

The Applied Relevance of the General Factor of Personality: Advancements in the Occupational and Clinical Context

Dimitri van der LINDEN

Department of Psychology, Education, and Child Studies,
Erasmus University Rotterdam, The Netherlands

Curtis S. DUNKEL

Department of Psychology, Western
Illinois University, USA

Peiqian WU

Department of Psychology, Education, and Child Studies,
Erasmus University Rotterdam, The Netherlands

It has been proposed that the hierarchical structure of personality contains a general factor, representing the shared variance of lower-order personality traits, such as the Big Five. This general factor of personality (GFP) reflects a mix of socially desirable traits. There is a scientific debate on whether the GFP merely arises due to measurement artifact (e.g., social desirability bias), or whether it is largely substantive. In the substantive view of the GFP, the factor is proposed to be mainly social effectiveness or resilience. In the present article we focus on advancements on GFP research in two applied areas, namely occupational behavior and clinical psychology. We discuss research showing that, in the work domain, the GFP positively relates to supervisor-rated and objective job performance, and leadership. In line with the social-effectiveness account, the GFP also is associated with more interest in social jobs. In the clinical domains, low GFP scores have shown to be related to a wide range of psychopathologies and difficulties in dealing with everyday life. In conclusion, we argue that the GFP may have significant theoretical and practical implications.

Key words: General factor of personality, job performance, psychopathology, vocational interest, social effectiveness

In the early stage of research on individual differences, progress was hampered by an inability to define the basic structure of personality (Baumert, Schmitt, & Perugini, 2019). Since then, however, models have been developed that describe a lim-

ited number of core personality factors. The most established model, currently, is the Five Factor Model (Costa & McCrae, 1992)—or closely related Big Five—(Goldberg, 1992), but there are also others, such as Eysenck's (1975) Giant three model (consisting of psychoticism, extraversion, and neuroticism [PEN]). A more recent model is the 6-factor HEXACO model, which is based on adjusted versions of the Big Five, plus the addition of an Honesty–Humility factor (Aston, Lee, & Goldberg, 2004).

Correspondence concerning this article should be addressed to Dimitri van der Linden, Department of Psychology, Education, and Child Studies, Erasmus University Rotterdam Burgemeester Oudlaan 50, 3000 DR Rotterdam, The Netherlands.
E-mail: vanderlinden@essb.eur.nl

These models have led to significant advancement in the field by allowing scholars to systematically study the relationship between personality and various real-life outcomes. For example, applied psychology has consistently shown that conscientiousness is the best personality predictor of general job performance (Barrick, Mount, & Judge, 2001). Extraversion is predictive for a range of social indicators such as social status (Anderson, John, Keltner, & Kring, 2001), whereas neuroticism is a good predictor of psychological problems, such as job burnout (Swider & Zimmermann, 2010). Also, the honesty-humility factor in the HEXACO model turned out to be a relatively good predictor of counterproductive work behavior (Lee, Berry, & Gonzalez-Mulé, 2019).

Although the mainstream personality models provided opportunities to systematically study personality and predict outcomes, the question remains to what extent their dimensions are truly basic. To illustrate, it is consistently found that personality dimensions intercorrelate in predictable ways, leading to a so-called general factor of personality, or in short, the GFP (Block, 2010; Figueredo, Vasquez, Brumbach, & Schneider, 2004; Loehlin, 2011; Musek, 2007; Rushton, Bons, & Hur, 2008; van der Linden, te Nijenhuis, & Bakker, 2010). This general factor seems to reflect a mix of socially desirable traits. In terms of the Big Five, a high GFP score represents relatively high openness to new experiences, conscientiousness, extraversion, and friendliness, and lower scores on neuroticism. It is relevant to emphasize, though, that the GFP is not confined to the Big Five, but in fact, can be extracted from every comprehensive personality measure or model (Rushton & Irwing, 2011; van der Linden et al.,

2011). Moreover, the general factors extracted from different personality measures (e.g., Big Five, Eysenck's PEN, HEXACO, California Personality Inventory) show substantial overlap, which confirms that they largely reflect the same latent construct (Rushton & Irwing, 2011).

The idea that a GFP exist is not new. For more than a century, the existence of a strong common factor has been mentioned in various studies (e.g., Webb, 1915; Edwards, 1957; McCrae & Costa, 1983). Yet, it was often assumed that it merely was social desirability bias or a statistical artifact and thus should be considered a nuisance in measuring personality, rather than reflecting a basic trait (Ashton, Lee, Goldberg, & Vries, 2009; Bäckström, Björklund, & Larsson, 2009; Anusic, Schimmack, Pinkus, & Lockwood, 2009). Given this view, however, it is remarkable that it has not become common practice to control for the general factor in personality studies.

One of the reasons that scholars did not widely adopt the practice of controlling for the general factor is that the picture may not be that simple, and that the GFP contains a relevant substantive component that plays a role in the predictive validity of personality. In accordance with this latter view, more recent research has revealed that the GFP meaningfully relates to a wide range of real-life outcomes, which is not what one would expect from measurement error. Subsequently, it was proposed that the GFP is largely substantive and represents general social effectiveness (Rushton & Irwing, 2011; Dunkel & van der Linden, 2014; Loehlin, 2011) or resilience (Dunkel, van der Linden, Kawamoto, & Oshio, 2021) that allows a person to flexibly adapt behavior depending on the social context.

Since its inception, the idea of a substantive

GFP that captures social effectiveness or flexibility has led to a scientific debate in which some studies support the substantive account of the GFP (Pelt, van der Linden, Dunkel, & Born, 2017; van der Linden, Dunkel, & Petrides, 2016), whereas others seem more in line with the bias/artifact account (Bäckström et al., 2009; Chang, Connelly, & Geeza, 2012; Riemann & Kandler, 2010). The different lines of arguments and empirical evidence in this discussion have now been documented extensively in previous articles (For example, Revelle & Wilt, 2013; van der Linden et al., 2016). Therefore, in the present paper we do not intent to discuss these points again but rather aim to focus on the value of the GFP in two applied areas in which much recent work has been undertaken, namely the occupational and clinical domain. We will discuss the presumed nature of a substantive GFP, and present research and arguments that support the notion that including a general factor contributes to predicting and explaining behavior in these two applied domains.

The GFP and Occupational Behavior

Job Performance

Although research on the GFP is relatively recent, a more extensively studied topic that seems closely related to it is social desirability in personality measures (Ones, Viswesvaran, & Reiss, 1996; Edwards, 1957; Nicolson & Hogan, 1990). The reason that scholars were very interested in social desirability was that it was assumed to interfere with the predictive validity of personality measures in personnel selection and job performance (Paulhus, 2017). Accordingly, researchers tried to develop methods of dealing with this phenomenon, such as controlling for social desirability measures, or statistically taking

out the common factor (Nederhof, 1985; Larson, 2019).

Despite such efforts, however, evidence accumulated that the socially desirable component in personality may not be only bias, but also reflects genuine socially desirable or effective behavior. For example, in a quasi-experimental study, people scoring high on social desirability tended to cheat less in a lottery game (Zettler, Hilbig, Moshagen, & de Vries, 2015). Connelly and Chang (2016) looked at the social desirability using a meta-analytic multitrait-multirater study, and concluded that “...SD [Social desirability] scales are strongly affected by substantive traits, particularly Conscientiousness, Emotional Stability, and Agreeableness. SD scales are more strongly influenced by these traits than by self-report response styles” (p. 11).

This conclusion fits with Ones et al. (1996) who suggested that the discussion of social desirability bias is a red herring distracting from the fact that the predictive validity of the Big Five strongly depends on this socially desirability component, which is very closely related to the GFP.

Because the GFP overlaps with social desirability it seems valid to expect that, therefore, the GFP also plays a relevant role in the predictive value of personality in an occupational context. Pelt et al. (2017) tested this idea by re-analyzing meta-analytic data on the relationship between the Big Five and job performance. They combined meta-analytic Big Five intercorrelations, with meta-analytic data on the associations between the Big Five and job performance as described in Barrick et al. (2001), Berry, Ones, & Sackett (2007), Chiaburu, Oh, Berry, Li, & Gardner (2011), and Judge, Bono, Ilies, & Gerhardt (2002). A summary of their findings is provided in Table

Table 1. Summary of meta-analytic based associations between the GFP and job performance indicators (Extracted from the study of Pelt et al., 2017).

Indicator	Corrected	Uncorrected
Performance criteria		
Supervisor-rated performance	.33	.19
Objective Performance	.28	.14
Team Performance	.44	.28
Training Performance	.47	.23
Contextual Performance		
OCB	.30	.23
CWB	-.47	-.46
Leadership		
Leadership emergence	.49	^a
Leadership effectiveness	.40	^a
Specific Jobs		
Sales	.20	.12
Management	.31	.17
Police	.29	.17
Professional	.13	.07
Skilled/semi-skilled	.25	.15

Notes. OCB=Organizational Citizenship Behavior; CWB=Counterproductive Work Behavior; ^a No uncorrected values were provided in the study of Judge et al. (2002). Corrected=Corrected for unreliability.

1 and shows, among others, that the GFP is substantially related to supervisor-rated and objective job performance. This is not in line with the interpretation of the GFP as mere questionnaire bias, but rather suggests that the GFP reflects a broad behavioral pattern with real-life outcomes.

A relevant question in this area is how the general factor relates to the effects of the more specific dimensions, such as the Big Five. Pelt et al. (2017) directly addressed this point by comparing the contribution of the GFP to the unique variance of the Big Five dimensions. The unique variance was obtained by taking out the GFP from each of the Big Five. Pelt et al. found that the GFP was responsible for the lion-share of the criterion-related validity of the Big Five. That is, the correlations between the Big Five and job perfor-

mance were often strongly attenuated when the GFP variance was taken out. For example, the direct correlations between extraversion on the one hand, and leadership emergence and leadership effectiveness, on the other hand, were .33 and .24, respectively. After removing the GFP variance, the correlations of extraversion with leadership emergence and effectiveness became .11 and .05, respectively, which are reductions of 66% and 80%! Similar patterns were found across all the Big Five dimensions and the job indicators, although the percentages differed depending on the specific trait.

In terms of the relative contribution of lower versus higher-order factors, reviewers sometimes ask for 'reversed analyses' in which it is tested how the GFP contributes *beyond* the Big Five. In our view, though, such a test would not be very meaningful; the notion of higher-order factors implies that they are partly present in the underlying factors. Therefore, conducting a regression analysis in which first the Big Five are entered and then the GFP is tested beyond that, may not be very meaningful. After all, in such analysis one would have already captured most of the GFP variance in the first step; it is all about the baby and the bathwater!

Regarding the relationship between the GFP and occupational behavior/job performance, one aspect to take into account is the possible influence of culture. For example, there may be significant differences between Western and Eastern countries in what is considered social desirable or effective behavior (e.g., Johnson & van de Vijver, 2003). As an illustration, several studies found that American workers tend to predominantly value individualism, independence and self-efficiency, whereas Japanese workers tend

to gravitate towards group involvement and loyalty to the employer (Engle, 1988; Markus & Kitayama, 1991). A relevant question, therefore, is how the GFP relates to such differences. Although we are not aware of previous studies that directly compared the GFP and work behaviors in different cultures, there are some studies that allow us to address this question in an indirect manner. Specifically, there is evidence suggesting that being high on the GFP also implies that one is sensitive to what is considered socially desirable behavior in a given context or culture. For example, by comparing the US and Japan, Dunkel (2013) found that high-GFP people showed more enculturation. In other words, high-GFP persons are more likely to behave in a way that is in accordance with the ruling values in a specific country. Based on such findings, it can be expected that, although in different countries, the GFP may be associated with different types of behavior, many relationships with criteria such as job performance would be similar.

The Social Aspects of Work

What also becomes apparent from Table 1 is that the GFP is particularly associated with socially-laden work. For example, a high GFP seems favorable for team performance, and is associated with having a leadership position and leadership effectiveness (Pelt et al., 2017). Such patterns nicely fits with the notion of the GFP as social effectiveness or resilience (Dunkel et al., 2021). Social effectiveness, in this context, means that one can behave in such a way that it becomes more likely to obtain one's personal goals. In light of leadership, if two employees compete for the same managing position, then, given all else being equal, the one who knows best how to convince, or 'win-over', relevant others (e.g., colleagues,

supervisors, customers) is more likely to get the promotion (Coté, Lopes, Salovey, & Miners, 2010).

Obviously, findings such as those reported Pelt et al. (2017) can only reveal associations between the GFP and leadership, but cannot directly establish causal effects. However, given that personality is considered to be relatively stable, it is likely to play a causal role in obtaining a leadership position. To our knowledge, the first study to empirically confirm this was Wu, van der Linden, Dunkel, van Vugt, & Han (2020). They studied 32 small groups of (four) students who had to negotiate on who would be the group leader. Before the subgroups started to negotiate, they had to fill out a range of questionnaires, among which was a personality measure. It was found that the students' GFP scores were predictive of who would be elected group leader. In a second round of elections, the GFP scores were also related to the number of votes the group leaders obtained in the competition of becoming the general leader.

More generally, given the interpretation of the GFP as a social skills or flexibility factor (Dunkel et al., 2021), it makes sense that it is related to many different work-related outcomes. After all, people are social by nature. Some work-related aspects have a strong social component, for instance, when one has to deal with customers and being socially effective in this context would clearly contribute to performance (Boyatis, Good, & Massa, 2012; Blickle, Wendel, & Ferris, 2010). But even when a job is not obviously social (e.g., computer programmer, construction worker) successes or failures may still partially depend on how we relate to other people (O'Boyle, Humphrey, Pollack, Hawver, & Story, 2011).

The idea that the GFP influences work-related

outcomes, mainly through social effectiveness and resilience is supported by the studies showing strong overlap between the general factor with other well-known social constructs such as emotional intelligence (van der Linden et al., 2017) and ego-resilience (Dunkel et al., 2021), the latter referring to the ability to adjust one's behavior depending on the context.

In light of the discussion above, one may ask whether there are occupations in which the GFP would be negatively related. We are not aware, however, of studies that have found negative associations between the GFP and performance in any specific occupation. One possible reason for this is, as stated above, that everything else being equal, on average, it is always an advantage to be socially effective. That being said, there are of course specific cases of people being highly successful who also seemed rather socially ineffective. One may think of some famous scientists or businesspersons (for example, Karl Marx as well as Steven Jobs had conflicts with many people, and Paul Dirac was 'extensively shy'). Nevertheless, it is likely that these are salient exceptions—or outliers—rather than indicating that in some jobs being socially effective would be a general disadvantage.

Vocational Interests

The GFP not only relates to how one *performs* at work, but also to work-related interests and motivations. The general literature on vocational interest shows that people tend to be more motivated to engage in activities that match with their skills and traits (Su, 2012). A person who is very orderly and has a keen eye for details is, on average, more likely to be interested in a job in which these characteristics can be applied (e.g., book keeper, data scientist, or librarian). A person who

has excellent social skills may prefer a job in which interacting with other people is important (e.g., sales, management). In a similar line of reasoning, it can be expected that high-GFP people also have a higher interest in more social occupations. This latter hypothesis was recently tested by van der Linden, Dunkel, & Wu, (2021) who used Holland, Powell, & Fritzsche, (1994) RIASEC model of interests, consisting of Realistic (e.g., practical work), Investigative (e.g., science), Artistic, Social, Enterprising (business), and Conventional (orderly, detail-oriented) interests. In two occupational samples of 752 and 18,000 participants, respectively, it was found that the GFP showed the strongest associations with the social and enterprising interests. In Holland's model, the social and enterprising dimensions are the ones who also have the strongest social component, i.e., entail jobs in which one has to interact with others (Holland et al., 1994).

van der Linden et al., s (2021) conceptually replicated their findings using the large Project Talent sample (Flanagan, 1962) that contains the data of 81,130 students in their last year of high-school. This was approximately 5% of the total population of these students in the US at the time of measurement. Higher scores on the students' GFP were associated with more interest in job categories with relatively strong social components. Many jobs can be classified under the broad interest categories of working with people versus working with things (Tracey & Rounds, 1996). In the study with the high-school students, it was found that GFP scores were substantially and positively correlated with interest in working with people, whereas the GFP was very weakly related to interest in working with things. Finally, using the data from the National Merit Twin Study (Loehlin &

Nicols, 1976), van der Linden et al. (2021) showed that GFP scores and social interests had a genetic correlation of $r = .31$, indicating that the two are influenced by an overlapping set of genes.

As the GFP relates to vocational interests it seems logical to expect that the employee's average scores on the GFP will differ in different occupations depending on how 'social' a job is. This, of course, has been partly confirmed by studies that found that employees with managerial positions, on average, score higher on the GFP compared to (matched) employees without such positions (Pelt et al., 2017).

To the best of our knowledge, there are no published articles on the GFP distributions in different jobs yet. Nevertheless, we recently conducted a study among a representative sample of the working population in the Netherlands that confirmed that compared to jobs that mainly involved working with things (e.g., construction, transport), people in typical social jobs (e.g. teachers, therapists) scored higher on the GFP. Note that this effect was independent of the employee's gender and age. Thus, it indeed seems to be true that high-GFP people self-select, or are more often selected, for jobs in which they can apply, and benefit from, their social effectiveness.

The GFP in the Clinical Domain

Another applied area in which the GFP is relevant and progress has been made is clinical psychology. Specifically, if being socially effective contributes to success in a wide range of life areas, then being low on social effectiveness may be indicative for psychological problems (Musek, 2007; Rushton & Irwing, 2011). Early research already showed that very low scores on the GFP are indeed associated with various psychopatholo-

gies such as depression, anxiety, or conduct-disorders (Rushton & Irwing, 2011). The overlap between the GFP and psychopathology does not only depend on self-reports. For example, children's GFP scores, based on self-reports were found to be positively associated with their anxiety level as reported by parents and teachers (van der Linden et al., 2013).

One way in which the GFP and clinical literature converge is through the work on the general factor of psychopathology, often referred to as the *p* factor (Caspi et al., 2014; Lahey et al., 2012). The idea of the *p* factor was based on the finding that, although there are distinct categories of psychopathology, in practice there is a large comorbidity. Accordingly, a wide range of psychopathological symptoms share variance that is captured by the *p* factor (Selzam, Coleman, Caspi, Moffitt, & Plomin, 2018). Similarly to the GFP, there are ongoing discussions on whether the *p* factor truly represents general psychopathology or whether it is a mere measurement artifact—e.g., a bias or statistical by-product—(van Bork, Epskamp, Rhemtulla, Borsboom, & van der Maas, 2017). Also similar to the GFP research, however, is that there is substantive evidence that the *p* factor is a relevant construct (Caspi et al., 2014, Lahey et al., 2012; Patalay et al., 2015).

Oltmanns et al. (2018) confirmed earlier predictions (Rushton & Irwing, 2011) that the *p* factor is substantially negatively correlated with the GFP. They speculated that "... *What all of these general factors might have in common, or perhaps how they should be understood, is that they simply reflect the extent of impairment or dysfunction within the respective person's lives, irrespective of the basis for that dysfunction or impairment, whether it be from the presence of a mood disorder, a psy-*

chosis, a PD, or a personality trait." (Oltmanns, Smith, Oltmanns, & Widiger, 2018, p. 587).

In subsequent research, their speculations were supported by empirical evidence because in a sample of outpatients seeking psychological treatment, low GFP and higher *p* factor scores were accompanied with lower scores on the Global Assessment of Functioning (GAF), as provided by their therapists (van der Linden et al., 2021). The GAF is a well-known clinical instrument that therapist can use to assess how patients are able to deal with everyday life. High scores are indicative for a well-adjusted person who can face everyday life challenges in the areas of romance, work, family, and well-being. Low scores, on the other hand, suggest that a person struggles with many life areas and, for example, has difficulties maintaining employment or establishing social or romantic relationships.

In this context, it is relevant to note that the overlap between many psychopathological and personality problems has been established at the genetic level too. (Pettersson, Larsson, & Lichtenstein, 2016). This yields speculations about some of the fundamental causes that connect a wide range of psychological problems. One of the possible explanations is that higher mutation loads may have a general detrimental effect on psychological functioning (Keller & Miller, 2006). When DNA gets copied, mutations occur. As the DNA structure is relatively robust, most of these mutations have no direct or clear effect on behavior, but if they do, in the vast majority of cases, the mutation has a negative impact. Complex traits are not regulated by a single gene, but instead often depend on a wide range of different genes (Krapohl et al., 2016). Yet, mutations in single genes can have broad effects by changing

fundamental aspects of the brain such as neurotransmitters/neuromodulators (e.g., dopamine, norepinephrine) and in such a way can compromise the brain. Indeed, Verweij et al. (2012) reported that their genome-wide analyses indicated that lower scores on a general factor in the personality measures they used, were associated with a higher number of runs of homozygosity; or in other words, higher mutation loads.

All in all, based on the current findings in the literature, we propose that the relationship between the GFP and *p* factor is as follows. The GFP reflects the full continuum of personality, ranging from being the most adjusted and socially effective/desirable person to the most unadjusted, socially and emotional awkward individual. Accordingly, the *p* factor can largely be considered to reflect the negative pole of the GFP continuum. Yet, the *p* factor may not be fully identical to the negative GFP pole as it may also incorporate psychopathological or behavioral problems that fall outside the scope of personality.

The Relevance of the GFP

In the sections above, we emphasized the relevance of the GFP in two applied domains, namely vocational behavior and psychopathology. Yet, this does not directly address the question of why it may be useful to consider the GFP in these domains and how that contributes beyond current knowledge on personality. For example, every step up the personality hierarchy reduces information. Thus, providing people with a single score on personality implies that many details about their character get lost. This point has also been raised by critics of the GFP (Ferguson, Chamorro-Premuzic, Pickering, & Weiss, 2011).

Nevertheless, general principles of science are

parsimony and to search for the most fundamental processes underlying phenomena. In line with these principles, it would not make sense to neglect the possibility that there may be mechanisms that have a very broad influence on personality and would have strong theoretical and practical implications. To illustrate, consider many of the meta-analyses that have been conducted on the Big Five in relation to other variables such as performance, self-esteem, resilience, and burnout (Barrick et al., 2001; Oshio, Taku, Hirano, & Saeed, 2018; Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001; Swider & Zimmerman, 2010). Quite often these meta-analyses show associations that follow an O+, C+, E+, A+, and N- pattern. If one considers personality dimensions, such as the Big Five, truly independent then it would not be obvious why such a pattern is found so often in this field. In addition, based on the independence assumption, scholars would have to come up with differential theories for each relationship between a personality trait and an outcome. From the perspective of the GFP, however, it is possible to provide a more general, and therefore, more parsimonious account of such findings.

From a practical point of view, it is true that statistically predicting behavior is at least just as good, and sometimes better when including the full range of personality dimensions, compared to when only including a GFP. The reason for this is that the full range of dimensions already includes their shared variance (i.e., the GFP), as well as any predictive variance that is unique for the specific trait. Consequently, in regressions in which personality is used to predict outcome X, the level of explained variance attributed to the Big Five, is as high, or higher, than that of the GFP. On the other

hand, a similar phenomenon occurs in the lower hierarchical levels. In regressions, personality facets may explain more variance in outcome X than the Big Five. Or even so, personality items may lead to a higher level of explained variance in X than the facets. This has not caused scholars to maintain the items or facet level of personality and neglect higher-order factors such as the Big Five. In a similar line of reasoning, it should probably not stop scholars from considering the option of a GFP.

Concluding Remarks

Although we already know much about the GFP, it turned out to be rather difficult to establish its exact nature. Based on the current review of literature on the topic it seems unjustified to simply dismiss the GFP as a bias or a factor that interferes with adequate assessment of personality. Doing so, would not be in line with the predictive validity of the GFP across a wide range of outcomes. In addition, denying the potential relevance of the GFP would imply that it also strongly reduces the relevance of other established constructs with which it has shown substantial overlap, to the point of being nearly identical, such as emotional intelligence, social intelligence, ego-resilience, and grit (Dunkel et al., 2021, Dunkel & van der Linden, 2017). Rather than being an artifact, in our view, the most likely option is that the GFP reflects a trait with a broad influence on behavior that may help to understand why some people seem to struggle with many of the everyday challenges that life pose, whereas others know how to regulate themselves and their social behavior in order to achieve their life goals.

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