The effects of birth order on five-factor personality traits in early adolescents

Jasna HUDEK-KNEZEVIC\textsuperscript{a1}, Igor KARDUM\textsuperscript{b}, Nada KRAPIC\textsuperscript{c}

\textsuperscript{a}University of Rijeka, Faculty of Humanities and Social Sciences, Department of Psychology, Sveučilsna avenija 4, Rijeka, Croatia, e-mail: hudekj@ffri.hr
\textsuperscript{b}University of Rijeka, Faculty of Humanities and Social Sciences, Department of Psychology, Sveučilsna avenija 4, Rijeka, Croatia, e-mail: kardum@ffri.hr
\textsuperscript{c}University of Rijeka, Faculty of Humanities and Social Sciences, Department of Psychology, Sveučilsna avenija 4, Rijeka, Croatia, e-mail: nkrapic@ffri.hr

Abstract

On the sample of 952 early adolescents we examined the effects of birth order on five-factor personality traits by using between-family design. Four most frequent classifications of birth order were used and their effects were examined not only on primary five-factor personality traits, but also on two higher-order meta-traits, stability and plasticity, as well as general factor of personality. Additionally, a number of potentially important sociodemographic variables which may confound the relationship between birth order and personality were controlled for. The results of this study show that birth order exerted no effects on the conscientiousness and openness, while on extraversion, agreeableness, emotional stability, higher order plasticity dimension and general personality factor a few differences with small effect sizes were obtained. When sociodemographic variables were controlled for, relationships between birth order and five-factor personality traits were not changed. The analyses of trends show that extraversion, openness, agreeableness, higher-order plasticity dimension and general factor of personality exhibited quadratic, while neuroticism and higher-order stability dimension linear trend. The results are somewhat different depending on the birth order classification and they suggest that the most informative classification are more detailed one.

Keywords: birth order, personality traits, early adolescence, family niche theory

1. Introduction

The effects of birth order on personality have been studied for several decades with controversial results. After reviewing more than 1000 studies on this topic published before 1981 Ernst and Angst [1] concluded that “[birth] order does not appear to be a very strong influence in molding personality in a definable way” (p. 187). However, new theoretical and methodological advances revitalized the interest for this research topic. Theoretical impetus for research was given by Sulloway [2], who proposed family niche theory of birth-order effects based on Darwin’s principle of divergence. Consistent with evolutionary theory, he argued that children compete for parental resources by adapting to divergent roles within the family system, thus creating distinctive niches which reduce competition and facilitate cooperation, potentially enhancing a sibship’s fitness. Therefore, a position of a child within a family is assumed to create stable differences in its personality traits. For example, firstborns, in order to protect their favored status, tend to be more susceptible to authority, more conscientious,

\footnote{\textsuperscript{1} Corresponding author}
achievement-oriented, conforming and traditional. On the other hand, laterborns, who are in competition with older siblings, try to maximize parental investment by being more open to experiences, playful, unconventional, cooperative, and rebellious [3]. It should be noted that Sulloway’s theory is consistent with contemporary knowledge about the development of personality traits. Namely, birth order distinguishes children in a family, and behavior genetic studies of personality typically indicate to the importance of nonshared environment[4].

Regarding the effects of birth order on personality by using a standard personality taxonomy like five-factor model, Sulloway conducted two important meta-analyses. A meta-analysis comprising 188 between-family studies showed significant birth order trends for all five personality dimensions, after the difference in sibship size and social class have been controlled for [5]. The results showed that firstborns achieve higher scores on conscientiousness, and to a lesser degree on neuroticism, while laterborns on agreeableness, extraversion and openness to experience. A meta-analysis of studies based on direct sibling comparisons (within-family studies) yielded similar results with those obtained using comparisons between families [3]. Firstborns were rated by themselves and their sibling as being more conscientious than laterborns, while laterborns were rated as being more extraverted, agreeable and open to experiences.

Other studies testing Sulloway’s hypotheses yielded equivocal results. For example, Paulhus, Trapnell and Chen [6], using within-family design on different samples, found that firstborns are more conscientious and achievement oriented, while laterborns are more rebellious, liberal and agreeable. Three studies by Jefferson, Herbst and McCrae [7] showed small effects of birth order on agreeableness facets, altruism and tender-mindedness, on which laterborns have higher scores than firstborns. Additionally, when rated by friends, neighbours and co-workers, but not by spouses, laterborns are more open to experience and agreeable than firstborns. By using different classification of birth-order, Saroglou and Fiasse [8] found that middleborns compared with firstborns and lastborns are the lowest on conscientiousness, and the highest on impulsiveness and openness to fantasy and values, while lastborns are the highest on agreeableness and warmth compared to first and middleborns.

On the other hand, some studies did not find association between birth order and any of the five factor personality traits [e.g. 9-12]. Similarly, analysing large datasets from three national panels, Rohrer, Egloff and Schmukle [13] found that firstborns score higher on objectively measured intelligence and self-reported intellect, but no birth-order effects were found on extraversion, emotional stability, agreeableness, conscientiousness and imagination.

Except on five-factor model, Sulloway’s hypotheses have been also tested on some other personality traits and behavioral measures. For example, Michalski and Shackelford [14] did not find any differences between firstborns and laterborns on sociosexuality, which is not in accord with Sulloway’s hypotheses. However, according to his hypotheses, laterborns reported a desire for more sexual partners in future, while firstborns wanted children at an earlier age. Contrary to Sulloway’s hypotheses, Buunk [15] found that laterborns are more jealous than firstborns. Furthermore, birth order was not linked to shyness and sensation seeking [16]. Concerning relations between birth order and behaviors, laterborns were found to be more frequently incarcerated because of civil disobedience than firstborns [17 but see 18], and laterborn major league baseball players are more prone to risk taking than firstborn players [19].

To sum up, previous studies have not always obtained differences in personality traits regarding birth order, but when these differences are found they are relatively small [see 20] and frequently in accord with Sulloway’s hypotheses. The strongest effects of birth order were obtained for conscientiousness, agreeableness and openness, and the weakest for neuroticism.

There are various reasons why research results are not consistent. Firstly, the use of different research designs (i.e. within- or between-family) and data sources (i.e. self-reports or other-reports), aggravate the comparison of the results between studies. Another limitation is the use of different classifications of birth order. For example, in Sulloway’s studies [5, 2, 21, 3] birth order has been used as a dichotomous variable (i.e., firstborns vs. laterborns), which does not take into account possible differences between firstborns that are only children and those that have siblings. Similarly, a category of laterborns does not differentiate between secondborns and middleborns. Further, the limitation of
some studies is that they do not consider the important confounds such as some sociodemographic variables. For example, because large sibships are prevalent in lower-class families, they are biased for an overrepresentation of laterborns [3].

The aim of this study was to test Sulloway’s hypotheses about the effects of birth order on five-factor personality traits on the sample of early adolescents by trying to take into consideration some of the aforementioned issues. Firstly, in the present between-family study we used relatively large sample of participants that enables the identification of small effect sizes. Additionally, this study was conducted on early adolescents, which may help to better understand the developmental processes related to birth order differences in personality traits. Namely, as the majority of previous studies on this topic used adult samples, there is a lack of knowledge about the onset of the differences in personality traits regarding birth order. Furthermore, we controlled a number of potentially important sociodemographic indices which may confound the relationship between birth order and personality. Also, the present study used four most frequent classifications of birth order. Along with Sulloway’s classification which differentiates between first and laterborns, three other birth order classifications were used. The most detailed one differentiates between only children, firstborns, secondborns and thirdborns. Two other classifications are its derivatives, one comprising firstborns, middleborns and lastborns and the other only children, firstborns and laterborns. Regarding personality, five-factor personality taxonomy was used, along with the two higher-order meta-traits, stability (agreeableness, conscientiousness and emotional stability) and plasticity (extraversion and openness) as well as general factor of personality, which has recently been hypothesized to occupy the apex of the hierarchy of personality [22, 23].

2. Method

2.1. Participants and procedure

The study was carried out on the representative sample of 952 students (473 girls and 479 boys) from fifth to eight grades of primary school (11 to 16 years; M = 13.31; SD = 1.22). The number of participants in the analyses varies due to partially missing data. In order to obtain representative sample of participants, 11 out of 60 primary schools from one county, as well as classes within the schools were selected by using simple random sampling method. The questionnaires were administered during school hours after obtaining written consent from participants and their parents to whom complete anonymity was guaranteed. This procedure was approved by the County Department of Education, as well as Ethics Committee of the Department of Psychology.

2.2. Instruments

Big five personality dimensions were measured by an instrument constructed from adjectives describing various personality traits in the Croatian language [24]. Twenty five adjectives (5 for each dimension) were chosen for the purpose of the present study. All dimensions of the five-factor model were covered and could be easily understood by primary school children. With each adjective, a 5-point rating scale was used (1 – I am never like that, 5 – I am always like that). Confirmatory factor analysis yielded results consistent with five-factor structure [25]. Table 1 shows means, standard deviations, Cronbach alpha reliability coefficients and correlations between five-factor personality traits.
The correlations obtained show moderate positive relationship between extraversion, agreeableness, conscientiousness and openness, while neuroticism was completely independent from other four traits. From five primary traits higher order plasticity (Extraversion and Openness), and stability dimensions (Agreeableness, Conscientiousness and Emotional Stability), as well as one general personality factor were computed using standardized values. Various sociodemographic characteristics of participants (parents’ marital status, mother’s and father’s level of education, estimated family economic status, number of siblings and total number of family members), along with birth order were also collected.

3. Results

Since dependant variables are correlated (Table 1), the differences on five-factor personality traits regarding birth order were firstly analyzed by multivariate analysis of variance. In Table 2 means and standard deviations of the five-factor personality traits for all birth order classifications analyzed are presented.

Regarding first classification, significant multivariate main effect of birth order on personality traits was obtained (Wilks’ lambda = 0.966; p = 0.007; partial $\eta^2 = 0.01$), with significant differences for extraversion ($F_{3,913} = 2.89; p = 0.035$; partial $\eta^2 = 0.01$), agreeableness ($F_{3,913} = 2.85; p = 0.036$; partial $\eta^2 = 0.01$) and neuroticism ($F_{3,913} = 3.77; p = 0.010$; partial $\eta^2 = 0.01$). Since there was a large difference between groups in the number of participants, and covariance matrices between the groups were significantly different (Box’s M = 69.68; p = 0.013), we used Games-Howell post-hoc test, which does not assume equal variances across groups or equal sample sizes, and is good for controlling Type 1 error. Games-Howell test revealed that only children (M = 20.76) are significantly more extraverted than firstborns (M = 20.04) (p = 0.05). Furthermore, thirdborns (M = 21.05) are significantly more agreeable than firstborns (M = 20.09) (p = 0.03), and that thirdborns (M = 14.80) are more neurotic than only children (M = 13.25) (p = 0.012) and firstborns (M = 13.62) (p = 0.034). A significant linear trend was obtained for neuroticism (p = 0.002), and significant quadratic trend for extraversion (p = 0.019), agreeableness (p = 0.005) and openness (p = 0.010).

Differences on five-factor personality traits regarding birth order were also explored by a set of multivariate analyses of covariance. Variables assumed to affect the relationship between birth order and personality traits were included as covariates. Participants’ gender (Wilks’ lambda = 0.919; p < 0.001), age (Wilks’ lambda = 0.982; p = 0.006), parents’ marital status (Wilks’ lambda = 0.980; p = 0.003), father’s level of education (Wilks’ lambda = 0.980; p = 0.003), mother’s level of education (Wilks’ lambda = 0.981; p = 0.005) and family economic status (Wilks’ lambda = 0.983; p = 0.011) had significant multivariate effects on personality traits, while the effects of number of siblings (Wilks’ lambda = 0.993; p = 0.289) and total number of family members (Wilks’ lambda = 0.996; p = 0.681) were not significant. However, by controlling each covariate separately as well as simultaneously, no changes of aforementioned relationships between birth order and five-factor personality traits were obtained.
Multivariate analysis of variance revealed that birth order classification that includes firstborns and laterborns had also significant multivariate effect on personality traits (Wilks’ lambda = 0.986; p = 0.026; partial $\eta^2 = 0.01$). Significant difference was found only for neuroticism ($F_{1,933} = 7.79; p = 0.035; partial \eta^2 = 0.01$), with laterborns ($M = 14.18$) having higher scores than firstborns ($M = 13.50$) ($p = 0.005$).

Birth order classification which includes firstborns, middleborns and lastborns did not yield significant multivariate effect on personality traits (Wilks’ lambda = 0.984; p = 0.135; partial $\eta^2 = 0.01$). Significant univariate effect was found for neuroticism ($F_{2,911} = 3.99; p = 0.019; partial \eta^2 = 0.01$), showing the difference between firstborns ($M = 13.50$) and lastborns ($M = 14.20$) ($p = 0.02$). Significant linear trend was obtained on this trait, with an increase in mean scores from firstborns to lastborns ($p = 0.006$).

The results of the last classification showed significant multivariate effect of birth order on personality traits (Wilks’ lambda = 0.975; p = 0.011; partial $\eta^2 = 0.01$), with significant univariate effects obtained for extraversion ($F_{2,911} = 3.71; p = 0.025; partial \eta^2 = 0.01$) and neuroticism ($F_{2,911} = 4.47; p = 0.012; partial \eta^2 = 0.01$). Significant quadratic trend was obtained for extraversion ($p = 0.007$), with Games-Howell post-hoc test showing only significant difference between only children ($M = 20.76$) and firstborns ($M = 20.04$) ($p = 0.03$). Significant linear trend was obtained for neuroticism ($p = 0.007$), and Games-Howell post-hoc test shows significant difference only between only children ($M = 13.25$) and laterborns ($M = 14.19$) ($p = 0.03$). Table 3 presents means and standard deviations of higher-order plasticity and stability dimensions as well as general factor of personality for all birth order classifications analyzed.
Table 2. Means and standard deviations of five-factor personality traits for different birth order classifications

<table>
<thead>
<tr>
<th>BIRTH-ORDER CLASSIFICATION</th>
<th>E</th>
<th>A</th>
<th>C</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Only children (N=146)</td>
<td>20.76</td>
<td>2.50</td>
<td>20.66</td>
<td>2.90</td>
<td>19.34</td>
</tr>
<tr>
<td>Secondborns (N=372)</td>
<td>20.45</td>
<td>2.87</td>
<td>20.27</td>
<td>2.88</td>
<td>18.92</td>
</tr>
<tr>
<td>Thirdborns (N=74)</td>
<td>20.88</td>
<td>2.75</td>
<td>21.05</td>
<td>2.59</td>
<td>19.39</td>
</tr>
<tr>
<td>Firstborns (N=468)</td>
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<td>3.17</td>
<td>20.27</td>
<td>3.06</td>
<td>19.25</td>
</tr>
<tr>
<td>Laterborns (N=466)</td>
<td>20.52</td>
<td>2.87</td>
<td>20.35</td>
<td>2.85</td>
<td>19.02</td>
</tr>
<tr>
<td>Firstborns (N=468)</td>
<td>20.27</td>
<td>3.17</td>
<td>20.27</td>
<td>3.06</td>
<td>19.25</td>
</tr>
<tr>
<td>Middleborns (N=60)</td>
<td>20.18</td>
<td>3.23</td>
<td>20.08</td>
<td>3.14</td>
<td>18.78</td>
</tr>
<tr>
<td>Lastborns (N=384)</td>
<td>20.57</td>
<td>2.78</td>
<td>20.43</td>
<td>2.82</td>
<td>19.04</td>
</tr>
<tr>
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<td>2.50</td>
<td>20.66</td>
<td>2.90</td>
<td>19.34</td>
</tr>
<tr>
<td>Laterborns (N=446)</td>
<td>20.52</td>
<td>2.85</td>
<td>20.40</td>
<td>2.85</td>
<td>19.00</td>
</tr>
</tbody>
</table>

Note. M – Mean; SD – Standard deviation; E – Extraversion; A – Agreeableness; C – Conscientiousness; N – Neuroticism; O – Openness.
Table 3. Means and standard deviations of higher-order personality dimensions and general factor of personality for different birth order classifications

<table>
<thead>
<tr>
<th>BIRTH ORDER CLASSIFICATION</th>
<th>PLASTICITY</th>
<th>STABILITY</th>
<th>GENERAL FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Only children (N=146)</td>
<td>0.12</td>
<td>0.71</td>
<td>0.12</td>
</tr>
<tr>
<td>Firstborns (N=322)</td>
<td>-0.07</td>
<td>0.93</td>
<td>0.02</td>
</tr>
<tr>
<td>Secondborns (N=372)</td>
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<td>0.82</td>
<td>-0.03</td>
</tr>
<tr>
<td>Thirdborns (N=74)</td>
<td>0.22</td>
<td>0.86</td>
<td>0.03</td>
</tr>
<tr>
<td>Firstborns (N=468)</td>
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<td>0.87</td>
<td>0.05</td>
</tr>
<tr>
<td>Laterborns (N=466)</td>
<td>0.05</td>
<td>0.83</td>
<td>-0.02</td>
</tr>
<tr>
<td>Firstborns (N=468)</td>
<td>-0.01</td>
<td>0.87</td>
<td>0.05</td>
</tr>
<tr>
<td>Middleborns (N=60)</td>
<td>-0.07</td>
<td>0.83</td>
<td>-0.07</td>
</tr>
<tr>
<td>Lastborns (N=384)</td>
<td>0.07</td>
<td>0.83</td>
<td>-0.01</td>
</tr>
<tr>
<td>Only children (N=146)</td>
<td>0.12</td>
<td>0.71</td>
<td>0.12</td>
</tr>
<tr>
<td>Firstborns (N=322)</td>
<td>-0.07</td>
<td>0.93</td>
<td>0.02</td>
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<tr>
<td>Laterborns (N=446)</td>
<td>0.05</td>
<td>0.83</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

Note: M – Mean; SD – Standard deviation.

First classification yielded significant multivariate main effect of birth order (Wilks’ Lambda = 0.983, $F_{6,913} = 2.60$, $p = 0.016$, partial $\eta^2 = 0.01$), with significant univariate effects found only for plasticity ($F_{3,913} = 3.15$, $p = 0.02$, partial $\eta^2 = 0.01$). Significant quadratic trend was obtained ($p = 0.005$), with post-hoc test showing that only children have higher scores ($M = 0.12$) than firstborns ($M = -0.07$) on this dimension ($p = 0.05$).

Second classification yielded also significant multivariate main effect (Wilks’ Lambda = 0.992, $F_{2,933} = 3.63$, $p = 0.027$, partial $\eta^2 = 0.01$), but no significant univariate effects were obtained. Third classification yielded no significant multivariate main effect of birth order (Wilks’ Lambda = 0.991, $F_{4,913} = 2.13$, $p = 0.074$, partial $\eta^2 = 0.005$).

Fourth classification yielded significant multivariate main effect of birth order (Wilks’ Lambda = 0.987, $F_{4,913} = 3.01$, $p = 0.017$, partial $\eta^2 = 0.007$), with marginal significant difference obtained for plasticity ($F_{2,913} = 2.94$, $p = 0.053$, partial $\eta^2 = 0.006$). Post-hoc test shows that only children have higher scores ($M = 0.12$) than firstborns ($M = -0.07$) on this dimension ($p = 0.046$). Significant quadratic trend was obtained for plasticity ($p = 0.015$), and significant linear trend for stability ($p = 0.020$).

Regarding general factor of personality, first classification yielded significant main effect ($F_{3,913} = 2.65$, $p = 0.048$, partial $\eta^2 = 0.01$). Post-hoc test shows that only children have higher scores ($M = 0.24$) than firstborns ($M = -0.05$) ($p = 0.05$), with significant quadratic trend ($p = 0.007$). Second ($F_{1,913} = 0.036$, $p = 0.85$, partial $\eta^2 = 0.00$), as well as third classification ($F_{2,913} = 0.64$, $p = 0.53$, partial $\eta^2 = 0.001$) did not yield significant main effects.

Considering fourth classification, near significant main effect was obtained ($F_{2,913} = 2.63$, $p = 0.073$, partial $\eta^2 = 0.006$). Post-hoc test shows that only children have higher scores ($M = 0.24$) than firstborns ($M = -0.05$) ($p = 0.045$). Significant quadratic trend was obtained ($p = 0.049$). Figure 1 summarises the results of this study obtained by using four birth order classifications and three different levels of personality hierarchy.
Fig. 1. Summary of the trends and differences in personality traits, higher-order meta-traits and general personality factor regarding four birth order classifications.

Note. E – Extraversion; A – Agreeableness; C – Conscientiousness; N – Neuroticism; O – Openness; GFP – General factor of personality; OC – only children; FB – firstborns; TB – thirdborns; LtB – laterborns; LsB – lastborns; 1., 2., 3., 4. – classifications of birth order (1. – only children, firstborns, secondborns, thirdborns; 2. – firstborns, laterborns; 3. – firstborns, middleborns, lastborns; 4. – only children, firstborns, laterborns)

4. Discussion

The present study tested the effects of birth order on five-factor personality traits using sample of early adolescents. Different classifications of birth order were employed, and their effects analyzed on the level of primary five-factor personality traits, their higher-order meta-traits as well as general personality factor. Additionally, a number of important sociodemographic variables that could be involved in the relationship between birth order and personality were controlled for.

Regarding primary factors of personality, the results show that birth order has no effects on the conscientiousness and openness, while on extraversion, agreeableness and emotional stability a few differences with small effect sizes were obtained. Only children achieve higher scores than firstborns on extraversion, thirdborns reported higher scores than firstborns on agreeableness, while the effects of birth order could be most clearly seen on emotional stability, with a clear linear trend of its decrease from only children and firstborns toward laterborns. Depending on birth order classification our results show that only children and firstborns are more emotionally stable than thirdborns, firstborns are more emotionally stable than laterborns and lastborns, and only children are more emotionally stable than laterborns. Additionally, controlling for each sociodemographic variable separately and simultaneously, we did not obtain any changes in the relationship between birth order and five-factor personality traits.

When higher-order meta-traits are taken into consideration, the differences were observed only on plasticity dimension, with only children being higher on this dimension than firstborns, which reflects the difference obtained on extraversion trait. Also, this is the only difference obtained on the level of general personality factor.

Previous research has shown that birth order effects in personality sometimes exhibit linear and sometimes quadratic trends [3]. According to Sulloway’s theory, linear trend reflects the process related to dominance hierarchies among siblings. Namely, older children, as well as males and larger
children are more dominant and often use power to get more resources within the family, which influence sibling interactions and the development of personality. On the other hand, quadratic trend reflects two processes. One of them concerns disparities in parental investment because investment in middleborns is more often lesser than in firstborns and lastborns. The other process is sibling deidentification, which means that siblings who are closer in birth order will try to differentiate themselves from the first next sibling [3]. The analyses of trends obtained in the present study show that extraversion, openness, agreeableness, higher-order plasticity dimension, and general factor of personality exhibited quadratic, while neuroticism and higher-order stability dimension linear trend.

Previous results regarding the effects of birth order on extraversion are mixed, sometimes showing that firstborns are more extraverted than laterborns and sometimes vice versa [5, 3]. Some of the reasons for these conflicting results might be the use of the measures containing different components of extraversion. For example, firstborns were found to be more assertive and likely to exhibit leadership qualities than laterborns, while laterborns were found to be more affectionate, fun-loving and sociable than firstborns [5, 3], all of them being the components of broadly defined extraversion trait. It should be noted that our results are not directly comparable to the previous studies, because the only difference obtained here concerns the one between only children and firstborns, which is the classification rarely used in previous research. This difference as well as quadratic trend obtained for extraversion, may suggest that higher extraversion has different function for only children than for laterborns. Extraversion in only children may reflect child’s dominant position within a family, and could also facilitate socializing with peers outside the family. On the other hand, extraversion in laterborns may reflect their richer experience with older siblings as well as their striving for the status and resources. Consequently, firstborns could have the lowest level of extraversion because their status within family and the possibility to gain parental resources are threatened to a lesser degree than in laterborns.

Furthermore, the results of this research show that thirdborns are more agreeable than firstborns which is generally in accord with the previous studies. Being agreeable, i.e. easy going, unassertive, modest, tender-minded and trusting, is an effective strategy that help in gaining better status within a family, especially for someone who is smaller and less powerful. In accord with Sulloway’s theory and previous research, it was expected that firstborns are more conscientious and laterborns more open, which was not confirmed in our study. One possible reason is that these differences develop later in life, which could not be identified in early adolescence, and the other concerns possible cultural differences. However, these possibilities should be addressed in future research. Previous results regarding neuroticism are equivocal. The present study obtained clear linear trend, showing the increase in neuroticism from only children to thirdborns. In other words, better position in status and parental resources may lead to higher emotional stability.

To conclude, our findings show once again that the effects of birth order on personality traits are relatively small and developed early, at least in early adolescence. Additionally, they could be observed on all levels of personality hierarchy analyzed, from five primary factors through two higher-order meta-trait to the general personality factor. Also, the results of this study suggest that more detailed classification of birth order is more appropriate, because some important differences between categories which do not appear in other birth order classifications have been obtained (e.g. between only children and firstborns). Despite the fact that our results did not show the effects of the analyzed sociodemographic variables on the relationship between birth order and personality traits, it should be noted that their effects may be more complex (e.g. interactive). For example, if a secondborn child is a male, his striving for family status and parental resources would probably be different depending on the age and gender of the older sibling. In this sense, the research concerning the effects of sociodemographic effects on the relationship between birth-order and personality should be more theory driven, and include the processes suggested by some other theoretical approaches [e.g. Trivers-Willard hypothesis, 26]. Additionally, future research should take into account other data sources (e.g. peer and parental reports), and research designs (e.g. within-family design) as well as more contextualized personality variables [10].

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