Journal of Child & Adolescent Behavior

Martinez, et al., J Child Adolesc Behav 2015, 3:5
DOI: 10.4172/2375-4494.1000254

Research Article Open Access

Socioeconomic Status and Internalizing Symptoms in Chilean Children: Does Reserve Capacity Matter?

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Received date: Oct 02, 2015; **Accepted date:** Oct 14, 2015; **Published date:** Oct 21, 2015

Abstract

Informed by the reserve capacity model, we examined pathways between socioeconomic status (SES) and internalizing symptoms (IS) in 1119 Chilean 10-year-olds. Mediators included parental disciplinary style and reserve capacity resources (RCR), namely home environment, parent-child engagement, and self-esteem, and conduct problems. Using structural equation modeling, the model was stratified by gender. For boys, the SES-IS relationship was mediated by the home environment and parental disciplinary style. For girls, the SES-IS relationship was mediated by the home environment, parent-child engagement, self-esteem, and conduct problems. Findings suggest different RCR may protect against IS in a sample of Chilean children.

Keywords: Reserve capacity; Parental discipline; Internalizing symptoms; Conduct; Self-esteem; Socioeconomic status

Introduction

Children experience emotional issues characteristic of internalizing symptoms (IS) in both developing and developed countries [1,2]. Preadolescent girls and boys are affected equally, but during adolescence, girls experience more emotional problems than boys [3]. It is therefore important to understand the risk and protective factors for IS for boys and girls separately, particularly in developing countries. Moreover, developing countries in economic transition, such as Chile, are particularly vulnerable to depression compared with other developing and developed countries [4,5].

Chile has undergone dramatic socio-demographic and health changes in the last 40 years [6]. Life expectancy, maternal and infant mortality and malnutrition have improved [7], yet depression is one of the most commonly reported health conditions among Chileans [5], making it a public health priority especially among children [8].

In a study of adolescents (ages 13 to 15 years), Fleming and Jacobsen reported that 30% of a sample of Chilean adolescents reported feeling sad or hopeless every day in a 2-week period [9], which is similar U.S. incidence (26%) in a nationally representative sample of adolescents [10]. Despite the high prevalence of IS in Chilean youth, factors related to IS remain poorly understood in this population.

Socioeconomic status (SES) is a well-known social determinant of adult depression [11], yet research findings for children are inconsistent [12,13]. The impact of lower SES on IS among children may depend on contextual factors such as home-environmental attributes [14]. Furthermore, the quality of parenting and the parent-child relationship are known to be important and protective factors of children's IS [15].

The current study used the reserve capacity model (RCM; [16]) to help inform the pathways between SES and children's IS. The model articulates three processes underlying the relationship between social inequities and health disparities: (a) via stressful events, (b) through emotional and cognitive coping, and (c) by intermediate pathways that involve health behavior.

"Reserve capacity" is conceptualized as intrapersonal and interpersonal resources that mediate the relationship between stresses and one's positive coping ability. The model posits that individuals of low SES may experience more stress, and in turn be more emotionally reactive to stress due to their lower reserve capacity. In turn, intermediate health behaviors and functioning are impacted, which ultimately contributes to morbidity and mortality. Informed by empirical evidence, the three processes were adapted to examine mechanisms between SES and children's IS (Table 1).

Via stressful events

Children of lower SES may experience more stressors, conceptualized here as harsh disciplinary parenting [17,18], compared to those higher of SES. Low SES is associated with harsh parental discipline [19] and could be a precursor to depression or IS [20,21]. When parents experience economic hardship, their ability to use positive parental discipline is undermined, resulting in high levels of harsh discipline [22].

The importance of parents' disciplinary style for children's emotional and mental well-being is well established [23,24]. Parenting style and children's emotional and mental well-being may differ by gender [25], with studies showing that parents are less punitive with their daughters than their sons [26,27]. Just as parental discipline may differ depending on the child's gender, children's response to disciplinary styles might also vary by gender [28].

Socioeconomic status	Stress	Reserve capacity resources	Emotional and cognitive coping	Intermediate paths*	Health outcome
Maternal Education	Negative Parental disciplinary style	Parent-child engagement; Home environment	Self-esteem	Conduct problems	Depressive symptoms
*Intermediate paths as related to behavioral functioning in children.					

Table 1: Adapting the reserve capacity model for children's depressive symptoms.

Reserve capacity resources

The level of parent-child engagement and the home environment were conceptualized as a child's reserve capacity. These factors are associated with higher maternal education [19,29,30], a common proxy for SES. Home-environmental attributes (clean, uncluttered) are important for children's favorable developmental outcomes [31,32]. In contrast, a less optimal home environment has been shown to result in parent-child conflict and children's behavioral problems [33].

Through emotional and cognitive coping. Parent-child engagement may protect children from depression [21,34] as it is believed to impact both children's reactivity to stress and their cognitive and emotional coping ability [35]. Children's self-esteem was used as a proxy for positive emotional and cognitive coping.

Previous research suggests that parent-child engagement helps build children's self-esteem [36,37]. Others have also found that children's low self-esteem relates to children's emotional wellbeing [38,39], yet mediators of this relationship remain unclear. We examined (1) if the relationship between parent-child engagement and children's coping, behavioral functioning differed for boys and girls, and (2) whether the home environment and parent-child engagement mediated the relationship between SES and children's IS through children's emotional and cognitive coping.

By intermediate pathways that involve health behavior. Children's self-esteem may impact IS through intermediate paths related to children's behavioral functioning, such as the incidence of conduct problems [31]. Studies suggest that children who are more engaged with their parents [40,41] and have higher self-esteem [42] are less likely to have behavioral conduct problems [43], which is associated with lower risk for IS [39].

Thus, we postulated that children's conduct problems acted as a mediator between children's self-esteem and IS. The purpose of this study was to examine the simultaneous relationships between children's SES, home environment, parent-child engagement, and children's self-esteem, conduct problems, and IS in the sequence of the RCM to better understand the contextual origins of childhood depression in Chilean 10-year-olds. We hypothesized that: (1) higher SES would be related to less frequent IS through a less negative parental disciplinary style; (2) higher SES would be related to positive reserve capacity, and in turn would be related to less frequency of IS through a less negative parental disciplinary style, higher self-esteem and fewer conduct problems; and (3) the pathways linking SES to children's IS would differ by gender.

Method

Study population

The study sample included 1,119 10-year-old Chilean children and their mothers (or primary caregiver). Detailed description of infancy study methods have been previously described in detail [44]. Children and their mothers were participants in an ongoing longitudinal cohort study, which began as an iron-deficiency anemia (IDA) preventive trial in working-class urban communities of Santiago, Chile [44]. Participants were enrolled as infants between 1991 and 1996. Extensive data were collected on the developmental and behavioral outcomes and on family background, including maternal education in infancy and at a 10-year follow-up. Participants were assessed at the Institute of Nutrition and Food Technology (INTA), University of Chile. Data were obtained by research psychologists via interviewer-administered surveys, conducted separately for parent and child. For the purposes of this secondary data analysis, we included children with complete data for SES and IS. The current study was approved by the Institutional Review Boards at INTA, the University of Michigan, and the University of California, San Diego.

Measures

For the current study, we used cross-sectional data from the 10-year follow-up. Items from the Home Observation for Measurement of the Environment inventory (HOME) [45] and the Child Health and Illness Profile survey (CHIP) [46] were selected. The items from the HOME inventory are based on parental report whereas items from the CHIP survey are based on child report. Given that these measures were developed for the general population, confirmatory factor analysis (CFA) was used to identify which items explained the constructs as described in the RCM (Table 1). Study measures are presented below.

Maternal education

Mothers reported years of education completed (continuous variable).

Negative parental disciplinary style

Five items from the HOME scale assessed parental discipline. Each item had a no (0) or yes (1) response option, which was reverse coded, with yes representing a more negative disciplinary style. Using confirmatory factor analysis (CFA), we created a latent construct using three items (factor loadings ranged from 31-63): 'parent has not lost patience with the child', 'child was not physically punished more than once in the past month', and 'child is able to express negativity toward parents without severe consequences'. Items that did not load onto this

construct were ´child has a special place to keep belongings' and ´parent uses an endearing term to address child.´

Home environment

Eight items from the HOME inventory pertaining to the home's physical environment for nurturing. Items were based on parental report, with each item having a no (0) or yes (1) response option. Using CFA, we created a latent construct using eight items (factor loadings ranged from .40-.57). The items used to describe the home environment included attractiveness of the child's room, cleanliness, lighting, clean floors, structural safety of the home, surface area available per person, level of noise, and risk-free outside environment.

Parent-child engagement

Six items from the CHIP survey assessed the frequency of positive parent-child engagement, with response options ranging from no days (1) to every day (5). Using CFA, we created a latent construct using six items (factor loadings ranged from .32-.55): "How often do…", 1) 'you get along well with parents', 2) 'your parents listen to your ideas', 3) 'parents eat meals with you', 4) 'your parents spend time with you doing something fun', 5) 'you go to an adult with a problem', 6) 'you talk to your parents about the next day?'

Self-esteem

Five items from the CHIP survey assessed self-esteem, with response options ranging from never [1] to always [5]. Using CFA, we created a latent construct using five items (factor loadings ranged from .49-.70): 'h/o do you like yourself,' 'how often do you feel happy,' 'h/o are you proud of yourself,' 'h/o do you feel loved and wanted,' and 'h/o do you like the way you look?"

Conduct problems

Six items from the CHIP survey assessed poor behavioral functioning, with response options ranging from never (1) to always (5). Using CFA, we created a latent construct using six items (factor loadings ranged from .38-.58): 'h/o do you get in trouble,' 'h/o do you pick on other kids,' 'h/o do you hang around troublemakers,' 'h/o do you try to get away with rule-breaking,' 'h/o do you try to do something dangerous' and 'h/o have you told someone that you will hurt them."

Children's internalizing symptoms (IS)

Mood, anxiety and emotional wellbeing were assessed by 6 of 11 items identified in the CHIP survey, with response options ranging from never (1) to always (5). Items did not equate with a validated depression risk scale, but have been used to assess emotional-related quality of life such as IS. Using CFA, we created a latent construct using six items (factor loadings ranged from .37-.65): 'h/o are you sad,' 'h/o do you cry,' 'h/o do you worry,' 'h/o are you grouchy,' 'h/o are you afraid', and 'h/o are you too sick to play?' The five items that did not load onto this construct included somatic complaints such as sore throat, stomachache, and pain.

Demographics

Birthdate and sex were obtained through medical records in infancy. Mothers' birthdate was obtained by parent report. Child's age was used to describe our participant sample, but was not included in the main analysis as there was little variability.

Covariates

We examined iron assignment and IDA during infancy as possible covariates, since participants were originally part of an IDA preventive trial, and maternal depression risk, measured by CES-D at the 10-year wave, as a child stress factor.

Analytic plan

We used PASW (Version 18; Chicago, IL) for descriptive statistics. Latent constructs were estimated using CFA. CFA and structural equation models were estimated using MPlus software. Overall model fit was assessed using the following fit indices: confirmatory fit index (CFI ≤ .90), root mean square error of approximation (RMSEA approximating .06) and standardized root mean square residual (SRMR ≤ .08) [47,48]. Pathways were considered significant at $t>1.96$ (equivalent to $p<0.05$). The full information maximum likelihood function was used to account for missing data. We first tested the model for the full sample and then used multiple group analysis to examine gender differences.

Results

Participant characteristics are displayed in Table 2. Only conduct problems differed by gender: 15% of boys vs. 11% of girls reported "almost always" or "always" reported getting into trouble ($p<0.05$). Overall 15% reported that they "almost always" or "always" experienced IS.

Maternal	%	Boys	Girls
Mean age (SD)	36.3 (6.0)	36.4 (6.1)	36.3 (5.9)
Mean education (SD)	9.4 (2.7)	9.4 (2.7)	9.5 (2.5)
≥12 years education	31.7	30.8	33.6
Optimal home environment†	38.7	40.0	37.2
Negative parental disciplinary style†	20.7	22.0	19.2
Almost every day/every day	52.0	63.1	65.5

parent-child engagement‡			
Child			
Mean age	10.0 (0.1)	10.0 (0.1)	10.0 (0.1)
Gender	--	55	45
Almost always/always had depressive symptoms‡	15.0	15.0	15.1
Almost always/always had self-esteem‡	74.6	73.4	76.1
Almost always/always had conduct problems‡	13.5	14.9	10.5
Very good/excellent school performance	50.2	50.6	49.8
†Mean prevalence of parents who responded yes on items about a home environment (8 items) and parental disciplinary style (3 items) ‡Mean prevalence of children's responses to items on parent-child engagement, depressive symptoms (6 items), self-esteem (5 items), conduct problems (6 items) and school performance (4 items)			

Table 2: Descriptive characteristics of Chilean 10-yr olds (N=1119).

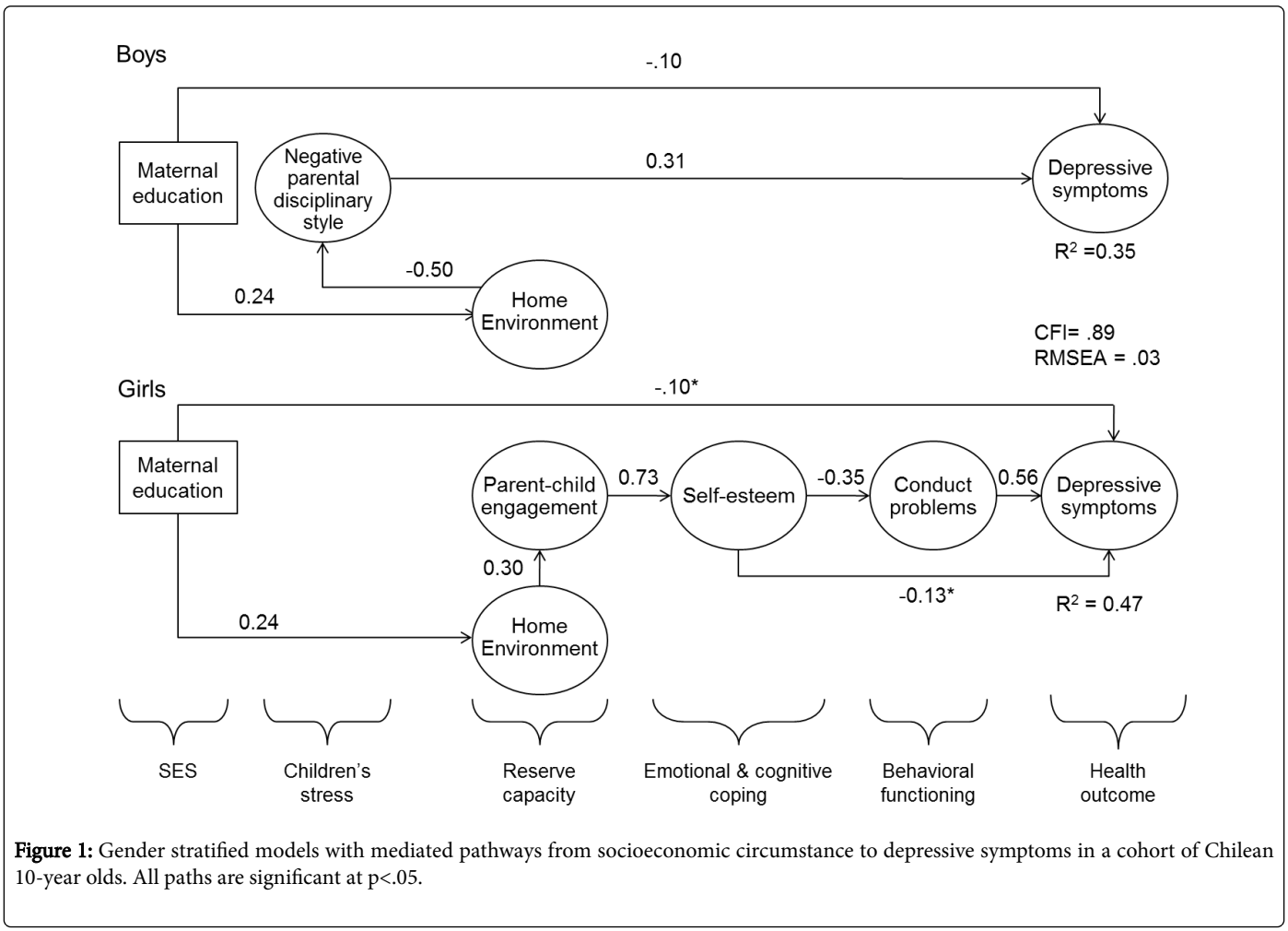

Figure 1: Gender stratified models with mediated pathways from socioeconomic circumstance to depressive symptoms in a cohort of Chilean 10-year olds. All paths are significant at p<.05.

Structural equation model

The a priori multiple group analysis model fit the data well (CFI=. 89, RMSEA=.03). As hypothesized, SES showed a negative and indirect path to IS in boys and girls, but through different mechanisms. We present the gender stratified model (Figure 1) as we were interested in gender differences.

For boys, SES was negatively and indirectly related to IS through a nurturing home environment and harsh parental discipline. As hypothesized, higher SES related to a more positive home environment

(B=.24, p<.001). In turn, a more positive home environment was related to a less negative parental disciplinary style (B=.50, p<.001), which related to more frequent IS (B=.31, p<.001). The model explained 35% of the variance in boys' IS.

For girls, SES was indirectly related to IS through the presence or absence of reserve capacity resources. As hypothesized, higher SES was positively associated with a more positive home environment (B=.24, p=.01), which in turn, was related to greater parent-child engagement (B=.30, p=.01). Greater parent-child engagement was related to girls' higher self-esteem (B= .73, p<.001), which related to less frequent conduct problems (B=-.35, p<.01). More frequent conduct problems were related to more frequent IS (B=.56, p<.001). Self-esteem was directly, but marginally related to less frequent IS (B=-.13, p=.05). The model explained 47% of the variance for girls' IS.

For boys and girls, higher maternal education was directly related to less frequent IS (B=-.10, p<.001; B=-.10, p=.06; respectively). Neither iron assignment, IDA during infancy, maternal age nor maternal depression significantly related to IS. These covariates were excluded from the analysis for more parsimonious models.

Discussion

The current study analyzed the role of SES in childhood IS in a large cohort of Chilean 10-year olds of low- to middle-income backgrounds. In our sample, higher SES directly related to lower risk for IS, and lower SES related to IS through processes involving reserve capacity that differed by gender. For boys, SES related to IS through the home environment for nurturing and less harsh parental discipline, sequentially. For girls, SES related to IS through home environment, parental engagement, self-esteem and conduct problems, sequentially. The key findings are presented in the sequence of the reserve capacity model.

SES matters for children's socioemotional adjustment [31], which our findings support. SES also matters for parents' harsh disciplinary practices [24], yet our findings did not support this relationship. Our sample was of low to middle income and therefore the narrow range of may have limited our ability to detect a relationship.

We found an indirect relationship between SES and children's IS. Higher SES was linked with a more optimal home environment for boys and girls. Interestingly, though, harsh parenting was related to IS for boys only, and an indirect relationship surfaced for boys between lower SES and parents' harsher parenting by way of a less nurturing home environment. This may reflect the fact that mothers who were able to provide a more nurturing home atmosphere were less likely to engage in harsh disciplinary practices. Lower SES mothers may have been more reactive to a less nurturing and disorderly home atmosphere, and in this way, more likely to use harsh discipline with their sons. Long term, undue stress for mothers resulting from life in lower SES settings may hinder mothers' ability to provide hands-on, authoritative, and nurturing parenting [22]. Parenting stress has been postulated as one possible mediator between SES and favorable child development [18,49]. Our study validates this mechanism in Chilean boys, but not girls. Perhaps mothers parented their daughters differently [46,47] or girls reacted differently to harsh discipline [48,49].

As expected, higher SES related to a more nurturing home environment. In turn, the home environment related to more engaged parent-child relations for girls only. Both home environment and parent-child engagement mediated the pathway between SES and IS and thus appear to be protective factors against IS for girls. Parent-child engagement was not related to harsh parenting but, rather, was strongly related to girls' feelings of self-esteem. This pattern is similar to that found in U.S. girls, with family economic stress negatively affecting adolescent girls' adjustment through less nurturing and less involved parenting [50]. While the association between self-esteem and family relationships has been observed during adolescence in boys and girls [51,52], others have that it is stronger for girls [53]. Girls place more emphasis on relationships than boys [54], making it is possible that positive parent-child interactions are more central to girls' self-esteem. In our sample, girls who reported engaging with their parents on most days might have had more opportunity to receive parental support and approval, which promoted greater self-esteem [20].

For girls, children's emotional and cognitive coping/self-esteem and behavioral functioning/conduct problems were found to mediate the relationship between parent-child engagement and IS among girls in our sample, but not boys. To our knowledge, there are no published studies of this pathway from self-esteem to IS in early and middle childhood. While similar pathways between other parenting factors and IS have been observed in both boys and girls [55], we found similar associations between parent relationships, self-esteem and IS in girls only. It could be that parent-child engagement does not affect boys' self-esteem or emotional adjustment in the same way as girls, particularly when accounting for parental discipline [56].

Unlike Kim and Cicchetti, we only found a marginally significant relationship between self-esteem and IS in girls [57]. This finding suggests that boys and girls follow different developmental pathways in terms of coping mechanisms, particularly when considering reserve capacity resources. Also, internalizing problems differ by gender, with girls being more prone to depression beginning in adolescence [58]. Conduct problems are generally correlated with internalizing behavior among youth [59]. Our finding echoes this relationship and suggests that low self-esteem may be a precursor to poor behavioral functioning, and in turn, may be a risk factor for IS in Chilean girls [60].

Interpretation and generalizability of these findings may be limited, as participants were of low- to middle-income backgrounds. Other findings may have emerged if our sample included upper-income families. This was a cross-sectional study; therefore, we cannot make inferences about temporal precedence or causality. Third, parental discipline was based on maternal report, based on their perceptions, which may be different than what would be reported by their children or fathers. Lastly, our data were limited to IS as opposed to a validated depression risk scale or diagnostic criteria. Nonetheless, childhood IS should be a priority as it is a precursor to later depression [61] and the lack of categorical distinction between clinical depression and other degrees of IS [62].

Despite these limitations, the current study has several strengths. This is the first application of the RCM in children, in both developed and developing countries. Findings provide a comprehensive description of the mechanisms linking SES to child emotional wellbeing. Given the high rates of depression and rapid economic transition experienced in Chile, our results are timely. Additionally, the large sample size allowed us to examine a range of factors related to IS by gender.

These findings describe how SES may contribute to children's IS differently among boys and girls, particularly in countries that have undergone rapid economic change. Given our findings here, it would be important for future research to examine gender differences in the links between children's self-esteem, conduct problems, and emotional wellbeing. Future studies are needed to corroborate whether these pathways are present for children in other contexts, especially in countries, such as Chile, where depression is common. Likewise, longitudinal studies should be used to consider age and development more carefully, since contextual factors such as parent-child engagement and parents' disciplinary tactics may change with children's development [63]. Further studies of the RCM would be strengthened by using a longitudinal design to test the across-time relationships outlined in this framework.

Acknowledgements

The authors are especially grateful for the careful review made by Dr. Patricia East, the support of Estela Blanco, as well as the ongoing participation of the participants.

Funding

This research was funded by grants from the National Heart, Lung, and Blood Institute and the National Institute of Child Health & Human Development (1R01HL088530, PI: Gahagan; R01HD14122, PI: Lozoff).

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