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The General Factor of Personality (GFP) and parental support: testing a prediction from Life History Theory

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Abstract

In the present study, we tested whether the General Factor of Personality (GFP) is related to the level of parental support. The GFP is assumed to occupy the apex of the hierarchy of human personality structure and is believed to reflect a socially and sexually selected aggregate of behavioral characteristics that are generally valued as "desirable" in interpersonal relationships. The relationship between the GFP and parental support tested in this study is predicted by Life History Theory, a midlevel evolutionary account of systematic differences in evolved reproductive strategies. A total of 428 families with mother, father, and two children (range 14–16 years) participated. Parents filled out personality questionnaires (Big Five) and their level of parental support. The children also independently rated the amount of support they perceived from their parents. In the present sample, parents' GFPs were found to explain 33% of the variance in the Big Five. Moreover, the parents' GFPs showed significant relationships with the parents' self-rated parental support, but also with the child-rated parental support. The monoinformant (parents ratings) and multi-informant (parent and child ratings) data support the notion of a substantive GFP that is related to the investment of parents into their offspring.

Keywords: General Factor of Personality; Life History Theory; Parental support; Big Five

1. Introduction

Personality plays an important role in studies on human behavior as it is believed to affect how individuals interact with others and how they approach a wide range of different situations. In evolutionary psychology the relevance of personality has also been acknowledged because it may affect the differential survival and reproduction of individuals (Buss, 1991). For example, certain personality profiles may enhance one's mate value and thus increase the probability of leaving high-quantity or -quality offspring (Figueredo, Sefcek, & Jones, 2006). Much of the research on personality has focused on well-known models such as the Eysenck' (1967) Psychotism, Extraversion, Neuroticism model, Gray's (1990) Behavioral inhibition and approach model, or the Big Five (Goldberg, 1981). The latter is a psychometric theory about personality stating that most individual differences in character can be described by Openness to experience, Conscientiousness, Extraversion, Agreeableness (or Altruism), and Neuroticism.

Recently however, several researchers have emphasized that a general factor can be found in various personality measures and that this General Factor of Personality (GFP) is related to evolutionary selective forces (e.g., Musek, 2007; Rushton & Irwing, 2011; Rushton, Bons, & Hur, 2008). The GFP is assumed to occupy the apex of the hierarchical structure of personality, thereby leading to correlations among many of the lower-order traits. The existence of a general factor in personality measures has already been proposed more than a century ago and has occasionally been mentioned in the literature since then. More recently, the general factor has been put into the center stage of research again (Musek, 2007) and has now been replicated in

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numerous studies, including several large meta-analyses (e.g., Rushton & Irwing, 2011; Van der Linden, Te Nijenhuis, & Bakker, 2010; Veselka, Schermer, Petrides, & Vernon, 2009). Individuals scoring high on the GFP are assumed to possess a mix of socially desirable traits and can be described as open minded, hardworking, sociable, friendly, and emotionally stable (Figueredo et al., 2006; Rushton et al., 2008). Currently, the literature provides different interpretations of the GFP. One interpretation is that the construct emerges due to a social desirability bias, implying that the GFP reflects nothing more than biased answering tendencies on personality questionnaires (e.g., Anusic, Schimmack, Pinkus, & Lockwood, 2009). Another explanation for the GFP comes from the evolutionary perspective in which socially and sexually selective pressures have shaped the GFP over evolutionary time into a suite of adaptive characteristics (Figueredo & Rushton, 2009; Rushton et al., 2008). These selective pressures might have actually brought the higher-order factor into being in a manner analogous to the evolutionary processes described by Fisher's classic model of Runaway Sexual Selection (Fisher, 1954; Nesse, 2007). As there is an ongoing debate about which of the above-described interpretations is the most plausible, there is a need for studies that gain insight into the nature of the GFP.

In the present study, we test a specific hypothesis that can be derived from the evolutionary account of the GFP, namely, that a high GFP score is related to high levels of support of parents towards their children (Figueredo et al., 2006). This expectation is derived from Life History Theory, a midlevel evolutionary account of systematic differences in evolved reproductive strategies (Wilson, 1975). Life History Theory states that in producing offspring, individuals can roughly adopt two major strategies. One is to produce many offspring with relatively little parental care. This has been labeled a *fast* life history strategy (Figueredo et al., 2006). Typical species using a fast life history strategy are several types of fish (such as the salmon) that drop millions of eggs into the water, hoping that some of them will hatch and survive. The other strategy is to produce fewer offspring but to provide a relatively large amount of parental care to better ensure their survival to reproductive age. This has been labeled a *slow* life history strategy. A typical slow-life history strategy animal (such as the elephant) has only few offspring but provides a very large amount of parental care to each one.

Although Life History Theory was originally constructed to explain differences between species, it has been shown that within species, individual differences exist in life history strategies. For example, considered on the continuum of mammalian species, humans are typically slow-life history strategists. Yet, it is evident that during human evolution and development, individual lineages have occupied niches that favor more offspring and lower parental care versus less offspring and more parental care (Figueredo et al., 2006; Figueredo, Gladden, Vásquez, Wolf, & Jones, 2009; Figueredo, Sefcek, & Olderbak, 2009; Rushton, 1985). In humans, fast or slow life history strategy is related to a broad pattern of individual differences such as speed of maturation, cohesiveness of social networks, degrees of religiosity, and also the distribution of personality traits (e.g., Figueredo et al., 2005). By definition, life history strategy should also be related to the level of parental investment, and there are now several larges studies that have indeed linked parental care with other life history variables. For example, in a large national survey containing thousands of participants, Figueredo et al. (2006) found that characteristics of a slow life history strategy were accompanied with higher levels of parental care and better family bonds (e.g., between parents and children and between spouses). Sefcek and Figueredo (2010) found similar results in a study with undergraduate students. Moreover, Del Giudice and Belsky (2011) reviewed the literature on attachment styles and argued that Life History Theory is a relevant theoretical framework in explaining attachment between parent and child. In sum, slow life history strategy is related to high levels of parental investment into offspring.

In humans, the type of life history strategy that is adopted is assumed to be closely linked to the GFP too (Rushton et al., 2008). For example, in their social survey study, Figueredo et al. (2006) examined a wide range of life history variables and found that the GFP falls into the same factor space as many other indicators of a slow life history strategy. In fact, some researchers have argued that the GFP is actually an indicator of life history strategy (e.g., Dunkel & Decker, 2010). Thus, as a slow life history strategy is linked to high GFP scores as well as to high levels of parental investment, it can be expected that high-GFP individuals provide more parental support. Such support can be in the form of resource allocation (e.g., food, money), somatic effort, or emotional support. In the current study, we examine emotional support. We focus on testing the specific and theory-driven expectation about the relationship between the GFP and parental support and do so by analyzing a large data set from the Netherlands that includes information about the parents' personality and the level of support that they provide towards their children (Harakeh, Scholte, de Vries, & Engels, 2005).

In earlier studies on Life History Theory, the relationship between parental support and the GFP has been examined before (e.g., Figueredo et al., 2006; Sefcek & Figueredo, 2010). However, the present study goes beyond this previous research because, to our knowledge, no other studies have directly examined the GFP–parental support association using multi-informant data (parents and child ratings). Yet, given the current debate about the nature of the GFP (see below), the use of such data may be particularly relevant for addressing the substantive versus artifact (e.g., social desirability bias) explanations of this construct.

1.1. Controversy surrounding the ontological status of the GFP

In discussing the research on the GFP, it is relevant to elaborate on the current controversy that surrounds the

ontological status of this construct. More specifically, the notion of a GFP has elicited a lively debate in which some researchers have suggested that the GFP may be a substantive factor with potentially important theoretical implications (Dunkel & Decker, 2010; Figueredo et al., 2006; Musek, 2007; Rushton et al. 2008; Van der Linden, Scholte, Cillessen, Te Nijenhuis, & Segers, 2010; Veselka, Schermer, Petrides, & Vernon, 2009), whereas others have suggested that this construct may be nothing more than a methodological artifact arising from the way personality is measured (Anusic et al., 2009; Ashton, Lee, Goldberg, & de Vries, 2009; De Vries, 2011). The evidence regarding these different views is mixed. For example, it has been proposed that general factors from different personality measures may be inconsistent (De Vries, 2011; Hopwood, Wright, & Donnellan, 2011), which would strongly compromise the interpretation of the GFP. Nevertheless, there are now several studies showing that GFPs extracted from various personality measures overlap substantially (mean r=.70), indicating that this construct is rather consistent and can be interpreted as a continuum of socially desirable behavior (Loehlin & Martin, 2011a; Rushton et al. 2009; Van der Linden, te Nijenhuis, Cremer, & van der Ven, 2011). It has also been proposed that the nature of the GFP depends on the factor extraction method or on the level of measurement such as personality facets versus factor scale scores (De Vries, 2011). However, GFPs extracted with different methods and from different levels of personality measures often correlate between r=.80 to 1, suggesting independence of method (e.g., Loehlin & Martin, 2011a, 2011b).

Another alternative explanation for the GFP is that it merely reflects social desirability tendencies (i.e., faking on tests) or common method bias (Anusic et al., 2009; Bäckström, Björklund, & Larsson, 2009). Support for this view often comes from complex structural equation models (Anusic et al., 2009; Riemann & Kandler, 2010) of which the implications are not always directly transparent. For example, Danay and Ziegler (2011) constructed a structural equation model in which most of the variance of the GFP was captured in a factor that they labeled impression management bias. However, this impression management factor showed strong overlap between self-reports and other ratings, which suggests that this factor is a substantive factor that conceptually resembles the GFP.

Bäckström, Björklund, and Larsson (2009) also assumed that the GFP mainly reflects social desirability bias. Consequently, they tried to make personality questionnaires without socially desirable items. Despite that taking out the socially desirable aspects of personality introduces several theoretical questions, it also became apparent that even in the newly designed personality questionnaire, the structural equation models that included the GFP still showed the best fits.

In contrast to the various artifact accounts of the GFP, there are a growing number of studies that contradict these accounts and instead support the substantive interpretation of the GFP. With respect to this, five major categories of findings can be identified. First, the GFP is associated with a range of non-self-report and real-life outcomes such as supervisor-rated job performance (Van der Linden, Te Nijenhuis et al., 2010) and objective sales results (Sitser TB, et al, Written communication, 2011), peer-ratings of social status among classmates (Van der Linden, Scholte et al., 2010), and even general intelligence (Loehlin, 2011; Schermer & Vernon, 2009). Second, the GFP shows substantial correlations with other valid and prominent psychological variables such as well-being, self-esteem, emotional intelligence, and affect (Erdle & Rushton, 2010, 2011; Veselka, Schermer, Petrides, Cherkas, Spector, et al., 2009). Third, the majority of studies that used multi-informant personality data have shown substantial overlap between self-report-based GFPs and other-ratings-based GFPs (e.g., Holden & Marjanovic, 2012; Veselka, Just, Jang, Johnson, & Vernon, 2012). Fourth, studies that have actually controlled for measures of social desirability response basis showed that such a bias did not affect the relationships between the GFP with other major variables (Erdle & Rushton, 2011; Schermer & Vernon, 2009). And finally, at least six published studies have now confirmed that the GFP has a genetic component (Figueredo & Rushton, 2009; Loehlin & Martin, 2011a, 2011b; Rushton et al., 2008; Veselka, Schermer, Petrides, & Vernon, 2009; Veselka, Schermer, Petrides, Cherkas, Spector, et al., 2009). All five categories of findings are very difficult to reconcile with the notion of the GFP as mere artifact and instead point into the direction of the substantive nature of this construct.

Eventually, the debate about the nature of the GFP is an empirical issue that might be settled over time. However, in order to do so, it is necessary that enough studies on the topic are available. As such, the present study can contribute to this debate because it examines the GFP from a specific theoretical point of view and tests whether the GFP is related to a real-life outcome, in this case parental support. The idea behind this approach is that if the GFP has behavioral implications, it is unlikely to be mere artifact and that conclusions about such findings are stronger when using multiple raters data.

More specifically, we hypothesized that (a) parents and their children should at least partially agree on the level of parental support provided and (b) this level of support is related to GFP of the parents. If such predictions are supported, then this would indicate that the GFP is a potential meaningful higher-order personality factor that is associated with expected real-life variables, in this case how much parents invest into their children.

2. Method

2.1. Participants

We used data from the 'Family and Health' project in which 428 Dutch families with a mother, a father, and two adolescent children were participating. The project data were obtained from the last three authors of the present article.

This project originally focused upon various family processes, for instance, substance-use-specific parenting, in relation to various health-related behaviors in adolescence (for details on the sample and procedures, see Harakeh et al., 2005; Van der Vorst, Engels, Meeus, Dekovic, & van Leeuwen, 2005). All families fulfilled the following inclusion criteria: Parents were married or living together, all children were biologically related to the parents, and none of the children were mentally or physically disabled. The mean age of the oldest child was 15.2 years (S.D.=.60). The mean age of the youngest child was 13.4 years (S.D.=.50). Boys and girls were represented equally: 47.2% were girls among the oldest children, and 52.3% were girls among the youngest children.

2.2. Procedure

Addresses of families eligible for participation were obtained from the records of 22 municipalities in the Netherlands. The families received a letter inviting them to participate. A total of 885 families volunteered, of whom 765 fulfilled the inclusion criteria. Due to project financial constraints, only 428 families were included, with selection based on educational level. Trained interviewers visited families in their home, asking all family members to complete the questionnaire individually, separately, and simultaneously. Each family received €30 if all members had completed the questionnaires. The study was approved by the independent medical ethics committee METiGG in Utrecht, the Netherlands (research 6209).

2.3. Measures

2.3.1. Big Five

Personality was measured with the Quick Big Five (QBF) inventory (Vermulst & Gerris, 2005), which consists of 30 adjectives related to the Big Five traits (six for each trait). The QBF has been developed as a short and therefore efficient measure of the Big Five. The validity and reliability of the inventory have been confirmed, and the inventory has also been used in several other studies (e.g., De Fruyt et al., 2006; Van der Linden, Scholte et al., 2010). Moreover, a large validation study showed that several of the Big Five factors show substantial intercorrelations (Vermulst & Gerris, 2005). In this sense, the QBF displays the same characteristics as any other Big Five measure (see, for example, Musek, 2007; Rushton & Irwing, 2011; Van der Linden, Te Nijenhuis et al., 2010) and likely will also contain a relatively strong general factor. Example adjectives used in the QBF are 'creative' (Openness), 'accurate' (Conscientiousness), 'withdrawn' (Extraversion), 'friendly' (Agreeableness), and 'nervous' (Emotional Stability). In the QBF, participants had to indicate on a 7-point scale (ranging from 1=*absolutely disagree* to 7=*absolutely agree*) whether the adjective applied to them. In the present study, the average reliabilities (alphas) of the five scales were *M*=83.6 (range .79–.89) for the mother and *M*=82.8 (range .78–.87) for the father.

2.3.2. Parental support

The level of parental support was measured with 12 items (Scholte, Van Lieshout, & van Aken, 2003) that ask about the level of emotional support that is given to the child (in the parent ratings) or is perceived by the child (in the child ratings). Example items for the parents are "I show that I admire my child," "I talk to my child about the things that matter to him/her," and "I support my child in what he/she does." The items for the children were the same, but formulated in the appropriate way. For example, "My father shows that he admires me," "I talk to my father about the things that matter to me," and "My father supports me in what I am doing." The reliabilities of the scales were α=.76 for the mother, α=.79 for the father, and α=.78 and α=.85 for the child ratings of support for the mother and father, respectively (no differences between oldest and youngest child).

2.4. Statistical analysis

As in previous studies (Van der Linden, Te Nijenhuis et al., 2010; Veselka, Schermer, Petrides, & Vernon, 2009; Veselka, Schermer, Petrides, Cherkas et al., 2009), we operationalized the GFP as the first unrotated factor of a factor analysis on the Big Five. We report the results based on the principal factoring (PF) method that is also commonly used in extracting the general factor *g* in the cognitive domain and has been used in several previous GFP studies (e.g., Van der Linden et al., 2011; Van der Linden, Te Nijenhuis et al., 2010). However, in order to test the stability of the GFP and its relative independence from the methods used, we also conducted GFP extraction with principal components analysis (PCA) and maximum likelihood (ML). In addition, we compared the GFP based on Big Five factor scores with a GFP directly extracted from the individual items of the QBF. Finally, we also constructed a GFP based on factor loadings as described in a large meta-analysis on Big Five measures (Van der Linden, Te Nijenhuis et al., 2010). These meta-analytic GFP loadings were .42, .62, .57, .57, and .63 for Openness (O), Conscientiousness (C), Extraversion (E), Agreeableness (A), and Emotional Stability (ES), respectively. The meta-analytic-based GFP was calculated by summating the products of the Big Five scores of the present study and its designated meta-analytic GFP factor loading (e.g., [(.42 ∗ Openness score)+(.62 ∗ Conscientiousness score)+etc.). It can be expected that meta-analytic loadings provide a more stable picture of the GFP compared to sample loadings, which tend to show considerable sample fluctuation (Van der Linden, 2011).

We examined the associations between parents' ratings of parental support and their self-reported personality (GFP), but also took into account multi-informant relationships. For example, we examined the associations between self-rated personality of the parents and parental support ratings by the children. We analyzed the child-rated parental support of the oldest and youngest child separately.

3. Results

3.1. GFP extraction

Extracting the first unrotated factor (using PF) showed that, in this sample, the GFP explained 33% of the total variance in the Big Five dimensions. All five dimensions loaded positively on the GFP with loadings of .45, .21, .45, .73, and .15 for O, C, E, A, and ES, respectively. Extraction with the ML or PCA method was nearly identical to the PF method as the correlations were r=.99 for the ML as well as for the PCA-based GFP and for the mothers as well as the fathers. In addition, the GFPs based on Big Five scale scores were nearly identical to the GFPs directly extracted from the items. The correlations were .98 and .95 for the GFPs of the mothers and fathers, respectively. In the present sample, the loadings of some of the Big Five factors on the GFP were moderate to low, which somewhat deviates from several previous studies on the topic (e.g., Van der Linden, Te Nijenhuis et al., 2010). However, the sample-based and meta-analytic-based GFPs were also almost identical, showing correlations of r=.93 for the GFPs of the mothers and r=.92 for the GFPs of fathers. It is important to note that the meta-analytic GFPs were calculated with factor weights that construct a well-balanced mix of all the Big Five factors. Thus, the meta-analytic-based GFPs reflect variables in which all Big Five factors contribute substantially. The correlation of the GFPs of the mothers and fathers was positive, yet relatively low (r=.13, p<.05). A full correlation table of all study variables is available upon request to the first author.

3.2. Parent–child emotional support measures

The children rated the support that they receive from their mother significantly higher than the support from their father (oldest child: M_{mother}=4.12, [S.D.=.40], M_{father}=3.93 [S.D.=.53], t=9.43, df=425, p<.01, Cohen's d=.41; youngest child: M_{mother}=4.12, [S.D.=.37], M_{father}=3.95 [S.D.=.48], t=8.27.43, df=425, p<.01, d=.39). The direction of these results was in agreement with the parent-rated support. More specifically, mothers rated themselves as more supportive towards their children than fathers rated themselves supportive (M_{mother}=4.12, [S.D.=.41], M_{father}=3.92, [S.D.=.51], t=9.67, df=426, p<.01, Cohen's d=.62). The correlations between the level of support as rated by the parent and as rated by the corresponding children were for the mothers r=.35 (p<.01) and r=.27 (p<.01) for the oldest

Table 1
Correlations between the different personality measures (GFPs, Big Five) and self- and child ratings of support

	Mother=> oldest	Mother => youngest	Oldest=> mother	Youngest => mother	Father=> oldest	Father => youngest	Oldest => father	Youngest => father
Personality mother								
Sample-based GFP	**.38****	**.38****	**.14****	**.11***	.08	.10	.08	.05
Meta-based GFP	.35**	.37**	.13**	.11*	.09	.10	.09	.07
Openness	.22**	.16**	.06	.02	.04	.04	.01	–.04
Conscientiousness	.11*	.13**	–.02	.01	.06	.02	.03	–.01
Extraversion	.21**	.24**	.12*	.12*	.04	.06	.10	.06
Agreeableness	.34**	.35**	.11*	.05	.07	.10	.05	.04
Emotional Stability	.18**	.18*	.12*	.09	.04	.08	.08	.12*
Personality Father								
Sample-based GFP	.04	.11*	.06	.12*	**.35****	**.32****	**.16****	**.13****
Meta-based GFP	.01	.07	.08	.12*	.35**	.31**	.15**	.13**
Openness	.06	.08	.04	.12*	.16**	.16**	.11*	.11*
Conscientiousness	.00	.04	.04	.03	.16**	.14**	.03	.07
Extraversion	–.05	.05	.05	.09	.20**	.20**	.08	.10
Agreeableness	.02	.08	.04	.05	.37**	.33**	.12*	.11*
Emotional Stability	.03	.02	.06	.04	.15**	.09	.10	.01

Areas in gray describe the relevant correlations between the GFP of a specific parent (mother or father) and the designated support ratings.
The entries in boldface represent the most relevant correlations in this study.
Labels in the top row indicate the type of rating involved. For example, "Mother≥oldest" means Mother's self-report on parental support towards the oldest child, "Youngest≥father" refers to the parental support received by the father as rated by the youngest child, etc.
*p<.05; **p<.01.

and youngest child, respectively, and for the fathers r=.33 (p=.01) and r=.24 (p<.01) for oldest and youngest child, respectively. These positive correlations show that there is agreement between parents and children on the level of parental support, even though this agreement is moderate.

3.3. Parent–child relationships and GFP

Table 1 provides an overview of the correlations between parents' personality and parental support. From Table 1, several clear patterns can be identified. First, the results show that, as expected, the parents' GFP scores were related to the level of parental support. Regarding the parents' self-report measures, the GFP–parental support correlations were substantial for the mother as well as for the father and for the oldest and youngest child. For the mother, the GFP displayed the strongest correlations with their self-ratings of child support. For the father, the correlation with self-rated support was slightly higher for Agreeableness than for the GFP, yet the latter construct was still among the highest of the relationships.

Importantly, the GFPs of the parents were not only related to self-reported parental support but also to the level of parental support as rated by the children. Table 1 shows that the correlations were moderate to low (range r=.11–.16), but nevertheless, they were again often the highest, or among the highest of all personality variables. The correlations between the parents GFPs and child-rated parental support were less than half the magnitude than the correlations between the GFPs and parent-rated parental support (e.g., r=.38 and r=.14 for the mother and oldest child). This finding shows that, even though parents and children partly agree on the level of support, regarding the GFP relationships, there is also an amount of discrepancy between the multi-informant and monoinformant method.

Table 1 also shows a pattern in which the majority of significant correlations between parent's GFPs and child-rated parental support was mainly restricted to the corresponding parent. For example, the mothers' GFPs were associated with mother support ratings but not with father support ratings. This observation is relevant because it suggests that the results were not due to a general positive or negative answering tendency of the children. The relationship between the GFP and parental support was also found using confirmatory factor analysis. For reasons of brevity these analysis are not reported here, but are described in the online supplementary material accompanying this article.

3.3.1. The general nature of the GFP

In the present sample, the loading of Agreeableness on the GFP was somewhat stronger compared to the other Big Five factors. Opponents of the GFP might therefore question whether the general factor we extracted is not mainly a latent factor of the trait with the highest loading, in this case Agreeableness. Such arguments regarding the GFP have been raised before (De Vries, 2011). Although several arguments against such an interpretation of the GFP have already been provided in the literature (Van der Linden, 2011), we decided to directly test the robustness of our findings by examining whether the relationship between the GFP and parental support remains constant when using a general factor that does *not* include Agreeableness. That is, we extracted a general factor from the traits Openness, Conscientiousness, Extraversion, and Emotional Stability, but *not* Agreeableness. We henceforward refer to this alternative GFP as $GFP_{minus}A$.

The $GFP_{minus}A$ showed a correlation of r=.75 (p<.01) with the GFP based on all Big Five traits. Moreover, the $GFP_{minus}A$ was still significantly related to parental support in the self-report data of the parents as well as across ratings (i.e., parents, children). Specifically, for the mother's self-ratings, the $GFP_{minus}A$ showed correlations of r=.23 (p<.01) and r=.26 (p<.01) for parental support towards the oldest and youngest child, respectively. The mother's $GFP_{minus}A$ was r=.12 (p<05) and r=.13 (p<.05) correlated with the ratings of parental support of the oldest and youngest child, respectively. These values are very close to the ones found with the GFP based on the complete Big Five (Table 1). The correlations for the fathers' $GFP_{minus}A$ and the different ratings of parental support showed a similar pattern. Specifically, the father's $GFP_{minus}A$ was significantly correlated with father's self-report of support towards the oldest and youngest child (in both cases, the r was .22 [p<.01]) and to the parental support as rated by the oldest and youngest child, r=.10 (p<.05) and r=.11 (p<.05), respectively. These findings confirm the general nature of the GFP and strengthen our conclusions.

3.4. GFP underlying Big Five in parental support?

As the GFP is a linear combination of lower-order personality factors—in this case the Big Five—it is evident that not only the GFPs but also several individual Big Five dimensions showed significant relationships with parental support (Table 1). However, the theoretical assumption in

Table 2A
Correlations between Big Five scores Mother and parental support, after controlling for mothers' GFP

Personality	Mother≥oldest	Mother ≥youngest	Oldest≥mother	Youngest≥mother
Openness	−.04	−.11*	−.04	−.05
Conscientiousness	.02	.04	−.05	−.03
Extraversion	−.08	−.04	.03	.08
Agreeableness	.10	.12*	.01	−.04
Emotional Stability	.05	.05	.07	.06

Table 2B
Correlations between Big Five scores father and parental support, after controlling for fathers' GFP

Personality	Father≥oldest	Father≥youngest	Oldest≥father	Youngest≥father
Openness	−.11*	−.08	.01	.02
Conscientiousness	.12*	.11*	.01	.05
Extraversion	−.08	−.07	−.05	.01
Agreeableness	.19**	.20**	.01	.01
Emotional Stability	.09	.03	.07	−.02

Labels in the top row indicate the type of rating involved (e.g., "Mother≥oldest" means Mother's self-report on parental support towards the oldest child, "Youngest≥father" refers to the parental support received by the father as rated by the youngest child, etc.).

* $p<.05$.

** $p<.01$.

GFP research is the Big Five consist of a combination of *shared* variance and *specific* variance and that therefore the general factor partly influences the scores on lower-order factors. In this context, it is useful to examine to which extent the relationship of the Big Five and parental support changes after controlling for their shared variance, the GFP. We did so by calculating the partial correlations between the Big Five and parental support after controlling for the mother's or father's GFP, thus statistically isolating the contributions of *specific* variance components uniquely attributable to the lower-order personality factors. The results are displayed in Table 2A and 2B and show that after controlling for the GFP (the *shared* or *common* factor variance), in the majority of cases, the partial correlations (the *specific* factor variances) between each of the Big Five and parental support were strongly diminished. The only exception was the relationship between fathers' Agreeableness and fathers' report of parental care that remained moderate and significant.

4. Discussion

The main finding in the present study was that if the parents scored high on the GFP, they provided more emotional support towards their children. This was found in the self-reports of the parents as well as in the support ratings of the children. As such, this study may contribute to insight into the ontological status of the GFP. More specifically, we favor the interpretation of our findings as a test of a specific prediction from Life History Theory, which states that (a) there is a substantive GFP and (b) this construct relates to parental investment. Figueredo, Gladden et al. (2009) argued that not having a larger theoretical framework guiding predictions about relationships leaves "…personality researchers to follow intuition or trial and error to direct discovery of new psychological phenomena" (p. 256). Apparently, Life History Theory is able to provide such biologically based predictions, of which one of them was tested and largely confirmed in the present study.

It is important to note that our findings are in line with several previous studies showing that individuals with a slow life history strategy on average score higher on the GFP as well as invest more heavily in their offspring (see, for example, Figueredo et al., 2006 or Del Giudice & Belsky, 2011). Adopting a slow life history strategy implies that parents closely cooperate in the upbringing of their children (Del Giudice & Belsky, 2011; Geary, 2005; Hrdy, 2009). In addition, a slow life history strategy has also been associated with 'extended parenthood,' which means that other family or society members are more often involved in child rearing. Such a parenting style requires a personality profile that entails social sensitivity and enhances cooperation (Geary, 2005; Hrdy, 2009). The GFP is assumed to be exactly that, namely, a personality factor that involves a heightened knowledge and sensitivity to social norms and the ability to use these knowledge and sensitivity in order to optimize interpersonal behavior (Geary, 2005; Hrdy, 2009; Van der Linden, Scholte, et al., 2010).

To our knowledge, all previous life history studies that have included the GFP showed positive relationships between the latter construct and a slow life history strategy (e.g., Dunkel & Decker, 2010; Dunkel, Kim, & Papini, 2011; Figueredo et al., 2006; Figueredo, Gladden, et al., 2009; Figueredo, Sefcek, et al., 2009). Nevertheless, there are some studies showing that certain facets of the Big Five traits are related to *fast* life history strategy indicators. For example, it has been found that impulsivity and sensation seeking, which are often considered aspects of Extraversion, are positively related to promiscuity, which is a fast-life history strategy indicator (Figueredo et al., 2005). In our view, GFP theory does not exclude such findings. Specifically, the GFP is assumed to reflect a continuum of (substantive) socially desirable behavior. This implies that not all Big five facets should behave in the same way regarding life history indicators. For example, Extraversion does not only include impulsivity, which is not a socially desirable trait, but also includes the ability to make friends, to experience positive mood states, and to be proactive, which *are* socially desirable traits. It can be expected that mainly the variance capturing the socially desirable aspects of Extraversion would load positive on the GFP and relate to a slow life history strategy, whereas the unique and socially undesirable variance of Extraversion may not show such relationships. As the personality inventory in the present study (i.e., the QBF) was constructed to be an efficient Big Five measure, it does not allow further analysis of specific facets. However, it may be interesting for future research to

test these ideas about the differential role of personality facets in relationship to life history strategy.

With regard to the relationship between Life History Strategies and the GFP, an assumption is that the GFP may have evolved due to unidirectional selection of personality traits that favor social and cooperative behavior (Geary, 2005; Hrdy, 2009). In stable and predictable environments, such behavior may have been an advantage in raising children. Consequently, individuals with such a mix of socially desirable traits might have had more or longer-living offspring. In addition, in the past, groups of people with a relatively high GFP may have had an advantage because, due to their social and cooperative behavior, they may have had higher chances of survival during adverse circumstance or during warfare. The idea that the GFP has been under evolutionary selection, as predicted by Life History Theory, is supported by findings that this construct has a substantial heritability. For example, Figueredo and Rushton (2009) found that the GFP has a relevant proportion of nonadditive genetic variance. This type of genetic variance indicates that a trait is adaptive and has been has been subjected to recent evolutionary selection.

We have to note that in the current literature, the main alternative explanation that is given for the GFP is that it is not a substantive or evolutionary factor but instead merely reflects socially desirability bias (e.g., Anusic et al. 2009; De Vries, 2011). The results of the present study can contribute to this 'substantive-versus-artifact' debate because it tested monoinformant as well as multi-information data. Moreover, to the best of our knowledge, it is the first study that contained self-report personality data from the parents as well as parent ratings and child ratings of parental support in testing predictions about GFP, Life History Theory, and parenting.

In our view, the multi-informant data in the present study support the substantive interpretation of the GFP over the artifact interpretation. More specifically, if the GFP would have been exclusively based on socially desirable answering tendencies of the parents (i.e., faking), then we would not expect their GFPs to relate to *child-rated* parental support. Yet, such a relationship was present in the data, which seems to indicate that the GFP at least has a substantive component. In contrast to the idea that the GFP reflects social desirability as a bias is the perspective form Life History Theory which states that "…an evaluative bias is not a methodological artifact, but a selective pressure. Individuals with a socially desirable response bias, indicating evolved preferences for socially desirable behaviors in themselves and others, will therefore actually be more likely to carry genes for exhibiting those socially desirable behaviors" (Figueredo & Rushton, 2009, p. 560)

Regarding other potential biases in child ratings, we consider it unlikely that their ratings of parental support are solely based on general answering tendencies, such as being overly positive or negative about their family. More specifically, we found that the child ratings of support from a specific parent were mainly related to that corresponding parent only. This finding indicates that these ratings of the children were indeed influenced by the personality of the corresponding parent.

4.1. Study limitations

In interpreting the present results, several limitations need to be taken into account. First, the selection of the families may have led to some restriction of range regarding Life History characteristics. For example, in all families, the parents were still living together and with their biological children, which are actually indicators of a relatively slow life history strategy (Figueredo et al., 2006). Thus, it can be expected that individuals who adopt a faster life history strategy are underrepresented in the sample, which may have reduced the effect sizes. Yet, even with a potential restriction of range, we still found significant effect sizes in this study. It can be expected that effect sizes may be even larger in more diverse samples with participants that display a broader range of life history strategies.

Another limitation is that we only focused on a limited number of variables (i.e., personality, parental support), as the data set did not include a full range of life history measures. On the other hand, the purpose of the this study was not to examine Life History Theory as a whole but instead to test one specific and important relationship that is predicted from the theory, namely, the link between parental personality and support.

Finally, in the present study, the GFP factor loadings of two of the Big Five dimensions were modest, which implies that in this sample these dimensions had a relatively modest contribution to the nature of the GFP. However, we also found that the sample-based GFP scores were almost identical (r=.92 and r=.93 for mother and father, respectively) to the GFP scores based on meta-analytic factor loadings (Van der Linden, Te Nijenhuis et al., 2010) in which all Big Five dimensions substantially contribute to the general factor.

4.2. Conclusion

There are various theories about parental support and attachment styles (see, for example, Del Giudice, 2009), and the personality literature also provides different explanations of the GFP (Anusic et al., 2009; Rushton et al., 2008). The advantage of using Life History Theory as a theoretical framework is that it allows researchers to combine these two research areas and to meaningfully interpret the results. As such, the present findings support the notion of the GFP as a substantive construct that is related to the amount of support that parents provide towards their offspring. Our findings do not stand isolated but fit with a substantial amount of previous research on Life History Theory, the GFP, and parental attachment.

The assumption that life history strategy serves as the underlying biological mechanism governing the evolved

adaptive structure of parent–child relationships does not exclude the possibility of environmental or other influences. Nevertheless, Life History Theory can explain why parental support would be accompanied with a range of personality characteristics as reflected in the GFP.

Supplementary Materials

Supplementary data to this article can be found online at doi:10.1016/j.evolhumbehav.2012.01.007.

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