

## Plasticity of Socio-Emotional Skills: Age Differences During Adolescence

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## Abstract

The present paper examines normative developmental patterns and gender differences in adolescence in broad factors of social-emotional skills. This work is guided by a study conducted by Soto et al. (2011) examining these themes in a large internet sample primarily reflecting US. participants. Developmental patterns and gender differences are examined here in two large samples of Brazilian adolescent students collected in the states of Sertãozinho (N=3,022; aged 9 to 12) and Rio de Janeiro (N= 20,666; aged 10-11, and 15 to 18). The results showed that developmental patterns for Conscientiousness, Agreeableness and Neuroticism were to a large extent replicable, as well as gender differences. This work adds to the growing evidence on normative developmental trait patterns, helpful for the discussion on social-emotional skill development.

Key words: Large-scale assessment; Social-emotional skills; 21<sup>st</sup> century skills; Normative development; Adolescence, Plasticity, Brazil.

## Plasticity of Socio-Emotional Skills: Age Differences During Adolescence

The past years witnessed an increased attention for the assessment and development of socio-emotional skills (SEMS) in the classroom. Today, SEMS are considered as both means and end products of education processes, in addition to different indicators of academic achievement, such as language or mathematics comprehension. Learning and training SEMS became an explicit part of educational curricula, because SEMS are assumed to (in)directly affect consequential outcomes in the short and long term, including labor market fitness and employability, health and longevity, but also happiness, interpersonal relatedness and civil citizenship. In addition, there is evidence that SEMS also facilitate learning processes at school, and contribute to academic achievement (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Indeed, it should come as no surprise that training task engagement and goal achievement skills, both subsumed under the broader group of self-management SEMS, leads to better academic performance. Although, explicit attention for SEMS and their assessment is rather recent, educational practice has a long history of implicitly developing these characteristics, with massive idiosyncratic experiences accumulated among teachers and educators across time.

There is nowadays general agreement about the importance of SEMS in education. The recent courtesy on SEMS in the public debate and literature has been also incorporated by the Organization for Economic Cooperation and Development (OECD), including a first assessment of some SEMS in its large-scale Programme for International Student Assessment (PISA) running in 65 different countries. There remain, however, several fundamental questions on the conceptualization and assessment of SEMS (Duckworth & Yeager, 2015). Besides, there is only limited knowledge on the normative development of SEMS and what factors influence their natural course. To bridge this lacuna, the OECD recently launched a call for tender to study the developmental course of SEMS, intending to follow large cohorts of students in various cities across the globe. It is clear that these daunting issues have to be dealt with first, before one can adequately design interventions to train SEMS or suggest guidelines on how educational environments can support or enrich SEMS' development. The present paper first describes our conceptual take on the definition of SEMS and how these can be organized into a comprehensive and manageable framework. We hereby rely on psycho-social mechanisms and taxonomic work developed in personality research, and use this as an overarching model to accommodate various

operationalizations of 21<sup>st</sup> century skills. In a second step, hypotheses are generated on how SEMS may develop normatively relying on robust findings observed in personality development research. These hypotheses are investigated in two large samples of Brazilian adolescents (N= 3,022 and N= 20,666), using an etic and an emic questionnaires designed to measure SEMS. The etic measure was the Big Five Inventory (John, Donahue, & Kentle, 1991), initially developed in the US and then translated and adapted to Brazilian Portuguese; the emic questionnaire was the SENNA 1.0 (Primi, Santos, John, & De Fruyt, in press), a questionnaire specifically developed for this population of Brazilian adolescents by a local research team.

### SEMS CONCEPTUALIZATION AND FRAMEWORK

There are literally hundreds of definitions of SEMS (John & De Fruyt, 2015). Relying on an extensive review of the literature and input from various expert and policy maker panels from OECD countries, SEMS are defined as: “Individual capacities that (a) are manifested in consistent patterns of thoughts, feelings and behaviors, (b) can be developed through formal and informal learning experiences, and (c) influence important socioeconomic outcomes throughout the individual’s life” (OECD; 2015, p. 4). This definition is broad enough to capture a wide range of skills, further underscoring their malleability and consequential effects for the individual and society in general. Demarcated this way, SEMS form the educational equivalent of the ‘competency’ construct that is nowadays frequently used and advocated in the field of human resources and selection and organization psychology.

The challenge to bring order in the chaos of hundreds of SEMS’ terms closely resembles personality psychologists’ efforts to structure the large amount of personality descriptive terms, finally leading to the identification of the Big Five personality dimensions (John, 1990). Today, personality psychologists agree that the five dimensions of Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness form the largest common denominator to describe personality differences observable in various age and cultural groups (De Fruyt, De Bolle, McCrae, Terracciano, & Costa, 2009; McCrae & Terracciano, 2005). The availability of this empirical framework helped to solve the discussion on differentially labelling rather similar constructs and examine the overlap among presumed distinct constructs. This break-through considerably advanced the personality field and increased our knowledge on how to assess traits

and how personality traits develop across the life-course. A similar kind of structuring exercise seems recommended for the field of SEMS.

McCrae and Costa (1997) conceived traits as building blocks of more malleable constructs, called characteristic adaptations, such as competencies and SEMS. The Big Five framework has hence been successfully applied to structure competency models within the human resources field (De Fruyt, Bockstaele, Taris, & Van Hiel, 2006) or to classify the numerous SEMS listed in the 21<sup>st</sup> century educational literature (De Fruyt, Wille, & John, 2015; John & De Fruyt, 2015). Besides these classification efforts, there is also recent empirical evidence for the comprehensiveness of the Big Five to accommodate SEMS. Primi and colleagues (2016) recently demonstrated that the items and scales of frequently used measures to evaluate SEMS-learning could be easily mapped within the Big Five scheme. A joint factor analysis of the Nowicki-Strickland Locus of Control Scale (Nowicki & Strickland, 1973), Rosenberg Self-Esteem Scale (Rosenberg, 1979), Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997), Big Five Inventory (BFI; John et al., 1991), Self-Efficacy Questionnaire for Children (SEQ-C; Muris, 2001), Core Self-evaluations (CORE; Judge et al., 2003), and the Grit Scale (Duckworth & Quinn, 2009), showed that all their items could be easily structured under the umbrella of the five major dimensions of personality. Also a sixth factor popped up, tentatively labelled as Locus of Control/Negative Valence, though it was unclear whether this factor reflected substance or was more an artefact or method factor. Additional empirical evidence for the comprehensiveness and utility of the Big five framework to structure SEMS was provided by John and Mauskopf (2015) factor-analytically examining items included in 21<sup>st</sup> century skill measures (Trilling & Fadel, 2009). Given the comprehensiveness of the Big Five framework, Primi and colleagues (2016) subsequently started the construction of SENNA 1.0, a measure to assess SEMS in the context of educational policy research in Brazilian youth. SENNA 1.0 aimed to represent the content enclosed in the previously listed measures, organized in a manageable way, so the instrument could be used for large-scale assessments in schools in Brazil.

#### NORMATIVE DEVELOPMENT OF SEMS

A major advantage of embracing the Big Five to initially structure the field of SEMS is that a considerable volume of established knowledge from the personality field can be transferred to the SEMS domain, including findings on normative developmental trends in traits, moderators

of development, sex differences in traits and potentially sensitive periods of plasticity. Especially the subjects of normative developmental patterns and sex differences in traits have been well-documented in recent developmental personality research. In addition, these new findings led to a more dynamic view of personality (De Fruyt & Van Leeuwen, 2014) and have been incorporated in current theories on personality development (Specht et al., 2014). This cumulative knowledge from the personality area may guide hypotheses on how SEMS naturally develop and at what time gender differences appear during the life course. Various groups of researchers contributed to document these trajectories and processes. For example, De Fruyt and colleagues (2006) described personality development from childhood to early adolescence, studying parental ratings of 6 to 12 year old children using the Hierarchical Personality Inventory for Children (HiPIC; Mervielde & De Fruyt, 1999). McCrae and colleagues (McCrae et al., 1999; 2005) described in detail trait development in self- and observer ratings of young and older adults across 50 different cultures using the NEO-PI-R (Costa & McCrae, 1992).

Of particular importance for the present study is the work of Soto, John, Gosling, and Potter (2011) who examined personality self-ratings in a very large sample of children, adolescents and adults ( $N=1.267.218$ ; ages 10-65), making it possible to describe in detail developmental trajectories across the life course, including early, middle and late adolescence. Participants were recruited via the World Wide Web and administered the BFI (John, et al., 1991). Each BFI dimension primarily reflects two facets, that are also enclosed in the NEO-PI-R, though the later refers to a broader set with six facets per domain. The BFI Extraversion factor distinguished Assertiveness and Activity, Agreeableness was split into Altruism and Compliance, Conscientiousness grouped Order and Self-discipline items, BFI-Neuroticism bifurcates in Anxiety and Depression, and Openness to experience included an Aesthetics and an Ideas facet.

From a developmental perspective, Conscientiousness' scores decreased from 10 to 13, and started to increase substantially after 15 until 20, followed by a slower increasing linear rate until 45, with consistent though minor increases still thereafter. Gender differences were relatively minor before 20, though women started to score higher after their 20s and this difference remained relatively constant in size until late adulthood. A similar dip, though one year earlier at age 12, is observable for Agreeableness, catching up quickly from 15 to 20, and then gradually slowly increasing until 65. Sex differences emerge clearly at age 20, and very slightly widen throughout development with women obtaining consistently higher scores across

development. Neuroticism starts to increase for girls from 10 reaching a peak at 16-17, followed by a rather stable curve until 30; after their thirties there is a more substantial decrease in Neuroticism scores for women. Although boys obtain, on average, similar scores as girls at age 10, they first demonstrate some decline of neuroticism, until 20, followed by an average relatively stable curve until their fifties, then again followed by a decline. Starting with no difference at 10, gender differences in Neuroticism peak from 15 to 30 years, followed by a gradual decline of the gender difference until 50. Average Extraversion scores show their strongest decline from 10 to 15, with a more outspoken decline for boys. From 15 onwards until 50, Extraversion scores remain largely similar, with girls scoring higher than boys, whereas after 50, this gender difference diminishes. Finally, Openness to experience, after an initial decline until 15 for boys and 19 for girls, starts to show a slow gradual increase thereafter going on until 65, with males scoring higher than females after 15, though females catch up this difference at 55.

The patterns described by Soto and colleagues (2011) replicate to a large extent the general normative change patterns that were reported earlier for young and older adults by McCrae and colleagues (2005) in self- and observer ratings on the NEO-PI-R across 50 different cultures, with a few exceptions. Openness to experience in McCrae et al.'s data (2005) tended to slightly decrease in adulthood, whereas there was no gender difference for conscientiousness in adulthood (2005). De Bolle and colleagues (2015) recently examined the emergence of gender differences in 24 cultures across the five continents, in NEO-PI-3 (McCrae, Costa, & Martin, 2005) observer ratings of adolescents aged 12 to 17. Gender differences in the neuroticism facets N1: Anxiety, N3: Depression, and N6: Vulnerability started to emerge from 14-15 years onwards with girls obtaining higher scores. Girls differed from boys on the Extraversion facets E1: Warmth and E2: Gregariousness from 14 onwards, and also had slightly higher scores on E3: Assertiveness until 16, whereas they had on average lower scores on E3: Assertiveness in adulthood. Girls had consistently higher scores from 12 onwards on the Openness to Aesthetics (O2) and Feelings (O3) facets until adulthood, though the size of this difference diminished from college age. There was no gender difference for Openness to Ideas (O5) until 17, with boys scoring slightly higher from that age. Agreeableness facets showed almost no differences during adolescence, except for A6: Tender-Mindedness that showed consistently higher scores for females from 12 years onwards. Finally, De Bolle et al. (2015) found consistently higher scores for females on five of the six Conscientiousness facets (C2: Order, C3: Dutifulness, C4:

Achievement striving, C5: Self-discipline, and C6: Deliberation), though these differences grossly disappeared after 18 entering adulthood.

### CURRENT STUDY

The present study aims to replicate and extend the findings reported for adolescence by Soto et al. (2011) which is innovative but limited in a number of ways. First, all participants in their study were North-American and spoke English. Clearly, adolescence may unfold rather differently in other countries, cultures, and language communities, thus requiring studies (replication) in other cultural contexts. Second, this very large sample was obtained via the internet, which makes it subject to potential sampling issues: it is likely that this design underrepresents participants with lower SES, lower verbal skills, lower Openness to experience, and possibly boys. In addition, there may have been self-selection effects on personality traits, such that kids “in trouble” (e.g., those with delinquency problems and thus low scores on Conscientiousness and Agreeableness) may not have participated in this volunteer sample.

These issues will be addressed in two separate studies, both recruiting participants through intact school samples and studying a culture rather different from mainstream North-American students, namely Brazil. Brazil is a particularly interesting comparison to investigate whether personality development follows the same pattern discovered in mainstream North-American youth. The experience of later childhood and adolescence in Brazil differs from the USA because of socioeconomic differences (e.g., many adolescents have to help at home and work outside the home to support their families) as well as for historical-structural reasons (e.g., compulsory schooling was introduced more recently and many kids begin school attendance at a later age and attend school for fewer hours per day).

We will present two studies. The first study focuses on changes from late childhood to early adolescence, examining students aged 9 to 12 from the entire Sertãozinho Municipal School District (SMSD). In study 1 three hypotheses will be investigated: (a) Does Conscientiousness decrease during this period? (b) Does Agreeableness decrease during this period? and (c) Does the gender difference in Neuroticism increase, with females increasing more than males? Additionally, we will test whether girls score higher in Agreeableness and in Conscientiousness, as has been found in North American samples. It will be particularly interesting to see how large these effects are and how they compare with the effect sizes in the Soto et al. study (2011). The



SMSD study is limited, however, because the focus on early adolescence does not allow us to test the curvilinear hypothesis, namely that levels of Conscientiousness and of Agreeableness increase again after reaching a low point at age 14 and 13, respectively. This change in the direction of the developmental trend will be tested in an additional large sample of students from the State of Rio de Janeiro. In addition, we will examine whether the gender difference for Extraversion will be observable at age 15, and whether Openness scores show a decreasing pattern until 19 for girls, whereas boys show their lowest level at age 14.

## STUDY 1

### Subjects and method

The SMSD sample was administered to every 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade classroom in the SM School District, and is thus as close to a population sample as possible. A total of 3,769 students (50.4% males) participated, completing the questionnaires with their entire classrooms during a regular class period. The research project was joint collaboration with municipal secretary of education and National Institute of Educational Studies and Research Anísio Teixeira (INEP). An inspection of the ages per grade shows that several students were enrolled in grades designed for younger students, though these probably represent a specific group of students, which is a common problem in classrooms in Brazil. Analyses focused only on those students that were in grades consistent with their chronological age, so findings could be compared to those reported by Soto et al. (2011). This resulted in a sample of N=3022 (47.58% males), distributed across ages as follows: Age 9: 218 boys, 260 girls; Age 10: 461 boys, 510 girls; Age 11: 496 boys, 572 girls, and Age 12: 263 boys, 242 girls. Students were administered a Portuguese version of the BFI (John, et al., 1991) in their regular classrooms during school hours. Given the substantial representation of very young students from lower socio-economic backgrounds and with reading difficulties, we expected low Cronbach alpha reliabilities for the relatively short BFI scales; indeed, alphas were .64, .59, .44, .40, and .55 for Conscientiousness, Agreeableness, Neuroticism, Extraversion and Openness to experience, respectively. In addition, students also completed an inventory assessing demographic and social-economic status variables (including consumer goods they or their family owned).

### Results

The results obtained in Sertãozinho (Table 1) show age ( $F=6.085$ ,  $p < .001$ ) and gender ( $F=50.235$ ,  $p < .001$ ) effects for Conscientiousness, though the interaction was not significant ( $F=0.617$ , ns). A general slightly declining trend in Conscientiousness was observable from 10 to 12 in both boys and girls, with girls reporting higher scores at all ages. For agreeableness, there was no significant age effect ( $F=1.822$ , ns), though there was a gender difference from 9 to 11, with girls scoring higher than boys. The interaction was not significant ( $F=1.326$ , ns). Neuroticism showed significant differences for age ( $F=4.998$ ,  $p < .01$ ) and gender ( $F=27.347$ ,  $p < .001$ ), though their interaction was not significant ( $F=1.107$ , ns). Neuroticism scores went very slightly up from 10 to 12, with girls scoring significantly higher than boys at 10 and 11. Openness showed significant differences for age ( $F=3.952$ ,  $p < .01$ ) and gender ( $F=53.268$ ,  $p < .001$ ), though there was no interaction effect ( $F=1.258$ , ns). There was a slightly declining trend with age, with females scoring higher than boys at age 9 and 10. Finally, for Extraversion, there was only a significant difference for age ( $F=3.755$ ,  $p < .01$ ), with a slightly increasing curve between 10 and 11, but not for gender ( $F=1.545$ , ns) nor their interaction was significant ( $F=1.099$ , ns).

## STUDY 2

### Subjects and method

Participants of this study were a representative sample of students of the state of Rio de Janeiro. The total number of students was  $N=24.605$ . They came from 14 regions, 79 cities, 431 schools and 1062 classes ( $N$  for each class  $M=23$ ,  $SD=7.6$  range 1 to 50). 41.8% were boys and 58.2% girls. As for grade levels there were  $N=1.472$  (6%) from 5th grade,  $N=14.504$  (58.9%) from 10th grade and  $N=8.629$  (35.1%) from 12th grade. The ethnic origin of the students were as follows: 28.9% white, 40.4% pardo (mulatto), 21.1% black, and 5.9% Asiatic. The average ages in each grade were: 5th:  $M=11.9$   $SD=1.46$ ; 10th:  $M=16.45$   $SD=1.05$  and 12th:  $M=18.21$ ,  $SD=1.02$ . The students of the 5th grade answered the short 62-item form of SENNA 1.0 and the remaining students answered the extended 92-item form of SENNA.

For the present analyses, data from  $N=23.769$  students (41.63% males) were available. Like in sample 1, many students were enrolled in grades with atypical ages, so these were excluded from the subsequently reported analyses. This resulted in a final sample of  $N=20.666$  (39.81% of males), distributed across ages as follows: Age 10: 44 boys, 71 girls; Age 11: 242

boys, 322 girls; Age 15: 732 boys, 1246 girls; Age 16: 2747 boys, 4070 girls; Age 17: 556 boys, 1001 girls; and Age 18: 1725 boys, 2828 girls.

## Results

Given the small the number of students in the age category of 10, students of 10 and 11 were assigned to a single group for making statistical comparisons. Moreover, given the absence of data for the age groups 12 to 14, statistical comparisons were only made for the age groups 10-11, 15 and 18. The data obtained in Rio de Janeiro showed (Table 2) clear age ( $F=96.521$ ,  $p < .001$ ) and gender ( $F=42.091$ ,  $p < .001$ ) effects for Conscientiousness, though their interaction was not significant ( $F=.101$ , ns). The difference between students in the group 10-11 and 15 was significant, with those at age 15 scoring lower; from 15 to 18, there was a significant decrease. Girls obtained higher Conscientiousness scores at both 15 and 18. Agreeableness showed age ( $F=11.71$ ,  $p < .001$ ), gender ( $F=631.27$ ,  $p < .001$ ) and interactive ( $F=17.09$ ,  $p < .001$ ) effects, with females consistently higher across ages. The curve for females stayed more flat from 15 to 18, and the gender difference was largest at 11. Neuroticism scores showed age ( $F=19.608$ ,  $p < .001$ ), gender ( $F=57.222$ ,  $p < .001$ ) and interactive ( $F=5.156$ ,  $p < .001$ ) effects. At 10-11, there was no significant gender difference, though from 15 to 18 girls showed consistently higher Neuroticism scores, with a declining trend from 15 to 18 for girls. Openness showed a significant age effect ( $F=20.255$ ,  $p < .001$ ), no main gender effects ( $F=2.861$ , ns), but there was a significant interaction between gender and age ( $F=2.172$ ,  $p < .01$ ). Openness slightly increased from 15 to 18, with boys slightly higher at 18. For Extraversion, there were significant age ( $F=19.307$ ,  $p < .001$ ), gender ( $F=18.071$ ,  $p < .001$ ) and interactive ( $F=8.292$ ,  $p < .001$ ) effects. Extraversion was higher at 15 than at 10-11, especially for girls, and there was only a significant gender effect at 15, with girls scoring higher.

## GENERAL DISCUSSION

The purpose of the present research was to replicate findings reported by Soto et al. (2011) on age and gender differences on the big five personality factors in 2 samples that were independently collected in students aged 9 to 12 (Sertaosinho) and Rio de Janeiro (10-11, 15 to

18). Although both samples had their limitations, especially in terms of the age distributions, several meaningful comparisons could be made.

Regarding normative age trends, the inverted U-shape trend with a bottom at age 13 for Conscientiousness was clearly present when we interpret trends across the two samples. The Sertaosinho data showed a decline from 10 to 12, whereas the Rio data clearly showed that the group 10-11 and those of 18 scored higher than the 15 year olds. The one-year earlier inverted U-shape curve for Agreeableness described by Soto et al. (2011) was not observable in Sample 1 (no significant decline from 10 to 14), and could not be reliably traced in the Rio data, given the small number of students at age 10. The divergent age patterns in adolescence reported by Soto et al. (2011) for Neuroticism between boys and girls could be also observed in our two samples, with scores for girls increasing especially in early adolescence. Extraversion in Soto and colleagues (2011) work declined in adolescence, though showed an increasing trend from 10 to 11 in the Sertaosinho data, and significantly higher scores for the 15 year olds versus those in the 10-11 group in Rio. Finally, Soto and colleagues (2011) reported a declining tendency for Openness in adolescence for girls, whereas boys initially declined, though showed an increase and higher scores than females from 16 onwards. An overall decline in early adolescence was observed in the Sertaosinho data, paralleling Soto et al. (2011), whereas an overall increase from 15 to 18 was seen in the Rio data, again in line with the findings for boys described by Soto et al. (2011), but not for girls.

Regarding gender differences, the observations by Soto et al. (2011) were generally well replicated for Conscientiousness, Agreeableness and Neuroticism, with girls obtaining higher scores in adolescence. For extraversion, no gender differences were observed in Sertaosinho, whereas those found in Rio were in line with the higher scores observed by Soto et al. (2011) for girls. Finally, also the gender effects for Openness to experience were to a large extent replicated, with girls higher on openness during early adolescence, whereas boys scored higher in late adolescence.

Overall, the present results show that normative developmental patterns and gender differences observed in North America largely generalize and are similar to patterns observed in large-scale research conducted with more representative samples in Brazil. These findings add to the cross-cultural studies on these themes conducted by McCrae et al. (2005), De Fruyt et al. (2009) and De Bolle et al. (2015) who reported similar generalizable findings. The current data

substantially add to this knowledge database, because the current samples are more representative of a region, whereas previous work used convenience or internet/volunteer samples that may show divergent characteristics. An additional strength is that we used different inventories to assess SEMs, either the BFI (in Sertãozinho) or SENNA 1.0 (Rio). Recall that the SENNA inventory, was developed bottom-up within the Brazilian school context, so replication of findings using such measure is extremely encouraging.

Despite some strengths, the current studies also have their limitations. A first major constraint is that both samples do not cover the entire adolescent age range, enabling only a partial examination of the developmental patterns described by Soto and colleagues (2011). New research should cover the entire age-range so we are in a better position to examine the curvilinear effects. A second potential limiting factor is that students were excluded who were enrolled in grades not in line with their chronological age. It was decided not to take them into account, because their numbers were quite high and it could be expected that they had a different standing on personality traits than students who were enrolled 'on time'. The Soto et al. (2011) sample, however, probably also included a portion of such subjects, though proportionally probably not that much. To the extent that Soto et al.'s sample included 'late' students, developmental patterns from our samples are less comparable to Soto et al.'s findings.

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Table 1. SEMS means and standard deviations Study 1 (Sertaosinho)

<b>Factor</b>	<b>Sex</b>	<b>Age</b>			
		<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
Conscientiousness	Male	3.41 (.55)	3.44 (.57)	3.39 (.56)	3.35 (.57)
	Female	3.61 (.56)	3.59 (.57)	3.52 (.57)	3.46 (.56)
Openness to Experience	Male	3.65 (.61)	3.59 (.61)	3.60 (.58)	3.55 (.57)
	Female	3.79 (.53)	3.81 (.60)	3.72 (.58)	3.68 (.57)
Neuroticism	Male	2.89 (.62)	2.90 (.63)	2.93 (.64)	2.99 (.63)
	Female	2.92 (.68)	3.04 (.66)	3.07 (.70)	3.14 (.61)
Agreeableness	Male	3.74 (.69)	3.77 (.62)	3.79 (.62)	3.73 (.69)
	Female	3.98 (.57)	3.99 (.64)	3.91 (.65)	3.89 (.62)
Extroversion	Male	3.36 (.60)	3.34 (.63)	3.37 (.60)	3.43 (.57)
	Female	3.35 (.62)	3.34 (.60)	3.45 (.64)	3.42 (.63)

Table 2. SEMS means and standard deviations Study 2 (Rio de Janeiro)

Factor	Sex	Age								
		10	11				15	16	17	18
Conscientiousness	Male	3.64 (.56)	3.56 (.68)				3.19 (.66)	3.22 (.65)	3.28 (.65)	3.31 (.64)
	Female	3.75 (.68)	3.68 (.69)				3.28 (.67)	3.31 (.67)	3.40 (.65)	3.41 (.62)
Openness to Experience	Male	3.45 (.61)	3.31 (.73)				3.36 (.62)	3.35 (.64)	3.52 (.62)	3.51 (.60)
	Female	3.25 (.76)	3.37 (.68)				3.41 (.59)	3.37 (.61)	3.50 (.58)	3.44 (.58)
Neuroticism	Male	2.68 (.61)	2.65 (.61)				2.48 (.65)	2.49 (.66)	2.52 (.65)	2.47 (.67)
	Female	2.79 (.60)	2.85 (.68)				3.03 (.78)	2.98 (.76)	2.91 (.74)	2.89 (.74)
Agreeableness	Male	3.53 (.66)	3.44 (.57)				3.59 (.49)	3.59 (.53)	3.69 (.49)	3.68 (.50)
	Female	3.71 (.55)	3.67 (.56)				3.70 (.52)	3.71 (.52)	3.73 (.49)	3.75 (.48)
Extroversion	Male	3.55 (.45)	3.47 (.54)				3.52 (.56)	3.55 (.58)	3.63 (.55)	3.62 (.56)
	Female	3.35 (.59)	3.52 (.54)				3.67 (.59)	3.65 (.58)	3.64 (.61)	3.64 (.57)
External Locus of Control + Negative Valence	Male	2.59 (.60)	2.53 (.56)				2.20 (.51)	2.20 (.51)	2.08 (.48)	2.07 (.50)
	Female	2.41 (.67)	2.41 (.55)				2.17 (.53)	2.15 (.52)	2.04 (.49)	2.02 (.46)