Continuity of behavioral and emotional problems from pre-school years to pre-adolescence in a developing country

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Background: All previous longitudinal community studies assessing the continuity of child behavioral/emotional problems were conducted in developed countries. **Method:** Six hundred and one children randomly selected from a Brazilian birth cohort were evaluated for behavioral/emotional problems through mother interview at 4 and 12 years with the same standard procedure – Child Behavior Checklist (CBCL). **Results:** CBCL Total Problem score presented a *medium* stability ($r = .42$) with externalizing problems showing higher stability and more homotypic continuity than internalizing problems. Of the children presenting deviant scores at the age of 4, only 31% remained deviant at the age of 12 ($p < .001$). A *deviant* CBCL Total Problem score at 12 years old was predicted by Rule-Breaking Behavior [OR = 7.46, 95% CI 2.76–20.19] and Social Problems [OR = 3.56, 95% CI 1.36–9.30] scores at 4 years of age. Either Rule-Breaking or Aggressive Behavior – externalizing syndromes – were part of the predictors for the three broad-band CBCL scores and six out of the eight CBCL syndromes. **Conclusions:** Behavioral/emotional problems in preschool children persist moderately up to pre-adolescence in a community sample. Externalizing problems at the age of 4 comprise the developmental history of most behavioral/emotional problems at pre-adolescence. Our findings concur with findings from developed countries and are quite similar for continuity, stability and predictability. **Keywords:** Behavior problems, continuity, longitudinal studies, Third World children, child development, externalizing disorders.

Typical child development is characterized by stability, but it also involves behavioral changes and reorganizations (Piaget, 1970). Similarly, the atypical development may present continuities and discontinuities throughout the life cycle (Rutter, Kim-Cohen, & Maughan, 2006). There is evidence that symptom patterns change as individuals get older – including diagnostic categories – what is also known as heterotypic continuity or sequential comorbidity (Angold, Costello, & Erkanli, 1999). This may be caused by changes in expressions of biological development, cognitive level, social status, duration and type of experiences (Rutter, 1988).

Evidence of continuity between child and adult psychopathology has been revealed by studies using clinical samples and retrospective methods. It has also been found in prospective studies and investigations using *random samples* from birth cohorts (Colman & Jones, 2004; Feehan, McGee, & Williams, 1993). Prospective studies have demonstrated that the origin of many adult mental disorders can be found in behavioral characteristics present since the first years of life (Caspi, Moffitt, Newman, & Silva, 1996; Maughan & Kim-Cohen, 2005) and that externalizing problems are the strongest predictors

of disorders in adulthood (Hofstra, van der Ende, & Verhulst, 2002).

Prospective studies on psychiatric disorders in children and adolescents also have shown that between 23% and 61% of children who had received a positive diagnosis at any follow-up point were diagnosed as having psychiatric disorders, although not necessarily the same one, in the next follow-up (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003). *Medium* stability of behavioral/emotional problems in children and adolescents assessed with the Child Behavior Checklist (CBCL; Achenbach, 1991) has also been found in *longitudinal community studies*. The correlation coefficient between the Total Problems scores at different time points ranged between .58 (McConaughy, Stanger, & Achenbach, 1992) and .56 (Verhulst & van der Ende, 1995) in follow-ups with time intervals of 3 and 6 years, respectively. Stability was lower when the time intervals between the assessments were longer. For example, Verhulst and van der Ende (1995) found coefficients of .40 for girls and .42 for boys with initial ages from 4 to 6 years old in an 8-year time interval assessment. Finally, externalizing problems had higher stability than the internalizing problems.

It is important to note that all previous longitudinal studies assessing the continuity of behavioral/

emotional problems were conducted in developed countries in North America (McConaughy et al., 1992), Europe (Verhulst & van der Ende, 1995), and Oceania (Feehan et al., 1993; Fergusson, Horwood, & Ridder, 2005).

Since it is well established that cultural background and poor environmental conditions might have an impact on different aspects of mental health disorders (Wadsworth & Achenbach, 2005; Weisz, Weiss, Suwanlert, & Chaiyasit, 2006), it is important to assess the continuity of psychopathology in samples from developing countries. Although a worse outcome might be expected for children suffering from mental disorders in these countries due to the amount of environmental risk factors (see Belfer & Rohde, 2005), recent evidence showed that: 1) prevalence of mental disorders in non-referred samples of children and adolescents in some areas of Brazil and India is at the same range as those found in developed countries (Fleitlich-Bilyk & Goodman, 2004; Hackett, Hackett, Bhakta, & Gowers, 1999; Rohde et al., 1999); 2) psychosocial determinants of child mental disorders in the same samples are quite similar to those detected in developed countries (Goodman, Fleitlich-Bilyk, Patel, & Goodman, 2007; Hackett et al., 1999); 3) clinical data on several aspects of attention-deficit/hyperactivity disorder (ADHD) and CBCL profiles are also similar between Brazilian samples and both North American and European samples (Roessner, Becker, Rothenberger, Rohde, & Banachewski, in press).

This study reports the follow-up of a community sample of Brazilian children assessed with the CBCL at 4 years old and again at 12 years old who took part in the 1993 Brazilian Birth Cohort Study (Boseley, 2007; Victora et al., 2006). The objective of this study was to test the continuity of behavioral/emotional problems between pre-school age and pre-adolescence, as well as to determine which CBCL syndromes scores at 4 years can predict behavioral/emotional problems at 12 years. Based on the findings showing similar prevalence and psychosocial determinants of child mental disorders in non-referred samples, as well as similar CBCL and ADHD profiles in clinical samples from Brazil to those detected in developed countries, our main hypotheses were: a) a similar degree of continuity of behavioral and emotional problems to the one detected in samples from developed countries where individuals were assessed at the same interval would be detected; b) a similar profile of CBCL syndromes predicting behavioral/emotional problems 8 years later would also be found.

Methods

Sampling procedures

Mothers of 314 girls and 287 boys took part in the present study. These mothers participated in the Pelo-

tas 1993 Birth Cohort Study, see Victora et al. (2006) for details. The results of the cross-sectional assessment at 4 years old were previously described (Anselmi, Piccinini, Barros, & Lopes, 2004).

In short, during 1993 interviewers paid daily visits to all five maternity hospitals in the city; *there are virtually no home deliveries in the city* (*less than 1%*). Pelotas currently has 320,000 urban inhabitants and is located in Southern Brazil, near the Uruguayan border. Mothers of 5,249 live newborns and 55 stillborns were interviewed. Subsamples were followed at 1, 3, 6, and 12 months of life, including all infants with low birth weight (LBW < 2,500 g).

When the children turned 4 years old, all mothers who participated in the follow-up at 12 months were searched for and 1,273 (96.3% of 1,363) were found. Half of this subsample was then selected through a systematic sampling to take part in the Anselmi et al. (2004) study (Figure 1). Only one child was lost (due to residential mobility) and there was just one refusal. Therefore, the final size of the sample was 634 children. During this phase of the study, the mothers answered the CBCL regarding their children, as well as other instruments.

From March to June 2005 (the year in which the children turned 12 years old), another home visit was conducted to re-administer the CBCL to the same 634 mothers. We were able to find 601 (95%) mothers who were then interviewed by a team of psychologists. Only 11 mothers answered the CBCL by telephone, because they lived in another city. Reasons for sample loss were: three deaths of children, five refusals, eight mothers were not found, and 17 moved to towns with poor road conditions and without telephone access.

We double-checked all data entry using the CBCL software (Achenbach, 1991) and the Epi-Info software (CDC, 2001). A brief version of the CBCL was re-administered by telephone to a subset of 5% randomly selected mothers in order to check the quality of data collection. The research project was approved by the Research Ethics Committee of the School of Medicine of the Federal University of Pelotas. Mothers provided written informed consent to participate and
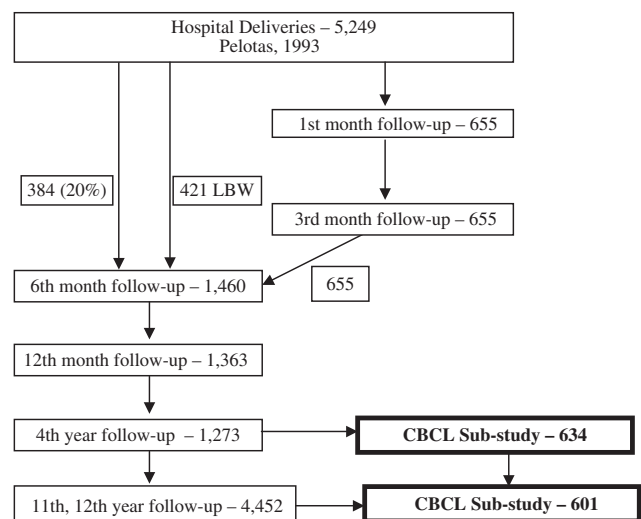

Figure 1 Sample selection

children of those mothers who asked for psychological treatment were referred to the outpatient mental health clinic at the School of Medicine of the university.

Instrument

The Child Behavior Checklist (CBCL). The empirically derived Child Behavior Checklist (Achenbach, 1991) is one of the best-studied instruments for the evaluation of children's and adolescents' psychopathology. It has been translated into more than 75 languages and used in systematic investigations in various settings and different cultures worldwide (Bird, 1996). Cross-cultural comparisons of the CBCL Total Problems scores, as well as scores on specific scales, revealed remarkable similarities regarding overall psychopathology (Crijnen, Achenbach, & Verhulst, 1999; Heubeck, 2000). The 118 behavioral and emotional items are scored by parents. A profile of childhood psychological problems displays scores on eight empirically derived scales: Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Aggressive Behavior and Rule-Breaking Behavior (earlier called Delinquent Behavior). Data from these scales are grouped in two broader dimensions (Internalizing and Externalizing Problems) and in an overall score (Total Problems). Several studies have supported the instrument's psychometric properties, showing good reliability and validity in both clinical and non-clinical populations. Its concurrent validity has been supported in Brazilian children (Bordin, Mari, & Caeiro, 1995).

Statistical analyses

Changes in mean scores: to perform descriptive analyses, we calculated mean and standard-deviation (SD) of the CBCL raw scores – Total Problems, Internalizing, Externalizing, and its eight syndromes – at 4 and 12 years old. In addition, we performed repeated-measure ANOVA to detect significant differences between scores at T1 (4 years) and T2 (12 years). Effects sizes were categorized according to Cohen's suggestion: eta square <.06 = small; .06–.14 = medium, >.14 = large effect size (Cohen, 1988).

Continuity: in order to analyze the stability of behavioral/emotional problems, Pearson's correlation coefficient was calculated for CBCL raw scores – Total Problems, Internalizing, Externalizing, and its eight syndromes – at 4 and 12 years old. We used Cohen's (1988) criteria to evaluate the magnitude of Pearson's correlation coefficients: small ($r = .10$–.29), *medium* ($r = .30$–.49), or *large* ($r \geq .50$).

Percentage of deviant children from 4 to 12 years old: to assess the persistence of the most deviant scores, we divided the CBCL – Total Problems raw scores into three groups. The cutoff points used were those recommended by Achenbach (1991) and implemented by several authors with the purpose of comparing results (Ferdinand & Verhulst, 1995; Verhulst & van der Ende, 1992). A deviant group included children who scored higher than the 90th percentile (P > 90) of the cumulative frequency distribution. A normal group (percentile lower than 50 – P < 50) and a non-clinical group (between the 50th and 90th percentiles) were also

defined. We performed the chi-square test to detect significant differences between scores at T1 and T2.

Predictors: to determine whether children who had deviant scores on CBCL syndromes at 4 years were at a higher risk of having deviant scores at 12 years, step-wise logistic regression analyses with a forward strategy were performed using the eight dichotomized CBCL syndromes (scores ≥ 2 SD = case; scores < 2 SD = control), the child's sex and family *income at 4 years of age* as predictors. Family income was calculated by asking the mother the amount of money earned by all those in the family who were working in the month before the interview. This variable was then transformed into monthly 'minimum wages' units in five categories (Victora et al., 1996). Regression analyses were carried out for each outcome score of the CBCL at 12 years: Total Problems, Internalizing, Externalizing and the eight CBCL syndromes, all of them dichotomized (≥2 standard-deviations). As a case criterion, we used 2 or more SD above the mean, since previous studies used similar strategies (see Wadsworth & Achenbach, 2005). *As a guide to interpretation, an Odds Ratio (OR) > 1.0 indicates that the variable is associated with an increased risk of poor mental health. Conversely, an OR < 1.0 indicates that the variable is associated with a decreased risk of poor mental health (i.e., a protective factor).* One must also bear in mind that, as with relative risks, the confidence interval of an odds ratio equal to one indicates no association between exposure and outcome (Lilienfeld & Stolley, 1994). The significance level accepted was .05. The statistical tests were performed with SPSS-version 13.0.

Results

Changes in mean scores: we detected a significant decrease of CBCL Total Problems and Externalizing means scores during the follow-up ($p < .001$) (see Table 1). The effect sizes associated with score reductions for both behavioral syndromes – Aggressive Behavior and Rule-Breaking Behavior – were moderate. There was no significant difference in Internalizing mean raw score between baseline and reassessment. *There were increasing mean scores for Social Problems and Withdrawn syndrome scales and decreasing mean scores for Thought Problems syndrome, but were of small magnitude* (see Table 1).

Continuity: the correlation coefficients were *medium*, although significant ($p < .01$) for the three broad-band scores — Total Problems, Externalizing and Internalizing (Table 2). Among the eight CBCL syndromes, those with the highest correlations were Aggressive Behavior ($r = .39$) and Attention Problems ($r = .37$). For syndromes related to emotional problems, the coefficients were lower, although yet significant.

Percentage of deviant children from 4 to 12 years old: we detected a significant change in child's categorization based on CBCL Total Problems scores (deviant, non-clinical, and normal) between 4 and 12 years ($\chi^2 = 91.16$; d.f. = 4; $p < .001$). Of the 58 children with deviant Total Problems score (P > 90)

Table 1 CBCL mean scores

CBCL scales	4 years Mean (±SD)	12 years Mean (±SD)	p-value	Effect size (eta square)
Total Problems	28.74 (17.39)	24.03 (16.55)	<.001	.06
Internalizing	6.15 (5.08)	6.56 (5.78)	.06	.01
Externalizing	12.56 (8.11)	9.34 (7.21)	<.001	.13
Withdrawn	2.45 (2.26)	2.83 (3.61)	.006	.01
Somatic Complaints	.60 (1,17)	.70 (1.31)	.112	.00
Anxious/Depressed	3.12 (2.88)	3.24 (3.36)	.413	.00
Social Problems	1.85 (1.66)	2.04 (2.05)	.019	.01
Thought Problems	.40 (.85)	.29 (.79)	.008	.01
Attention Problems	3.42 (2.74)	3.44 (3.25)	.740	.00
Rule-Breaking Behavior	2.40 (2.25)	1.75 (1.90)	<.001	.07
Aggressive Behavior	9.96 (6.70)	7.59 (5.91)	<.001	.10

Table 2 Correlation between CBCL scores at 4 and 12 years (N = 601)

CBCL scales	Correlation (r)
Total Problems	.42
Internalizing	.35
Externalizing	.42
Withdrawn	.25
Somatic Complaints	.18
Anxious/Depressed	.29
Social Problems	.25
Thought Problems	.22
Attention Problems	.37
Rule-Breaking Behavior	.31
Aggressive Behavior	.39

$P \leq .01$ for all correlations.

at 4 years, 18 (31%) had deviant scores at 12 years, while 28 (43.3%) were in a non-clinical group (P 50–90) and 12 (20.7%) obtained normal scores at 12 years old (P < 50). Of the 296 children who had normal score (P < 50) at 4 years, 208 (70.2%) remained in the normal range at 12 years, while 74 (25%) were in the non-clinical range and only 14 (4.7%) children were in the deviant range (P > 90) at 12 years. Regarding the whole sample, 2.8% (N = 18) of the children had deviant scores at both assessments, while 34.6% (N = 208) had normal scores at both assessments.

Predictors: for those whose 4-year scores syndromes significantly predicted outcomes at 12 years, we found odds ratios ranging from 2.49 to 8.71 for associations between deviant scores at 4 and 12 years (Table 3). The Total Problems score at 12 years was predicted by Rule-Breaking Behavior [OR = 7.46] and Social Problems [OR = 3.56]. The Rule-Breaking Behavior syndrome was a predictor for the Externalizing dimension [OR = 5.90] as well as family income [OR = .72]. On the other hand, the Internalizing dimension had Aggressive Behavior and Somatic Complaints as syndromes predictors [respectively, OR = 3.37, and OR = 3.70] as well as family income [OR = .68]. Preadolescents with higher family income at 4 years of age showed lower

risk of having Internalizing and Externalizing Behavior at 12 years old.

Externalizing problems – Rule-Breaking or Aggressive Behavior – were part of the predictors for all three broad-band scales – Total Problems, Externalizing, and Internalizing (see Table 3). Attention Problems, Rule-Breaking Behavior, Aggressive Behavior, Thought Problems, Externalizing and CBCL Total Problem scores at 12 years were predicted by Rule-Breaking Behavior at 4 years.

Male individuals were at a higher risk of having Rule-Breaking Behavior and Attention Problems (see Table 3). Scores in two broad-band scales (Externalizing and Internalizing) and one *syndrome scale* (Attention Problems) at 12 years old were associated to family income (SES) at 4 years old.

Discussion

In this longitudinal study assessing the continuity of behavioral/emotional problems in a developing country, we were able to detect a significant decrease of CBCL Total Problems scale of moderate magnitude during the study, as well as *medium* correlation of the three CBCL broad-band scores between baseline and reassessment. A significant proportion of children with deviant scores at 4 years of age migrated *to* non-clinical or normal categories at 12 years of age. In addition, externalizing problems scores at 4 years – Rule-Breaking or Aggressive Behavior – were part of the predictors for all three broad-band scales at 12 years.

Our findings documenting a significant decrease of scores in the CBCL Total Problems scale concur with previous investigations in the field. Verhulst and van der Ende (1995) conducted an 8-year Dutch follow-up also based on CBCL scores with children at 4–6 years of age at baseline. They found a decrease in CBCL Total Problems mean score according to parents' reports of the same magnitude as ours (about 4 points). In addition, similarly to our findings, Aggressive Behavior scores also presented the highest correlation and the most important decrease

Table 3 Predictors of deviant CBCL scores at 12 years

CBCL at 12 years (Odds Ratios)

CBCL at 4 years	Withdrawn	Somatic Complaints	Anxious/ Depressed	Social Problems	Thought Problems	Attention Problems	Rule- Breaking Behavior	Aggressive Behavior	Total Problems	Internalizing	Externalizing
Withdrawn	–	–	–	–	–	–	–	–	–	–	–
Somatic Complaints	–	2.72 (1.07–6.90)	–	–	–	–	–	–	–	3.70 (1.28–10.79)	–
Anxious/Depressed	–	–	–	–	–	–	–	–	–	–	–
Social Problems	–	2.66 (1.11–6.39)	–	–	–	–	–	–	3.56 (1.36–9.30)	–	–
Thought Problems	8.30 (2.96–23.76)	–	–	–	5.57 (2.22–13.93)	–	–	–	–	–	–
Attention Problems	–	–	–	–	–	–	–	–	–	–	–
Rule-Breaking Behavior	–	–	–	–	9.96 (3.46–28.69)	6.28 (2.08–18.97)	7.56 (2.48–22.99)	6.03 (2.23–16.29)	7.46 (2.76–20.19)	–	5.90 (2.16–16.11)
Aggressive Behavior	–	–	6.52 (2.40–17.71)	4.49 (1.69–11.92)	–	–	–	–	–	3.37 (1.04–10.89)	–
Sex	–	–	–	–	–	2.34 (1.05–5.24)	3.59 (1.39–9.33)	–	–	–	–
SES	–	–	–	–	–	.57 (.39–.84)	–	–	–	.68 (.47–.98)	.72 (.52–.96)

Notes: SES = socioeconomic stratum; Odds ratios estimated with 95% Confidence Intervals from logistic regression analyses. Only those significant ($p < .05$) were present.

during the follow-up. In another follow-up of North American children aged 9 years at baseline and assessed annually for 8 years, Costello et al. (2003) also found a decrease in the prevalence of psychiatric disorders at 12 years old. The authors concluded that it was due to the fact that the early childhood disorders might have disappeared in this period of transition. These similar changes in psychopathological profiles of cohorts from different countries seem to show a developmental effect of age in the evolution of behavioral/emotional problems that might not be explained based only on cultural differences.

The results from the present study also revealed that the CBCL scores showed a significant continuity for some behavioral/emotional problems in the transition from childhood to early adolescence. Even though the magnitude of the correlations in Total Problems, Externalizing, and Internalizing scores was *medium* between age 4 and age 12, it is important to note the long time lag between the two assessments and the very young age of the subjects at baseline. Although most studies investigating the correlations between psychopathology throughout the life cycle started in the middle or at the end of childhood (Maughan & Kim-Cohen, 2005) and included both children and adolescents, our results are very similar to other international studies (Ferdinand & Verhulst, 1995; Verhulst & van der Ende, 1995).

As expected, scores on the Externalizing dimension yielded higher correlations than those on the Internalizing dimension. Higher stability for externalizing problems throughout the life cycle has been widely discussed in the literature (Hofstra, van der Ende, & Verhulst, 2000; McConaughy et al., 1992; Verhulst & van der Ende, 1995) and some authors have considered that such stability is caused by common influences – both genetic and environmental – in disruptive behaviors (Fergusson et al., 2005). Another possible explanation would be that aggressive children get more attention from their parents at all ages and the sensitivity of these parents as observers can lead to an apparent stability of behavior throughout time. Although our study was not designed to assess reasons of continuity/ discontinuity of child psychopathology, we have anticipated a certain level of stability, since there was no reason to expect that levels of environment risk factors had changed substantially during the follow-up. For example, in a previous birth cohort study in the same city, nearly 70% of the families remained at the same SES category in a follow-up of 19 years, between 1982 and 2001(Barros et al., 2006).

The percentage of deviant children at 4 years who were deviant at 12 years (31%) was also similar to the results of other longitudinal studies with community samples that used the CBCL with the same cutoff point for the CBCL Total Problems score

(P > 90). In a follow-up comprising 936 Dutch children at initial age from 4 to 11 years old, Verhulst and van der Ende (1992) found that 33% of the children assessed remained deviant 6 years later. The same study found that 39% of the children remained deviant 8 years later (Verhulst & van der Ende, 1995), although the cutoff point was changed to the 85th percentile in the last follow-up. When Ferdinand and Verhulst (1995) followed 459 Dutch children and adolescents for 8 years, they found that 27.3% of them continued to have deviant scores.

Approximately two-thirds of the children identified as deviant at 4 years showed some improvement, even though such improvement was mild (P 50–90) for most of them (48.3%). Nevertheless, the percentage of children with significant improvement – those who migrated from the deviant group at 4 years (P > 90) to the best functioning group at 12 years (P < 50) – was 20.7%. Similar results were also reported in the previously mentioned studies. Ferdinand and Verhulst (1995) found 34.1% changed from deviant (P > 90) to best functioning (P < 50), while Verhulst and van der Ende (1992) found 15%. Although it is appealing to consider an improvement in some of those with deviant scores in our study, we cannot exclude an effect of regression in the mean, which is higher at the lowest and highest scores, such as the 90th percentile, than in the values close to the mean. In addition, children with higher behavioral/emotional scores are more likely to be referred for treatment (Koot & Verhulst, 1992), which might be associated with lower scores at the follow-up.

Most children (70%) with the lowest problem scores at 4 years continued to have low scores at 12 years, while less than 5% of them became deviant. In addition, only a few children (3%) had high problem scores at both assessments. These percentages are also similar to those found by Verhulst and van der Ende (1992), who found that 67% of the children continued to have low problem scores and 2% became deviant, while Ferdinand and Verhulst (1995) found 55.3% and 7%, respectively. These data suggest that there was also a strong continuity of normal development. Thus, normal children are very likely to become normal adolescents even in developing countries.

Concerning predictors of behavioral and emotional problems, the results from the multivariate analyses showed that scores at aggressive and mainly rule-breaking behavior syndromes at 4 years are risk factors for different outcomes in mental health. A deviant score in one of these two CBCL syndromes increased the risk for deviant scores in Total Problems, Externalizing, and Internalizing, as well as in six out of eight CBCL syndromes. This suggests that externalizing problems tended to show a more homotypic continuity, since they predicted themselves, while internalizing problems presented a more heterotypic continuity, being predicted by both

internalizing and externalizing problems. Similar findings have been widely discussed in the literature (Hofstra et al., 2002; Rutter et al., 2006).

The CBCL Aggressive and Rule-Breaking Behavior syndromes – constructs resembling oppositional defiant disorder and conduct disorder in the DSM-IV (APA, 1994) – represent part of the developmental history of different behavioral and emotional problems in pre-adolescence. At a young age, when ways of expressing symptoms may be limited, externalizing problems can be seen as phase-specific markers of a disorder that will appear in the future with different characteristics. In other words, pre-school children are more likely to use actions to express conflicts, anxieties or even thoughts, since the most complex psychic mechanisms involving symbolization, communication of feelings and drive restraint remain restricted at this developmental stage (Campbell & Ewing, 1990). However, it is always important to highlight difficulties in assessing pre-school emotional problems in a reliable and useful manner (Rutter et al., 2006).

The great similarity in the course of child behavioral/emotional problems with different cohorts worldwide confirms the external validity of the constructs implemented in the CBCL (Crijnen et al., 1999), suggesting that similar psychopathological findings are found when the same methodology is applied in different cultural contexts (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). In other words, our findings suggesting similar patterns of emotional and behavioral developmental trajectories in children from a developing country compared to those detected in developed countries support previous findings from other investigations with clinical and non-referred samples documenting similar prevalence and risk factors of psychiatric problems, as well as clinical and CBCL profiles in children from Brazil similar to those found in the US and Europe (Fleitlich-Bilyk & Goodman, 2004; Goodman et al., 2007; Roessner et al., in press). In addition, this similarity of findings in cohorts from different countries suggests that the trajectory of emotional and behavioral problems is probably more influenced by age-specific effects than cultural factors. However, it is important to note that the South region of Brazil, where the study was conducted, has a higher human development index (HDI) than the country's mean HDI (PNUD, 2007). Thus, our sample might be more similar to those from developed countries than samples from either other regions of Brazil or other developing countries.

Strengths and limitations

This study met the methodological criteria previously suggested by Robins and Rutter (1990), since it investigated behavioral/emotional problems in a representative sample of the population, assessed longitudinally through standardized procedures and followed over a long period of time. In addition, we found a high percentage of children in the second assessment, ruling out the possibility of selection bias. The baseline assessment of mental problems at age 4 was at an earlier age than most other longitudinal studies examining the same topic. Moreover, our findings extend previous results in developed countries to community samples from developing countries for the first time. The main limitation of this study is the fact that other sources of information such as the pre-adolescents themselves and their teachers did not provide data for comparing with parent reports. Unfortunately, the CBCL – teacher and self report – had not yet been validated in Brazil. Moreover, no previous investigation assessed the factor structure of the CBCL in Latin American countries.

Conclusion

Behavioral/emotional problems of pre-school children showed a *medium* stability through pre-adolescence, with externalizing problems showing higher stability and more homotypic continuity than internalizing problems. Rule-Breaking Behavior at 4 years was the strongest predictor of different outcomes at 12 years. The CBCL externalizing syndromes – Aggressive and Rule-Breaking Behavior – comprise the developmental history of most behavioral/emotional problems at pre-adolescence.

Our findings are in line with major findings from developed countries. The results are quite similar for continuity, stability and predictability compared to those found in developed countries, challenging the previous notion that living in a developing country might determine a worse developmental course of behavioral and emotional problems. In addition, our findings increase the knowledge about the typical course of behavioral/emotional problems in children of the general population in developing countries, which is crucial for providing guidelines for mental health policies.

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