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Screening for Social and Emotional Delays in Young Children Who Live in Poverty: A Brazilian Example

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Abstract

Emotional and social competence are notable predictors of future mental health outcomes. Studies have shown that poverty can negatively affect a child's development in several ways. In the Brazilian educational system, no direct payment is required to enroll children in public daycare centers. However, many daycare centers are in impoverished urban areas where the rates of violation of children's rights are still high. This situation is concerning because of the possible impact on children's development. The aim of this work was to investigate latent growth in 6,530 three- to four-year-old children who were enrolled in public daycare centers in the city of Rio de Janeiro in 2011 and 2012. We used a modified version of the Ages and Stages Questionnaire: Social and Emotional (ASQ:SE), in which 21 items across the questionnaires were retained. Latent Growth Modeling was performed by constraining intercepts of the repeated measures to one, and the slope's loadings corresponded to the study's time scale (in our case, 0 for age 3 and 1 for age 4). The intercept and slope results were significant (p<0.001) and positive, indicating variability in the individuals' starting points. Consistent with these results, the scores increased as the children got older. Our findings suggest that children who are enrolled in Brazilian public daycare centers are achieving the expected emotional or social milestones that are appropriate for their age.

Keywords: Child development; Longitudinal research; Latent growth modeling; Ages and stages questionnaires; Daycare centers; Psychometrics

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Introduction

Social and emotional domains are important predictors of mental health and the development of cognitive abilities and executive functions, including attention, working memory, and inhibitory control. Research suggests that deficits in emotion regulation and social competence are linked to greater levels of behavioral problems, difficulties with peers, and later psychopathology [1,2]. The development of both emotion regulation and social competence are also related to environmental characteristics [3].

In this direction, there is a vast international literature on the nature and extent of child poverty and a growing body of evidence on the consequences of child poverty: children who grow up in low-income environments face considerable barriers to healthy development and are more likely to be exposed to multiple environmental hazards, such as violence, crime, and drug abuse [4]. Low-income parents are often overwhelmed by reduced self-esteem, depression, and a sense of powerlessness and incapacity to cope—feelings that can get passed along to their children in the form of insufficient nurturing, negativity, and an overall failure to focus on children's needs [3].

In Brazil, a governmental program began in 2010-2012 to assess the development of children who were enrolled in public daycare centers, and during 2011 and 2012, emotional and social aspects of child development were also assessed [5]. In public daycare centers, because no direct payment is required, mostly children come from low-income/very poor families. This program was highly influenced by evidence from the United States, where evaluations of early childhood education programs demonstrated long-term impacts on a wide range of outcomes, including scholastic achievement, poverty, and criminal behavior.

The Brazilian program was unfortunately stopped in 2013, and few results are known about its outcomes [5]. That said, the present

study focuses on describing and discussing child development based on the results that were obtained during this period.

Material and Methods

The participants included a total of 6,530 children (52% boys and 48% girls) who were enrolled in 357 different daycare centers in Rio de Janeiro, Brazil. They were assessed by caregivers or teachers across 2 years (2011, when they were 3 years old; 2012, when they were 4 years old) using the Brazilian version of the Ages and Stages Questionnaires: Social and Emotional (ASQ:SE) [2]. More information about this procedure can be found in other publications [3].

We used 21 items across both 36- and 48-month ASQ:SE intervals to accommodate the ages of our preschool population. In the ASQ:SE traditional scoring system, higher scores indicate a risk for emotional and social problems. In this study, the system was reversed to reflect typical development. Because of that, we coded with "2" when participant checked the column of "Often or Always" for positive items or "Rarely or Never" for problematic items; "1", when the column "Sometimes" was checked; "0" when participant checked the column of "Rarely or Never" for positive items or "Often or Always" for problematic items (**Table 1**).

Ethical approval for this study was granted by the Ethical Committee of the Pontifical Catholic University of Rio de Janeiro. The data were analyzed using R 3.4 [6] and MPLUS V.8 [7] software.

Results and Discussion

To be able to describe and compare the results that were obtained with the ASQ:SE across time points and to avoid potential interpretation bias, we checked whether both versions that were used were statistically equivalent. We explored measurement invariance by verifying differences in practical fits, such as Confirmatory Fit Index (CFI) and Tucker Lewis Index (TLI) instead of checking a non-significant *p* value. According to the standard approach, the more constrained model is preferred only when the χ^2 test results in a nonsignificant *p* value ($p \geq 0.05$). The χ^2 value is inflated, however, when using large sample sizes [8] (**Table 2**).

As shown in **Table 2**, the results indicated longitudinal measurement equivalence. To assess changes in behavior as a function of the children's age, we performed Latent Growth Modeling. The intercept was constrained at one and the slope was constrained across time points (in our case, 0 for age 3 and 1 for age 4). Intercepts (initial status) and slopes (rate of change) are considered latent variables because they cannot be directly observed and represent aspects of change. Recent studies have shown that this approach is well suited to remove the effects of measurement error that might exist in predictors or outcomes [9].

The paths coefficients from both domains were: slope with intercept =0.035, p=0.019; slope mean =0.384, p<0.01; intercept variance =0.267, p<0.01, slope variance =0.059, p<0.01, (**Figure 1** presents the standardized results). Once the difference between the two-time points was significant, we decided to report raw scores to facilitate understanding of the results and to compute the Cohen's d effect size (**Table 3**).

All scores increased as the children got older. Females tended to have higher scores on all domains of the ASQ:SE. If we assumed that higher scores were associated with lower developmental risk for later social and emotional difficulty, then our findings are consistent with the literature [1,2].

Table 1 Twenty-one item ASQ:SE.

Domain	Content	Item (3 years)	Item (4 years)
Emotional	Child moves from one activity to the next	8	20
	Child settles down after exciting activity	7	7
	Child hurts self on purpose	22	23
	Child does what you ask	11	13
	Child cries, screams, or has tantrums for long periods	19	8
	Child tries to hurt other children	29	31
	Child calms down within 15 minutes	5	4
	Child destroys or damage things on purpose	24	25
	Child seems more active than other children of his/her age	12	16
	Child does things over and over and can't seem to stop	21	22
	Child sleeps at least 8 hours in a 24-hour period	16	15
	Child stays away from dangerous things	23	26
Social	Child can name a friend	26	27
	Child uses words to tell you what he/she wants	17	17
	Child uses words to describe his/her feelings	25	19
	Child plays/talk with adults he/she knows well	3	3
	Child is interested in things around her (people, toys)	10	9
	Child likes to play with other children	28	30
	Child looks at you when you talk	1	1
	Child seems happy	9	14
	Child likes to be hugged or cuddled	2	5

Table 2 Fit indices of measurement invariance.

	df	χ^2	$\Delta\chi^2$	χ^2 df	*p*	CFI	RMSEA	ΔCFI	ΔRMSEA
Configural	376	6136				.923	.048	NA	NA
Loadings	395	6439.8	104.295	19	< .001	.926	.046	.003	.002
Intercepts	414	6446.5	30.949	19	.04	.924	.046	.003	0
Means	416	6882.2	312.256	2	< .01	.918	.047	.005	.001

Table 3 Descriptive results and effect size (Cohen's *d*).

		Female (*n = 3,095*)	Male (*n = 3,435*)	
		M (SD)	**M (SD)**	***Effect size***
Emotional	3 years	21.4 (2.92)	20.5 (3.51)	0.28
	4 years	22.3 (2.44)	21.4 (3.27)	0.31
	Effect size	0.33	0.27	
Social	3 years	16.8 (2.07)	16.4 (2.44)	0.18
	4 years	17.3 (1.59)	17 (1.95)	0.17
	Effect size	0.27	0.27	
Total	3 years	38.2 (3.9)	36.9 (4.68)	0.30
	4 years	39.7 (3.18)	38.4 (4.25)	0.35
	Effect size	0.42	0.34	

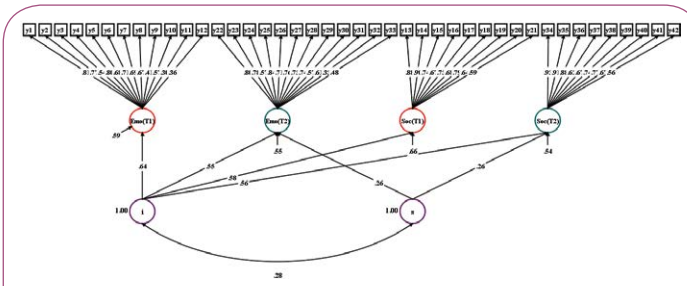

Figure 1 Standardized model results.

Other studies have shown that girls are, on average, more socially competent than boys. Externalizing behaviors (e.g., hyperactivity) are more common among boys than among girls. One explanation for this might lie in the fact that boys are more physically active, engage in more risk-taking behavior and rough-and-tumble play, and exhibit more anger and aggression toward peers than girls [10]. When adults, the odds of having a psychological condition are higher in women [11].

Conclusion

The purpose of present study was to describe and discuss child development using data gathered with Brazilian children enrolled in public daycare centers. We used a longitudinal version of ASQ:SE with 21 items across both 36 and 48-month and assessed the changes in behavior using a Latent Growth Modeling.

Two important features in our study are

1. the items used on ASQ:SE and
2. the social conditions of the Brazilian public daycares, where data were gathered.

First, since the items were the same, we could check the children's latent growth. Second, mostly of these children are growing up in low-income families, and because poverty is not exclusive to developing countries, our results can be useful for shedding light on child development in a challenging environment.

In our results, the intercept and slope variances were significant and positive, indicating variability in the individuals' starting points. In the same direction, the raw scores increased as the children got older. Our findings suggest that children who are enrolled in Brazilian public daycare centers are achieving the expected emotional or social milestones that are appropriate for their age. Despite growing up in low income households, these children appear to be gaining social and emotional competence and performing well in their preschool environments.

Although there are some limitations (e.g., observational design with no control group), we believe that these results can be generalized to similar populations who live in poverty. In similar direction, as long the evaluation of the quality of early care and education is part of political agenda and expand the current understanding of public services, this study is also relevant [4].

Longitudinal studies have long played a critically important role in developmental psychology and pediatric medicine, and these designs are becoming increasingly relevant to contemporary research. If researchers are able to estimate intra-individual patterns of changes over time, then they may better understand developmental trajectories of children and improve outcomes through early and targeted intervention.

Finally, we all agree that other studies are necessary to further document our findings, to address new questions about child development and to nurture an 'evidence-based policy-making' scenario using of statistics and statistical thinking throughout government decisions. Currently, new studies are being conducted to explore these issues.

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