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# *Performance on the A-not-B Task of Argentinean I from Unsatisfied and Satisfied Basic Needs H*

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**Abstract**

Studies based on animal and human models have shown structural and functional alterations in the Cen System after exposure to early enriched, or deprived, environments. Poverty, as a complex phen environmental deprivation, was repeatedly associated with deleterious consequences for early cognitive This study compares the performance of 280 Argentinean infants (six- to 14-month-old) from Uns Satisfied Basic Needs homes on the *A-not-B* task, as an early executive function predictor. In this watch as an object is hidden in one of two hiding places (left-right locations), and after a delay per allowed to search for that object. Results showed that infants from poor homes performed fewer correct responses, and made more perseverative and non-perseverative errors than non-poor infan Findings suggest that poor home environments bring about a condition that affects the management involved in *A-not-B* task resolution.
*Keywords: A-not-B* task; cognitive development; poverty; infants.

**Desempeño en la Prueba A-no-B de Infantes Argentinos Provenientes de Hogar con y sin Necesidades Básicas Satisfechas**

**Resumen**

Estudios basados en modelos animales y humanos han mostrado alteraciones estructurales y fun Sistema Nervioso Central después de la exposición temprana a ambientes empobrecidos o enriq pobreza, como fenómeno complejo de deprivación ambiental, ha sido reiteradamente asociada con efect del funcionamiento cognitivo temprano. El presente estudio compara el desempeño de 280 infante (seis a 14 meses de edad) provenientes de hogares con y sin necesidades básicas satisfechas, en la p *B* (predictor temprano de funcionamiento ejecutivo). En ella, los infantes observan el ocultamiento de u una de dos localizaciones espaciales posibles, para buscarlo luego de un retardo. Los resultados mues infantes de hogares con NBI efectuaron menos respuestas correctas consecutivas y más errores per y no perseverativos que los de hogares con NBS ($p$<0.05). Los resultados sugieren que la condición la plasticidad de los recursos cognitivos involucrados en la prueba.
*Palabras clave:* Prueba *A-no-B*; desarrollo cognitivo; pobreza; infantes.

Executive functioning (EF) refers to a complex and still provisional cognitive construct that involves general-purpose control mechanisms that modulate the operation

dynamics of cognition. Specifically, g subsume a set of higher order parallel planning, problem solving, organi

brain regions, which occurs throughout development and well into the second decade of life (Diamond, 2001a; Klingberg, Forssberg, & Westerberg, 2002; Stuss & Alexander, 2000; Wood & Grafman, 2003). Furthermore, research has identified a stage-like sequence of executive function development characterized by "spurts" in executive abilities beginning from 12 months of age, with the majority of functions coming around the age of eight (Case, 1992; Luciana & Nelson, 1998). Whereas some studies argued that EF only can be identified in four-year-olds and older children (Anderson, 1998; Luciana & Nelson, 1998), others proposed that it appears much earlier (Diamond, 1985, 1990, 2001a; Diamond, Kirkham, & Amso, 2002; Espy, Kaufman, Glisky, & McDiarmid, 2001; Welsh & Pennington, 1988). When age-appropriate tasks demanding integration, effortful, formal and content novelty are available (Phillips, 1997), an increase in non-verbal executive competence in infant (Diamond, 1985, 2001a; Diamond & Goldman-Rakic, 1989; Welsh & Pennington, 1988) and preschool-aged children (Diamond et al., 2002; Espy et al., 2001; Hughes, 1998; Klenberg, Korkman, & Lahti-Nuutila, 2001; Luciana & Nelson, 1998; Zelazo, Carter, Reznick, & Frye, 1997), has been reported in several studies. Complementary, results of developmental studies based on exploratory and confirmatory factor analyses suggest that EF is not homogeneous and that a multistage development of different components proceeds from infancy to adolescence (Anderson et al., 2001; Espy, Kaufman, McDiarmid, & Glisky, 1999; Klenberg et al., 2001; Lehto, Juujärvi, Kooistra, & Pulkkinen, 2003). Finally, at least two EF components were proposed at the core of cognitive development: inhibition of prepotent responses and working memory (Lehto et al., 2003; Miyake et al., 2000; Rusell, 1999).

Specifically, performance on the *A-not-B* task is often held to be one of the first signs of emerging executive functioning in infancy (Diamond, 1985, 1990, 2001a; Diamond & Goldman-Rakic, 1989; Espy et al., 1999; Goldman-Rakic, 1987; Rusell, 1999; Welsh & Pennington, 1988). The standard *A-not-B* search task is a variant of the delayed-response paradigm devised to study the effects of delay on search

the B well, they search for it in A, even
just seen the object being placed inside
that the *A-not-B* error is caused by con
such as a failure to understand specifi
desired object (Piaget, 1954). Althou
followed piagetian approach (Butterwo
Appel, Evans, Le Compte, & Wright, 1
others have emphasized basic cognitive
deficits in short-term memory (Cummin
the combination of memory deficits and
control (Diamond, 1985; Diamond & Gol
or means-end behavior (Baillargeon
Berthental, 1996). Other theoretical app
repetition of motoric schemes as the u
(Smith, Thelen, Titzer, & McLin, 1999; Be
a different version of the task (Diamond,
Competing-Systems account proposes
organized dissociable systems: a) the respo
by motor experience and the effect of the
lar location; b) the conscious representatio
the infant's conscious representation of
hidden object (Zelazo, Reznick, & Spinaz
from the most updated meta-analytic stu
and the distance between locations are p
the proportion of infants who search c
number of A trials and delay between hi
negative predictors (Marcovitch & Zelaz

Performance on *A-not-B*, as well as
tasks, has also been significantly as
maturation and function (or immaturi
error) of dorsolateral circuits in the
(Diamond, 2001a; Diamond & Gold
Nelson et al., 2000). Similar persevera
on *A-not-B* and Delayed Response task
frontally ablated adult monkeys (Dian
Rakic, 1989), intact and frontally ablat
(Diamond & Goldman-Rakic, 1989), a
12- month-old human infants (D
Furthermore, resting frontal EEG acti
anterior to posterior EEG coherence (Bel

1985, 1990, 2001a). In cross-sectional studies, the *A-not-B* error has been found at delays a few seconds shorter at each age than is found in longitudinal studies. Explanations proposed for this difference included practice effects in longitudinal studies or the unfamiliar condition of experimenter and testing room in cross-sectional studies (Diamond, 1985).

Evidence from experimental contexts have largely demonstrated that in different species certain structural and functional features of the Central Nervous System, such as the resolution of cognitive tasks, can be modulated through the manipulation of environmental conditions during early development (Greenough & Volkmar, 1973; Rosenzweig & Bennet, 1996). Human home environment quality could be associated with deprived or enriched environments, depending on the presence or absence of poverty. Poverty is usually associated with a low home environment quality, and children living in occasional and even persistent poverty present alterations in their cognitive development (Bradley et al., 1989; Brooks-Gunn & Duncan, 1997; McLloyd, 1998). It has been further demonstrated that different aspects of language and spatial processing development, examined through general intelligence or developmental paradigms, are affected in subjects from low-income families and in ethnic minorities (Brooks-Gunn & Klebanov, 1996; Burchinal, Campbell, Bryant, Wasik, & Ramey, 1997; Brooks-Gunn & Duncan, 1997; McLloyd, 1998). Cognitive stimulation in the home, parenting style, physical environment of the home and poor child health were proposed as mediating factors that are affected by lack of income and that influence children's cognitive development (Georgieff & Rao, 2001; Grantham-McGregor & Ani, 1999; Guo & Mullan-Harris, 2000; Mendola, Selevan, Gutter, & Rice, 2002; Ornoy, 2003). Furthermore, systematic differences between societies regarding their cultural patterns, schooling practices and psychological environment, impact performance on both verbal and non-verbal tests (Rogoff & Chavajay, 1995; Sattler, 2001). Thus, skills prescribed by a culture, together with the cognitive strategies that vary among cultures, interact with inherent patterns of brain organization (Eviatar, 2000). Attempts to develop tests that are culture fair have not been successful,

non-poor homes on performance
Theoretical and methodological reas
include: a) to evaluate effects of pov
performance (infancy) in order to add
such effect to studies carried out with
to use an alternative approach to
developmental quotients paradigms,
memory and inhibitory control proces
first years of cognitive development; c)
*not-B* task from a non-Anglo-Saxon san
cross-cultural performance difference

## Method

### Participants

The sample comprised 280 r
children (Hispanics or Latinos of any
from 6 to 14 months (see Table 1 for s
age and gender). These participants
sanitary control at *Pedro de Elizald*
in the city of Buenos Aires between
families inhabited the poorest regio
Buenos Aires: Florencio Varela, Qui
Entry into the sample followed strict
first maternal language, normal or
hearing, no record of serious medical
history of psychiatric illness, no histo
injury, seizures, or neurological c
substance abuse or dependence.
symptoms of acute disease, were bor
and height suitable for gestational
gestation, obstetric, and delivery hist
conducted in accordance with APA e
treatment of the study sample. I
administration of the task provid
consent. Ethics Committee at the
*Pediatric Hospital* approved this stu

Table 1.
*Sample Sizes by Group, Age and Gen*
*Children*

| | G |
|---|---|
| | SRN |

Table 2.
*Mean Scores of Socioeconomic Variables by Group of the Argentinean Children*

| | Group | | | | |
|---|---|---|---|---|---|
| | SBN | | UBN | | |
| | *M* | *SD* | *M* | *SD* | *p* |
| Education | 6,47 | 2,47 | 5,86 | 2,61 | NS |
| Occupation | 5,91 | 1,82 | 4,18 | 2,51 | < 0,( |
| Dwelling | 11,53 | 1,09 | 8,73 | 2,39 | < 0,( |
| Overcrowding conditions | 7,78 | 1,48 | 5,59 | 1,65 | < 0,( |
| Total Score | 31,69 | 4,34 | 24,36 | 5,47 | < 0,( |

*Note:* SBN=Satisfied Basic Needs; UBN=Unsatisfied Basic Needs; NS = n
significant; *p*.

### Poverty Measure

Before performing on the task, a socioeconomic scale (NES; see Appendix A for details) was administered to infant mothers. NES scale, used in other studies in Argentina (for example, CESNI, 1995), is derived from the Unsatisfied Basic Needs (UBN) direct method for measure poverty (Boltvinik, 2000; INDEC, 1994). It includes several indicators that attempt to capture different dimensions of poverty at the household and individual levels. Income direct method was not used in this study due to either lack of information or of reliable information. A total score (TS) was obtained based on scores from parents educational background (Ed), parents occupational background (Oc), dwelling (Dw) and overcrowding conditions (Ov) (TS=Ed + Oc + Dw + Ov). TS, Ed, Oc, Dw and Ed were the dependent variables. Scores were assigned directly to parents for educational and occupational backgrounds, but only the higher was considered for the Total Score. In the case of dwelling, first scores assigned to each item were summed (SS) (type, floor, water, bathroom, ceiling, external walls and home property), and then a final score (FS) was assigned to this figure according to the following criteria: for SS between zero and five the FS was three; for SS between six and 11 the FS was six; for

measurement of *A-not-B* error (persev
tetragonal wooden table measuring 35 inc
inches in width was used, in which two
measuring four inches in diameter and t
Both wells were separated by 11 i
equidistant from one another and from
cloths with sides of approximately ten i
covers. Several toys were used in each te
size was suitable for hiding in the wells
shape and color to get children's attent

### Measures and Procedure

Infants were tested individually in a q
the hospital. Testing was scheduled at times
not to interfere with regular meals. Exam
the hypotheses of the study. Infants were se
lap facing the experimenter across the test
experimenter was placed behind and record
of toys was available so the experimenter
was attractive to each infant. If the infan
current toy, a different toy was used. A s
of the parent holding the infant's hands. Th
hid the toy in one well and covered both w

and the opportunity to retrieve and play with the toy. Reward was contingent on removal of the correct cloth to maximize motivation to reach correctly. Any response other than a correct retrieval was scored as incorrect. Infants were scored as making an error if they reached to the empty, covered well, if they reached simultaneously to both wells, or if they did not reach at all. As in other studies (Diamond, 1985; Diamond & Goldman-Rakic, 1989; Matthews, Ellis, & Nelson, 1996), the most common type of error was reaching to the empty, covered well. When infants did not reach correctly, the mother and the experimenter remained neutral, and the experimenter removed the correct cloth and retrieved the toy as the infant watched. When an infant retrieved the toy correctly from the same well two trials in a row, the toy was hidden in the other well. The delay between covering of the wells and release of the infant's hands was varied from less than one to ten seconds. The task was first administered with delays lower than 1 second. When each child reached 90% efficiency (correct trials/ administered trials), the delay was increased to five seconds. Again, once the efficiency criterion was reached, the delay was increased to ten seconds, repeating the criterion one last time. Each infant received between ten and 15 trials per delay. If there was no response 30 seconds after the delay, the trial was considered over (did not reach at all) and the next trial was administered. The cut criteria were five consecutive incorrect trials. The administration of the task took about 20 minutes per infant.

Five dependent variables were calculated following Espy et al., (1999, 2001) criteria: 1) *correct responses*, defined as the total number of correct retrievals pondered by the total number of administered trials per delay (efficiency); 2) *consecutive correct responses*, defined as the total number of consecutive correct trials pondered by the total number of administered trials per delay [for example, if in a given delay an infant correctly responded on all the following trials AABBAABBAA, his consecutive reward consecutively for two trials. chosen to achieve measurement consi al infants.

### Experimental Design and Analysis

Two multivariate analysis of varian were used to examine group-related N group-related performance. In the related NES characteristics, *gr* Unsatisfied Basic Needs; *SBN* (non Needs] was the fixed factor, an *educational background* (Ed), *occu* (Oc), *dwelling* (Dw), and *overcrow* were the dependent variables. In the related-performance, *group* (*UBN*, factor; *age* (6 to 14 months) and *d* second; *2*: five seconds; *3*: ten second (Design: Intercept+Age+Delay+ *responses*, *consecutive correct resp errors*, and *non-perseverative error* variables. *A Trials* dependent variabl the MANOVA because it did not co other dependent variables of the tas related performance on this variable addition, T-Test and Mann-Withney t pare obstetric history and delivery va Kolgomorov-Smirnof test was used that samples came from a normal d was used to test nonrandom (depende and arc sine transformations for sta Box's Test of Equality of Covarianc and Levene's Tests of Equality of Erro in all cases. The probability of a Type at .05 for all analyses. All analyses Stata Version 7.0.

## Results

### NES Scale Analysis

MANOVA results indicated a sign *group*, Wilk´s $\lambda$=0.41, $F(4,238)$=78.14 between groups showed that the significantly less scores in *occupatio*

Table 3.

*Mean Values and Comparison of Pre and Perinatal Variables by Group of the Argentinean C*

| | Group | | | | | |
|---|---|---|---|---|---|---|
| | SBN | | | UBN | | |
| Variable | *M* | *SE* | *n* | *M* | *SE* | *n* |
| *Obstetric history* | | | | | | |
| Previous pregnancies | 1,85 | 0,11 | 122 | 1,80 | 0,09 | 105 |
| Previous deliveries | 1,20 | 0,08 | 122 | 1,51 | 0,09 | 105 |
| Previous abortions | 0,46 | 0,06 | 122 | 0,17 | 0,04 | 105 |
| Previous cesareans | 0,25 | 0,05 | 122 | 0,06 | 0,02 | 93 |
| Prenatal care | | | | | | |
| *First examination (month)* | 2,26 | 0,11 | 122 | 2,56 | 0,14 | 87 |
| Obstetric examinations | 7,31 | 0,23 | 98 | 6,78 | 0,34 | 93 |
| Maternal smoking | 0,26 | 0,04 | 122 | 1,42 | 0,03 | 109 |
| High temperature episodes | 0,04 | 0,01 | 122 | 0,06 | 0,02 | 99 |
| Hemorrhages | 0,09 | 0,02 | 122 | 0,11 | 0,03 | 105 |
| Diabetes Mellitus | - | - | 116 | - | - | 100 |
| Maternal anemia | 0,20 | 0,03 | 122 | 0,12 | 0,03 | 100 |
| Urinary infections | 0,21 | 0,03 | 116 | 0,30 | 0,04 | 100 |
| Exposure to radiologic studies | - | - | 122 | 0,13 | 0,03 | 93 |
| Pregnancy-related hypertensive episodes | 0,09 | 0,02 | 122 | 0,19 | 0,04 | 100 |
| *Delivery* | | | | | | |
| APGAR 8 | 8,51 | 0,77 | 92 | 8,91 | 0,28 | 89 |
| APGAR 10 | 9,92 | 0,29 | 92 | 9,91 | 0,27 | 89 |
| Weight at birth | 3155,46 | 29,22 | 122 | 3256,55 | 49,97 | 105 |
| Weeks os pregnancy | 39,02 | 0,09 | 104 | 39,21 | 0,13 | 99 |
| Anesthesia in delivery | 0,65 | 0,09 | 102 | 0,70 | 0,06 | 98 |
| Stress in delivery | - | - | 122 | - | - | 105 |
| *Neonatal Data* | | | | | | |
| Intensive care unit (ICU) | 0,13 | 0,03 | 100 | 0,07 | 0,03 | 100 |
| Reanimation | - | - | 110 | - | - | 105 |
| Jaundice | 0,41 | 0,05 | 116 | 0,31 | 0,05 | 105 |
| *Puerperium* | | | | | | |
| Post-partum depression | - | - | 122 | - | - | 105 |
| Breast feeding | 0,90 | 0,03 | 122 | 0,88 | 0,03 | 103 |
| Iron supplement | 0,75 | 0,04 | 104 | 0,94 | 0,02 | 100 |
| *Infant present data* | | | | | | |
| Present weight | 9407,12 | 84,17 | 122 | 9100,45 | 138,71 | 105 |
| Present height | 72,97 | 0,27 | 122 | 72,03 | 0,33 | 105 |
| Present cephalic Perimeter | 45,81 | 0,15 | 116 | 45,50 | 0,13 | 105 |

Test). For this reason the variable was eliminated from subsequent analysis.

Regarding *age*, the *consecutive correct responses*, $F(1,442)=38.59$, $p<0.01$, $B=0.57$, increased and *non-perseverative errors*, $F(1,442)=28.38$, $p<0.01$, $B=-0.38$, decreased with age in both groups. In contrast, *perseverative errors* was steady across ages, $F(1,442)=2.65$, $p<0.10$, $B=-0.04$. Comparisons of these variables with *Delay* revealed that in both groups the *consecutive correct responses* significantly decreased at longer delays, $F(1,442)=11.42$, $p<0.001$, $B=-0.131$, while the *perseverative errors*, $F(1,442)=0.15$, $p=0.69$, and *non-perseverative errors*, $F(1,442)=0.04$, $p=0.84$, remained unchanged. Subjects of both groups and all ages made *perseve* in the condition of less than 1 second

Comparisons between groups show made fewer *consecutive correct resp* $p=0.03$, $B=-0.198$, and more *pers* $F(1,442)=8.54$, $p<0.01$, $B=0.06$, a *errors*, $F(1,442)=5.27$, $p=0.02$, $B=0.01$ and Standard Deviations).

Finally, no differences were obse comparing *A trials* before the first rea $F(1,355)=0.91$, $p=0.34$. Mean and sta $3.21\pm2.24$ ($n=197$) for *SBN* gr ($n=160$) for poor group.

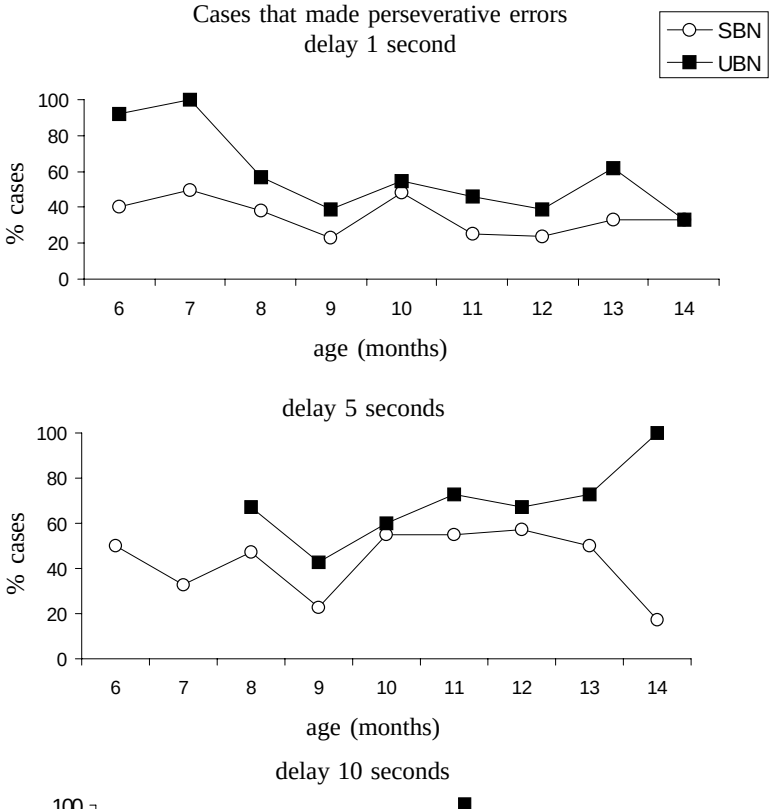

Table 4.

*Means and Standard Deviations of A-not-B Dependent Variables by Group, Age and Delay*

| | Dependent Variable[1] | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Consecutive Correct Responses | | | | | | Perseverative Errors | | | | | | Non-Perseverative | | | |
| | SBN | | | UBN | | | SBN | | | UBN | | | SBN | | | |
| Age[2] | *M* | *SD* | *n* | *M* | *SD* | *n* | *M* | *SD* | *n* | *M* | *SD* | *n* | *M* | *SD* | *n* | *M* |
| 1-second delay | | | | | | | | | | | | | | | | |
| 6 | 0,5 | 0,3 | 15 | 0,3 | 0,2 | 12 | 0 | 0 | 15 | 0,1 | 0,1 | 12 | 0,1 | 0 | 15 | 0,2 |
| 7 | 0,4 | 0,3 | 23 | 0,3 | 0,2 | 11 | 0,1 | 0 | 23 | 0,1 | 0,1 | 11 | 0,2 | 0,1 | 23 | 0,2 |
| 8 | 0,7 | 0,2 | 19 | 0,5 | 0,3 | 16 | 0 | 0 | 19 | 0,1 | 0 | 16 | 0,3 | 0,3 | 19 | 0,5 |
| 9 | 0,6 | 0,3 | 13 | 0,6 | 0,3 | 11 | 0 | 0 | 13 | 0 | 0 | 11 | 0,1 | 0,1 | 13 | 0,1 |
| 10 | 0,7 | 0,2 | 27 | 0,6 | 0,3 | 12 | 0 | 0 | 27 | 0 | 0,1 | 12 | 0,1 | 0,1 | 27 | 0,1 |
| 11 | 0,7 | 0,2 | 12 | 0,7 | 0,3 | 12 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 0,1 | 12 | 0,1 |
| 12 | 0,6 | 0,2 | 11 | 0,7 | 0,2 | 18 | 0 | 0 | 11 | 0,1 | 0 | 18 | 0 | 0,1 | 11 | 0,1 |
| 13 | 0,6 | 0,1 | 7 | 0,6 | 0,3 | 11 | 0 | 0 | 7 | 0 | 0 | 11 | 0,2 | 0,1 | 7 | 0,2 |
| 14 | 0,8 | 0,2 | 5 | 0,8 | 0,1 | 5 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 5 | 0 |
| 5-second delay | | | | | | | | | | | | | | | | |
| 6 | 0 | 0 | 5 | ´- | ´- | ´- | 0 | 0 | 5 | ´- | ´- | ´- | 0,5 | 0,1 | 5 | ´- |
| 7 | 0,4 | 0,3 | 5 | ´- | ´- | ´- | 0 | 0 | 5 | ´- | ´- | ´- | 0,3 | 0,2 | 5 | ´- |
| 8 | 0,3 | 0,2 | 12 | 0,2 | 0,2 | 5 | 0 | 0 | 12 | 0,1 | 0,1 | 5 | 0,2 | 0,2 | 12 | 0,3 |
| 9 | 0,5 | 0,3 | 8 | 0,3 | 0,3 | 5 | 0 | 0 | 8 | 0,1 | 0,1 | 5 | 0,1 | 0,1 | 8 | 0,2 |
| 10 | 0,5 | 0,2 | 19 | 0,4 | 0,2 | 7 | 0,1 | 0,1 | 19 | 0,1 | 0,1 | 7 | 0,1 | 0,2 | 19 | 0,2 |
| 11 | 0,6 | 0,2 | 9 | 0,4 | 0,1 | 9 | 0,1 | 0,1 | 9 | 0,1 | 0,1 | 9 | 0,1 | 0,2 | 9 | 0,1 |
| 12 | 0,6 | 0,2 | 8 | 0,5 | 0,3 | 12 | 0 | 0,1 | 8 | 0,1 | 0,1 | 12 | 0,1 | 0,1 | 8 | 0,2 |
| 13 | 0,4 | 0,2 | 5 | 0,5 | 0,1 | 6 | 0,1 | 0,1 | 5 | 0,1 | 0,1 | 6 | 0,3 | 0,2 | 5 | 0,3 |
| 14 | 0,8 | 0,1 | 4 | 0,3 | 0,3 | 3 | 0 | 0 | 4 | 0,1 | 0 | 3 | 0 | 0 | 4 | 0,2 |
| 10-second delay | | | | | | | | | | | | | | | | |
| 6 | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- |
| 7 | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- |
| 8 | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- | ´- |
| 9 | 0,9 | 0,1 | 3 | ´- | ´- | ´- | 0,1 | 0,1 | 3 | ´- | ´- | ´- | 0,1 | 0,1 | 3 | ´- |
| 10 | 0,9 | 0 | 2 | ´- | ´- | ´- | 0 | 0 | 2 | ´- | ´- | ´- | 0 | 0 | 2 | ´- |
| 11 | 0,7 | 0,2 | 3 | 0,6 | 0,3 | 3 | 0 | 0 | 3 | 0,1 | 0 | 2 | 0 | 0,1 | 3 | 0,1 |
| 12 | 0,5 | 0,4 | 3 | 0,5 | 0,4 | 3 | 0 | 0 | 3 | 0,1 | 0,1 | 3 | 0,2 | 0,2 | 3 | 0,1 |
| 13 | 0,7 | 0,6 | 2 | 0,6 | 0,5 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 2 | 0 |
| 14 | 0,7 | 0,1 | 3 | ´- | ´- | ´- | 0 | 0 | 3 | ´- | ´- | ´- | 0 | 0 | 3 | ´- |

*Note:* SBN=Satisfied Basic Needs group; UBN=Unsatisfied Basic Needs group; [1]*correct respon*
eliminated (see Results); [2]in months.

## Discussion

Second, with respect to delay, *co*

*perseverative errors* used in the present study (Espy et al., 1999), does not consider as such those errors occurring following reversals. Another difference with the results obtained in Anglo-Saxon studies (Butterworth, 1977; Diamond, 1985; Diamond & Goldman-Rakic, 1989; Gratch & Landers, 1971) is that with the delay of <1 second all the children made *perseverative errors*. This could be interpreted: a) as an effect of the cross-sectional nature of the study (practice effects, or unfamiliar condition with the experimenter and testing room) (Diamond, 1985); b) as the alteration of functions of cognitive specific domains, e.g. attention (Anderson, 1998; Klenberg et al., 2001); or c) as a combination of them. More investigation would be needed to refute these hypotheses. Due to the cross-sectional character of this study, and the duration of the delay periods used, we cannot provide a further insight regarding the delay needed to produce perseverative errors.

According to our results the *SBN* group made significantly more *consecutive correct responses* and fewer *perseverative and non-perseverative errors* than the *UBN*. Thus, *SBN* infants performed better on the *A-not-B* task than the *UBN*, which is attributable to an increase in the two types of errors, i.e., perseverative and non-perseverative. The former error has been associated with immaturity concerning object permanence (Piaget, 1954), with impairment of the inhibitory control, and with mechanisms involved in spatial working memory processes (Diamond, 1985, 1990, 2001). *Non-perseverative errors* are more likely to be associated with attention, space codification and search strategies than with inhibitory control (Ahmed & Ruffmann, 1998; Diamond, 1990, 2001; Diamond & Goldman-Rakic, 1989). Present results do not allow to clearly determining whether *perseverative* and *non-perseverative errors* were either mnemic immature, produced by attentional deficits, or by difficulties in inhibitory control or in codifying spatial locations. Regarding development of unsuitable manual search strategies (which also include motor components) results showed that infants were able to reach correctly. It could be argued that *UBN* infants' performance was associated or that the decodification of task c representation) was also difficult for S at the high level of difficulty (ten se

This study did not apply the measurement of establishment of pov as most Anglo-Saxon studies do (Br Gunn & Duncan, 1997; McLloyd, 1 lack of reliability in the information need to identify homes whose pover than five years). The application of th (Boltvinik, 2000) allowed to characte different profiles of poverty: 1) T characterized by low levels of p (qualified workers), low quality hom rooms), little physical space in the ho of overcrowding (more than three p paternal educational level was also although the statistical differences w profile of the *SBN* group differed fr previous studies (Lipina, Vuelta, Colombo, 2000). In these cases p levels were higher (professionals), l quality and the mean total score in the (11.84 points more than that of this

Concerning the conditions of the prenatal care, the mothers of the *UBN* tobacco, had more episodes of hyperte deliveries, abortions and cesarean. Co and episodes of hypertension during considered prenatal risk factors for (Mendola et al., 2002; Ornoy, 2003; W Graziano, 2001). Yet, since the perce consumed tobacco was 17% (with an a per day) and that of episodes of hy suggested that the contribution of differences observed in cognitive perfo been high. The groups did not differ indicators: obstetric history (previous care (first examination, obstetric temperature episodes, hemorrhage

Between the mechanisms mediating the effects of poverty on children's cognitive development proposed by Guo and Mullan-Harris (2000), that of the inadequate physical environment of the home is the only one that this study can confirm in the UBN group. Cognitive stimulation at home and parenting style have not been evaluated. Regarding these last two factors, in different studies with African-American cases, positive associations were found between levels of poverty and of home stimulation, evaluated with the HOME scale (Bradley, 1989). On the other hand, in the study carried out by CESNI (1995), such associations were found, which suggests the need for more investigation.

The *SBN* and *UBN* functional characteristics herein described are far from representing the general population of these age groups and cultural contexts. To achieve global outcomes, further study including a higher number of cases, and diverse cultural origin, are needed in order to correlate this (working memory and inhibitory control) and other executive functions with ethnicity, home stimulation, type of neighborhood, and other environmental features associated with poverty. Aside from these pending matters, results from the present study allowed to (a) identify a specific executive functioning profile in infants from Unsatisfied Basic Needs homes, (b) the use of an alternative approach for the analysis of intelligence or developmental quotients paradigms in the study of poverty effects on cognitive performance, and (c) the attainment of a Latin-American infant executive performance database, which could be used either in intervention programs, or to test theoretical issues regarding executive components and sub processes.

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## APPENDIX A
### NES Scale for Measure Poverty

**educational background**

| | Father | Mother | Years of education |
|---|---|---|---|
| Complete University | 12 | 12 | 18 |
| Incomplete University | 10 | 10 | 12-18 |
| Complete College | 10 | 10 | 15 |
| Incomplete College | 9 | 9 | 12-15 |
| Complete Secondary | 9 | 9 | 12 |
| Incomplete Secondary | 6 | 6 | 7-12 |
| Complete Primary | 3 | 3 | 7 |
| Incomplete Primary | 1 | 1 | 0-7 |
| No education | 0 | 0 | 0 |
| ***Educational Score:*** | | | |

**occupational background**

| | Father | Mother |
|---|---|---|
| CEO | 12 | 12 |
| Professional | 11 | 11 |
| In charge of a small company | 10 | 10 |
| Technical employer | 8 | 8 |
| Administrative employer | 7 | 7 |
| Seller | 7 | 7 |
| Independent manufacturer | 6 | 6 |
| Independent technician | 6 | 6 |
| Qualified worker | 4 | 4 |
| Non qualified worker | 2 | 2 |
| Non permanent worker | 1 | 1 |
| Servant | 1 | 1 |
| Unemployed | 0 | 0 |
| Does not work | 0 | 0 |
| ***Occupational Score:*** | | |

**dwelling**

| Type | | Bathroom | |
|---|---|---|---|
| Home | 2 | Sheared | 0 |
| Appartment | 2 | Toilet | 3 |
| Shanty | 0 | Ceiling | |
| Tenancy Room | 0 | Asphalt | 3 |
| Hostel | 0 | Flagstone | 3 |
| Shop premises | 0 | Roof tile | 3 |
| Motor home | 0 | Metal sheet | 1 |
| Homeless | 0 | Plastic sheet | 1 |
| Floor | | Cardboard sheet | 0 |
| Ceramic tile, carpet, wood | 3 | Canes, wooden boards | 0 |
| Cement, fixed brick | 1 | External walls | |
| Ground, non-fixed brick | 0 | bricks, stones, concrete | 3 |
| Water | | wood | 2 |
| Public net | 2 | Metal sheet | 1 |

Most likely NOT. Because you are not satisfied. You can easily fix those things. You can order a new meal, find a better dress or apply a filter on your selfie. Yet, the alarming thing for me is people go on with their lives feeling unsatisfied. They have the option to improve, yet, they go on day after day living the same kind of life they have carrying the same frustrations. Are you satisfied with your life right now? Do you know the reason of your satisfaction or dissatisfaction? An accidental experiment took place in U.S. government around 1890.Â  They worked based on the limitations of their capacities instead of otherâ€™s belief about their possible performance. Many people like to set expectations on us. They set limit on our abilities and how we perform. Performance on the A-not-B task of Argentinean infants from unsatisfied and satisfied basic needs homes. Interam J Psychol. 2005; 39: 49-60.Â  Growth rates of modern science: a bibliometric analysis based on the number of publications and cited references. J Assoc Inf Sci Technol. 2015; 66: 2215-2222. Performance on the A-not-B task of Argentinean infants from unsatisfied and satisfied basic needs homes. Article. Full-text available.Â  The school nutrition programs provide free or low-cost meals that satisfy the dietary goals of lunches and breakfasts to most school-age children. The Medicaid program has extended health insurance coverage to millions of low-income children. However, many children remain uninsured, and children enrolled in Medicaid do not have the same access to medical care as privately insured children.