016). For instance, Tichnor-Wagner and colleagues examined the home-literacy activities experienced by 1100 rural students, showing there to be significant variability among children in their access to literacy materials in the home and the extent to which they engaged in home-literacy activities. Importantly, this variability in home-literacy