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Distinguishing General Causality Orientations from Personality Traits

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Abstract

This study investigates the conceptual overlap and distinction between individual differences in the Five-Factor Model and Self-Determination Theory. Participants were 1287 freshmen (age $M = 21.71$; 64% women) who completed electronic questionnaires of dispositional personality traits (NEO-FFI) and general causality orientations (GCOS). Data were analyzed by confirmatory factor analyses. Results revealed that Autonomy items defined a factor separate from personality trait factors, whereas Control and Impersonal items defined both separate factors and showed overlaps with Agreeableness and Neuroticism, respectively. Hence, causality orientations are conceptually distinct from personality traits.

Introduction

This work considers the notion that for personality psychology to move forward, there is a need to *distinguish* and *integrate* different theories and areas of research into a truly comprehensive framework (McAdams & Pals, 2006). Hence, we examine whether the underlying concepts of individual differences in general causality orientations (Deci & Ryan, 1985; 2000) are distinct from those in dispositional personality traits (McCrae & Costa, 2003). Distinguishing these theories is an important step to rule out redundancy, particularly when dealing with individual differences in personality (John, Naumann & Soto, 2008). That is, dominant taxonomies of traits are equated with individual differences in personality. Thus, establishing the conceptual independence of causality orientations from personality traits may serve as a prerequisite for efforts to integrate the two theories (e.g., Deponte, 2004).

Dispositional personality traits are defined as “dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings, and actions” (McCrae & Costa, 2003 p. 25). These dimensions are organized in the Five-Factor Model (FFM). In comparison, general causality orientations are defined as “individual differences in degrees of internalized self-regulation” (Deci & Ryan, 1985, p.111), which are orientations towards stable tendencies in cognition, affect, and behavior. These orientations originate in the well-established and widely researched theory of motivation, Self-Determination Theory (SDT; Deci & Ryan, 2000).

Both the FFM and SDT describe and attempt to explain aspects of personality through stable individual differences. This poses an important question whether the two theories address the same underlying concepts or describe different aspects of personality. Concerns regarding an overlap between the two theories arise mainly from two sources: 1) Descriptions and contents of

personality traits and causality orientations have considerable similarities; 2) traits and orientations are predictors of similar outcome variables, such as well-being and behaviors. These points are elaborated below.

The FFM is recognized as a robust and comprehensive taxonomy of individual differences in personality (McAdams & Pals, 2006). Its dimensional structure was established by factor analyses of personality descriptors, sometimes referred to as the “Big Five” (John et al., 2008); further, the FFM adopts a dispositional theory of traits, as supported by neuro- and biological and genetic correlates, stability in adulthood, and strong predictive validity. The dimensions are: 1) Neuroticism, reflecting a disposition towards intensity and frequency of negative emotions, negative thoughts, and avoidance behavior; 2) Extraversion, reflecting a disposition towards intensity and frequency of positive emotions, positive thoughts, as well as social interaction, and approach/agency behavior; 3) Openness to experience or a tendency towards vivid imagination and tolerance of new ideas, strength of emotions, and self-fulfilling activities; 4) Agreeableness, a tendency towards feelings of trust, believing in the best intentions of others, and behavior guided by communion themes; and 5) Conscientiousness, a disposition towards rational and informed thoughts focused on competencies as opposed to feelings, and behavior guided by achievement themes (McCrae & Costa, 2003).

SDT proponents claim that humans have evolved activity and growth potentials. These potentials are achieved through satisfaction of basic psychological needs: Specifically, the need for autonomy, feeling that one's behavior is self-organized and valued; the need for competence, feeling that one is capable, confident, and effective; and the need for relatedness, feeling that one is connected in relationships and communities (Deci & Ryan, 2000). SDT argues that humans experience social environments as need-facilitating or need-thwarting, and that these

experiences develop into enduring individual differences in internalized self-regulation, namely general causality orientations (Deci & Ryan, 1985).

Individual differences in degrees of internalized self-regulation are operationalized in the General Causality Orientation Scale (GCOS; Deci & Ryan, 1985), which contains three dimensions that have been well-validated in prior research: 1) The Autonomy causality orientation (Autonomy), referring to a tendency towards *high* degrees of internalized self-regulation, such as experiencing behavior and choices as free and volitional and in accordance with one's own standards and beliefs; 2) the Control causality orientation (Control), referring to a tendency towards *low* degrees of internalized self-regulation, such as experiencing behavior and choices as conflicted and pressured by imperatives in social norms and cultural values; and 3) the Impersonal causality orientation (Impersonal), referring to a tendency towards *lacking* degrees of internalized self-regulation, such as experiencing behavior and choices as inefficient, incomprehensible, and beyond intentional control.

To our knowledge, only one previous study has directly investigated the relationship between individual differences in the FFM and SDT (Deponete, 2004). The study applied the NEO-Five Factor Inventory (NEO-FFI) and the GCOS to a sample of 101 Italian students. Autonomy correlated with Extraversion and Agreeableness, Control correlated with reversed Agreeableness, and Impersonal correlated primarily with Neuroticism but also with reversed Extraversion and reversed Conscientiousness. Another study found no associations between Autonomy and traits, but confirmed that “reactive autonomy”, a concept similar to Control, was correlated primarily with reversed Agreeableness but also with Extraversion and Openness (Koestner & Losier, 1996). In addition, other studies have found that “authenticity” (Sheldon, Ryan, Rawsthorne & Ilardi, 1997) and “autonomy support” (La Guardia & Ryan, 2007; Lynch, La Guardia & Ryan, 2009), which are

conceptually similar to Autonomy, were correlated with Extraversion, Openness, Agreeableness, and Conscientiousness, as well as reversed Neuroticism.

However, correlational associations (e.g., Deponte, 2004), may also suggest that personality traits and causality orientations are referring to the same underlying concepts of individual differences, especially if the correlations are sufficiently high (Jöreskog, Sörbom, Du Toit & Du Toit, 2001; Asparouhov & Muthén, 2009). To investigate this question, we apply confirmatory factor analysis (CFA). Below, we explain the traits with which each of the three causality orientations is expected to share conceptual underpinnings.

Autonomy, as an orientation, may share conceptual underpinnings with Extraversion and Agreeableness. Both Autonomy and Extraversion encompass well-being, activity, and engagement in social interaction; and both Autonomy and Agreeableness encompass trust and honesty in social relations (Deci & Ryan, 1985; McCrae & Costa, 2003). In empirical studies, Autonomy (Deci & Ryan, 2000; Deci & Ryan 1985) and Extraversion (McCrae & Costa, 1991; DeNeve & Cooper, 1998) predict well-being states. Autonomy predicts honesty and taking responsibility during disclosure (Hodgins, Yacko, & Gottlieb, 2006). Similarly, Agreeableness predicts using negotiation in resolving conflicts (Jensen-Campbell et al., 2002).

Control may share conceptual underpinnings with reversed Agreeableness. Both Control and low Agreeableness encompass defensive aggression and hostility as well as dishonesty in social relationships (Deci & Ryan, 1985; McCrae & Costa, 2003). In empirical studies, Control predicts aggressive behavior during disclosure (Hodgins et al., 2006). Similarly, low Agreeableness predicts using power in attempts to resolve conflicts (Jensen-Campbell et al., 2002).

Impersonal may share conceptual underpinnings with Neuroticism. Both encompass negative well-being, helplessness, and avoidance behavior (Deci & Ryan, 1985; McCrae & Costa, 2003). In empirical studies, Impersonal (Deci & Ryan, 2000; Deci & Ryan, 1985) and Neuroticism

(McCrae & Costa, 1991; DeNeve & Cooper, 1998) predict negative well-being states. Impersonal predicts defensive and avoidance behavior during disclosure (Hodgins et al., 2006). Similarly, Neuroticism predicts defensive and avoidance behavior (Jensen-Campbell et al., 2002).

To test the predictions an exploratory CFA strategy was adopted. This is because it is unclear which of the correlations (e.g., Deponte, 2004) and content overlaps might refer to the same underlying individual differences constructs, and hence be better explained by either shared or separate latent variables. In such a case, a restricted CFA strategy would test several alternative models, which is inherently an exploratory procedure (Jöreskog et al., 2001). Thus, to limit the number of models tested, we specified models that combine zero cross-loading indicators for personality traits with cross-loading indicators for causality orientations as shown in Figure 1. Personality trait factors then define the structure of the models as in restricted CFA and in accordance with the well-established FFM theory. Simultaneously, the causality orientation indicators are allowed to map freely onto both personality trait and causality orientation factors as in exploratory factor analysis. This procedure is advantageous to restricted CFA, when zero cross-loading indicators cannot be assumed (Asparouhov & Muthén, 2009); while fit statistics and significance levels for all loadings are provided.

Method

Participants

Participants were 1287 students who enrolled at the University of Aarhus in Denmark in August 2007. This sample was representative for the 3738 students enrolling that semester in terms of age ($M=21.72$, $SD=4.43$, $t(3725)=-.99$, $p<.32$). However, women were overrepresented among responders (828 women vs. 457 men and 2 unidentified among responders and 1304 women vs. 1138 men and 9 unidentified among non-responders, $\chi^2(1)=41.90$, $p<.001$).

Recruitment

Participants were recruited in cooperation with the University Registrar's Office. The Registrar sent out an official welcome e-mail to all newly admitted students. The e-mail briefly introduced a self-service portal and invited students to participate in the research project.

Materials

Personality traits were measured by the Danish translation of the NEO-FFI (Costa & McCrae, 2003). NEO-FFI consists of 60 items, which assess the five trait dimensions. Participants were asked to rate general personality statements on 5-point Likert scales ranging from *strongly disagree* to *strongly agree*. Internal reliability for the NEO-FFI subscales can be seen in Table 1.

General causality orientations were measured by the extended version of the GCOS (Deci & Ryan, 1985; Ryan, 1989), which had been translated into Danish, in a previous study (Thomsen, Tønnesvang, Schnieber & Olesen, under review, study 1). This GCOS version consists of 17 short vignettes with 51 items. Each vignette (e.g., having just been turned down for a job) is followed by three prototypical responses, which assess Autonomy, Control, and Impersonal respectively. Participants were asked to rate responses on 7-point Likert scales ranging from *very uncharacteristic* to *very characteristic*. Internal reliability for the GCOS subscales can be seen in Table 1.

Procedure

The Registrar's e-mail provided a link to a set of electronically administered personality and motivation questionnaires (and packages of other questionnaires not relevant to the present study). Reminder e-mails were sent out after approximately two weeks to non-responding

students. Questionnaires were closed after one month. Note that the software was set *not* to accept missing data. Participants who completed all packages of questionnaires were rewarded with a standard personality trait profile. Thus, 589 profiles were sent out after three months.

Analysis

A model for each of the causality orientations was specified and estimated by maximum likelihood using LISREL 8.8 (Jöreskog et al., 2001) based on sample variances and covariances. To obtain a manageable number of observed variables the NEO-FFI items were parceled, two items per observed variable, in accordance with the second order facet level in the FFM hierarchy¹ (Costa & McCrae, 2003). The respective Autonomy, Control, or Impersonal items in each model were not parceled nor restrained, meaning that GCOS items were set to indicate both the five personality factors and a sixth factor. If causality orientation items loaded significantly on the personality trait factors it would be supportive of a conceptual overlap (Jöreskog et al. 2001; Asparouhov & Muthén, 2009); whereas if causality orientation items loaded significantly on their own respective factors, it would be supportive of a conceptual distinction. The general model is presented in Figure 1.

The eigenvalue λ (sums of squared loadings) for GCOS items on each personality trait and causality orientation factor measures the relative contribution of variance explained by each factor. Several goodness-of-fit indices were used to evaluate the models before interpreting GCOS loadings: Chi-square test, root means square error of approximation with 90% confidence intervals (RMSEA; Steiger, 1990), comparative fit index (CFI; Bentler, 1990), and standardized root mean

¹ The Danish translation of NEO-FFI consists of the two items with the highest second order facet-loadings (30 pairs) from the NEO Personality Inventory -Revised.

square residual (SRMR; Jöreskog et al. 2001). Acceptable fits are indicated by a non-significant chi-square, CFI values $>.90$, RMSEA values $<.08$ and SRMR values <1.00 (Hu & Bentler 1999).

Results

Means and standard deviations for NEO-FFI traits and GCOS orientations are reported in Table 1, and correlations between them are reported in Table 2. The results were generally in agreement with expectations from previous studies (e.g., Deponete, 2004). A few small correlations turned out significant, presumably due to the large N.

The first model tested whether Autonomy shared underpinnings with Extraversion and Agreeableness as well as other personality traits. The model provided a reasonably good fit to the data ($\chi^2(939)=4976.08$, $p<.001$; RMSEA=.058 [.056;.059]; CFI=.89; SRMR=.067). Generally, primary loadings ($p<.001$) of GCOS Autonomy items were on the Autonomy factor as expressed in the eigenvalue, $\lambda=1.88$ (Table 3). There were a few exceptions and small cross-loadings (e.g., gcos6b; gcos12a, and gcos14c), mostly on the factors of Extraversion, $\lambda=.45$ and Openness, $\lambda=.50$. This result suggests that Autonomy is conceptually distinct from FFM traits.

The second model tested whether Control shared underpinnings with Agreeableness and other personality traits. The model provided a reasonably good fit to the data ($\chi^2(939)=5324.43$, $p<.001$; RMSEA=.060 [.059;.062]; CFI=.86; SRMR=.066). The majority of primary loadings ($p<.001$) of GCOS Control items were on the Control factor, $\lambda=1.36$ (Table 4). However, there were exceptions and cross-loadings (e.g., gcos2a, gcos5c, gcos6a, gcos7a, gcos12b, gcos14a, and gcos17c), consistently on the Agreeableness factor, $\lambda=.86$. This result suggests that Control is somewhat overlapping with Agreeableness, but predominantly distinct from FFM traits.

The third model tested whether Impersonal shared underpinnings with Neuroticism and other personality traits. The model provided a reasonably good fit to the data ($\chi^2(939)=5435.74, p<.001$; RMSEA=.061 [.059;.063]; CFI=.91; SRMR=.072). Significant cross- and primary loadings ($p<.001$) of GCOS Impersonal items were on both the Impersonal factor, $\lambda=1.76$ as well as the Neuroticism factor, $\lambda=2.04$ (Table 5). There were only a few exceptions and cross-loadings (e.g., gcos5a and gcos6c), mostly on the Extraversion factor, $\lambda=.63$. This result suggests that some aspects of Impersonal are conceptually distinct from FFM traits, whereas other aspects of Impersonal are conceptually overlapping with Neuroticism.

To test whether general causality orientations could be distinguished from dispositional personality traits in a restricted CFA, we specified a fourth model. That is, a subsequent model, in which the NEO-FFI parcels and GCOS-item indicators were restrained to zero cross-loadings on eight distinct factors. A reasonably good fit to the data would support a conceptual distinction between all three orientations and traits. The fourth model provided a reasonably good fit to the data ($\chi^2(3131)=18220.69, p<.001$; RMSEA=.061 [.060;.062]; CFI=.85; SRMR=.078). All loadings were significant ($p<.001$; range for NEO-FFI parcels [.35;.80], mean=.58; range for GCOS items [.12;.61], mean=.41). This result provides additional support that causality orientations are distinct from personality traits.

Discussion

This study is the first to investigate the conceptual overlap and distinction between individual differences in the FFM and SDT. We conducted exploratory CFA of self-reported measures of dispositional personality traits (NEO-FFI) and general causality orientations (GCOS) applied to a large sample of Danish students. The results indicate that Autonomy and aspects of

both Control and Impersonal address individual differences in personality that are not captured by the FFM traits. This was confirmed by a subsequent CFA model, in which all three causality orientations were distinguished from personality traits.

Autonomy as measured by GCOS appears to be a unique concept of individual differences in personality. One central difference is that Autonomy encompasses an internal perceived locus of causality (Deci & Ryan, 1985); that is an understanding of the causes and reasons for one's behavior in social relations. This is supported by studies showing that the free initiation of behavior and volitional choice, as encompassed by Autonomy, predict consistency between attitudes, traits, and behavior (Koestner, Bernieri & Zuckerman, 1992), also referred to as a strong self-integration (Hodgins & Knee, 2002), and an authentic self (Sheldon et al., 1997), or an autonomy-supportive personality (LaGuardia & Ryan, 2007).

Since Autonomy is clearly distinct from personality traits, this opens up the possibility for integrative efforts and calls for research on the relationship between Autonomy and personality traits. It is possible that Extraversion, Openness, Agreeableness and Conscientiousness dispose individuals to experience social environments as need-facilitating, and thus they develop into Autonomous persons. In this understanding, Autonomy would belong to the personality domain of *characteristic adaptations*; that is motivational, social-cognitive, and developmental adaptations of dispositional traits that in contrast to traits are shaped by contingencies in social contexts (McAdams & Pals, 2006; McCrae & Costa, 2003). Another possibility is that need-facilitating environments might independently influence the expression of traits and the development of Autonomy. A third possibility is that Autonomy may cause positive trait expressions of Extraversion, Agreeableness, Openness and Conscientiousness (Sheldon et al., 1997; La Guardia & Ryan, 2007; Lynch et al., 2009). These are empirical questions awaiting further research.

Control as measured by GCOS also appears to be a predominantly unique concept of individual differences in personality. One might argue that Control items showed consistent cross-loadings on the Agreeableness factor, but the relative contribution here was low. Also Control was distinguished in the subsequent eight-factor CFA model. Hence, the Control concept is distinguishable from Agreeableness (e.g., Deponte, 2004). One central difference is that Control encompasses an external perceived locus of causality (Deci & Ryan, 1985); that is a simple and rule-based understanding of the causes and reason of one's behavior in social relations. However, Control is closely related to Agreeableness. Thus, feelings of distrust and believing in the worst intentions of others, as encompassed by low Agreeableness, likely contribute to Control. Likewise, conflicted behavior and pressured choices, as encompassed by Control, negate Agreeableness.

Impersonal as measured by GCOS appears to be both conceptually distinct from and overlapping with Neuroticism. Though Impersonal was distinguished from personality traits in a subsequent eight-factor model, one might still argue that the overlapping features in notable cross-loadings are more important. However, since the theory and psychometrics of Neuroticism are extremely robust (John et al., 2008) the finding that Impersonal items defined a separate latent variable is impressive and deserves further attention.

The Impersonal items that load on the Neuroticism factor seem to address reactions describing negative affect and experiences of incompetence. One example is a vignette where the participant is responding to negative evaluations (gcos4a): “Think that I can't do anything right and feel sad.” Since negative affect is a central characteristic of Neuroticism, it is hardly surprising that Impersonal items describing negative affect can be explained by Neuroticism. However, items with primary Impersonal loadings describe poor coping strategies or perceived helplessness when attempting to resolve social problems. One example is a vignette where the participant is responding to angry outbursts of a friend (gcos15b): “Ignore it, there is nothing you can do.” Even

though Neuroticism includes aspects of avoidance behavior, Impersonal seems to focus more specifically on withdrawal from incomprehensible social encounters and situations in which one does not expect to be able to affect desired outcomes.

Expanding on the item analysis above, one could argue that the Impersonal concept addresses aspects of individual differences distinct from Neuroticism. One central difference is that Impersonal encompasses an impersonal perceived locus of causality (Deci & Ryan, 1985); that is an inability to understand the causes and reasons of one's behavior. Thus, Impersonal presumes a lack of insight leading to both incompetence and deficiency of intentional behavior.

Limitations

The primary limitation of the present study is that the sample consists of university students. Further, the study did not control for an order-effect of presenting the personality measure first. Hence, the results should be replicated in a more representative sample, counterbalancing the questionnaires.

Conclusion and Perspectives

General causality orientations address aspects of individual differences that are conceptually distinct from personality traits. We suggest that causality orientations are characteristic adaptations of dispositional traits (McAdams & Pals, 2006). This proposal has several implications for research in individual differences in personality. First, distinguishing causality orientations from traits provides a stronger rationale for studies examining how autonomy support may influence expressions of certain personality traits (e.g., LaGuardia & Ryan, 2007; Lynch et al., 2009). In addition, this calls for integrative research on the relationship between causality orientations and domain specific and situational expressions of traits. Second, causality orientations may also

influence the relationship between personality and other variables, such as goals, life-stories and well-being. For example, it has been found that consistency between goals, life-stories, and traits is related to higher well-being (McGregor, McAdams & Little, 2006). Following SDT, causality orientations may explain how individuals develop such a consistency.

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Table 1.

Means, standard deviations and Cronbach's α for NEO-FFI and GCOS.

NEO-FFI & GCOS	<u>M</u>	<u>SD</u>	<u>α</u>
Neuroticism	23.49	7.53	.82
Extraversion	31.37	6.82	.82
Openness	31.07	6.50	.74
Agreeableness	29.88	6.38	.75
Conscientiousness	31.73	6.62	.82
Autonomy	101.06	8.32	.78
Control	69.45	10.77	.70
Impersonal	34.31	13.48	.82

Note. $N = 1287$. NEO-FFI = NEO Five-Factor Inventory. GCOS = General Causality Orientation

Scale.

Table 2.

Pearson's correlations between NEO-FFI and GCOS:

GCOS	<u>NEO-FFI</u>				
	N	E	O	A	C
Autonomy	-.09	.33*	.35*	.26*	.22*
Control	-.05	.16*	-.10	-.44*	.01
Impersonal	.52*	-.48*	-.20*	.10*	-.15*

Note. $N = 1287$. Correlations above .30 are given in boldface. NEO-FFI = NEO Five-Factor

Inventory. $N =$ Neuroticism; $E =$ Extraversion; $O =$ Openness; $A =$ Agreeableness; $C =$

Conscientiousness. GCOS = General Causality Orientations Scale. * $p < .001$.

Table 3.

Standardized cross- and primary loadings ($p < .001$), and eigenvalue λ for GCOS Autonomy items:

GCOS Autonomy Items	<u>NEO-FFI</u>					<u>GCOS</u>
	N	E	O	A	C	Autonomy
gcos1c	-.14	.12	.15	-	-	.22
gcos2c	-	-	.14	.13	-	.30
gcos3a	-	-	.12	.18	-	.29
gcos4b	-	-	-	-	.19	.24
gcos5b	-	.26	-	.18	.12	.32
gcos6b	-	.43	.10	-	-	.19
gcos7c	-	-	-	.19	-	.37
gcos8c	.14	-	-	-	.17	.36
gcos9b	-.14	-	.15	-	-	.36
gcos10b	-	.16	.17	.17	-	.45
gcos11a	-	.23	-	-	-	.29
gcos12a	.13	-	.33	-	-	.27
gcos13a	-	-	.20	.11	.18	.43
gcos14c	-	-	.34	.20	.15	.26
gcos15a	-	.22	.18	.16	.12	.42
gcos16a	-	.15	.22	.14	.15	.38
gcos17a	-	.17	.19	-	-	.36
gcos λ	.08	.45	.50	.24	.17	1.88

Note. $N = 1287$. Primary loadings are given in boldface, non-significant loadings are omitted.

NEO-FFI = NEO Five-Factor Inventory. N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness. GCOS = General Causality Orientations Scale.

Table 4.

Standardized cross- and primary loadings ($p < .001$), and eigenvalue λ for GCOS Control items:

GCOS Control Items	<u>NEO-FFI</u>					<u>GCOS</u>
	N	E	O	A	C	Control
gcos1b	-	.14	-.12	-.24	-	.50
gcos2a	-	-	-	-.21	-	.14
gcos3b	-	-	-	-.17	-	.21
gcos4c	-	-	-	-.14	-	.16
gcos5c	-	.24	-	-.34	-.12	.23
gcos6a	-	.36	-	-	-	.14
gcos7a	-	.17	-	-.32	-	-
gcos8b	-	-	-	-.20	-	.23
gcos9c	-	.20	-	-.32	-	.52
gcos10a	-	-	-	-.25	-	.26
gcos11b	-	.21	-	-.26	-	.49
gcos12b	-	.19	.22	-.15	-.13	.19
gcos13c	-	-	-.15	-.13	-	.27
gcos14a	-	-	-	-.21	-	-
gcos15c	-	-	-	-.16	-	.26
gcos16c	-	-	-.15	-.19	-	.29
gcos17c	-	-	-	-.28	-	.24
gcos λ	0	.36	.11	.86	.03	1.36

Note. $N = 1287$. Primary loadings are given in boldface, non-significant loadings are omitted.

NEO-FFI = NEO Five-Factor Inventory. N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness. GCOS = General Causality Orientations Scale.

Table 5.

Standardized cross- and primary loadings ($p < .001$), and eigenvalue λ for GCOS Impersonal items:

GCOS Impersonal Items	<u>NEO-FFI</u>					<u>GCOS</u>
	N	E	O	A	C	Impersonal
gcos1a	.53	-	-.13	.31	-	.26
gcos2b	.49	-	-.22	.25	-	.17
gcos3c	.20	-	-	.16	-	.28
gcos4a	.71	-	-.15	.15	.13	.10
gcos5a	.12	-.31	-.16	-	-	.19
gcos6c	.23	-.51	-	-	.12	.18
gcos7b	.26	-.13	-.21	-	-.11	.40
gcos8a	.43	-	-.20	.14	-	.21
gcos9a	.51	-	-.21	.24	.12	.29
gcos10c	-	-.21	-.17	-	-	.43
gcos11c	.11	-	-.23	.10	.11	.26
gcos12c	.59	-	-	.11	.13	-
gcos13b	.19	-	-.26	-.21	-.13	.28
gcos14b	-	-.19	-	-	-	.46
gcos15b	-	-.31	-	-.15	-.17	.56
gcos16b	-	-.22	-.14	-.15	-.16	.40
gcos17b	-	-.17	-	-	-	.45
gcos λ	2.04	.63	.41	.40	.16	1.76

Note. $N = 1287$. Primary loadings are given in boldface, non-significant loadings are omitted.

NEO-FFI = NEO Five-Factor Inventory. N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness. GCOS = General Causality Orientations Scale.

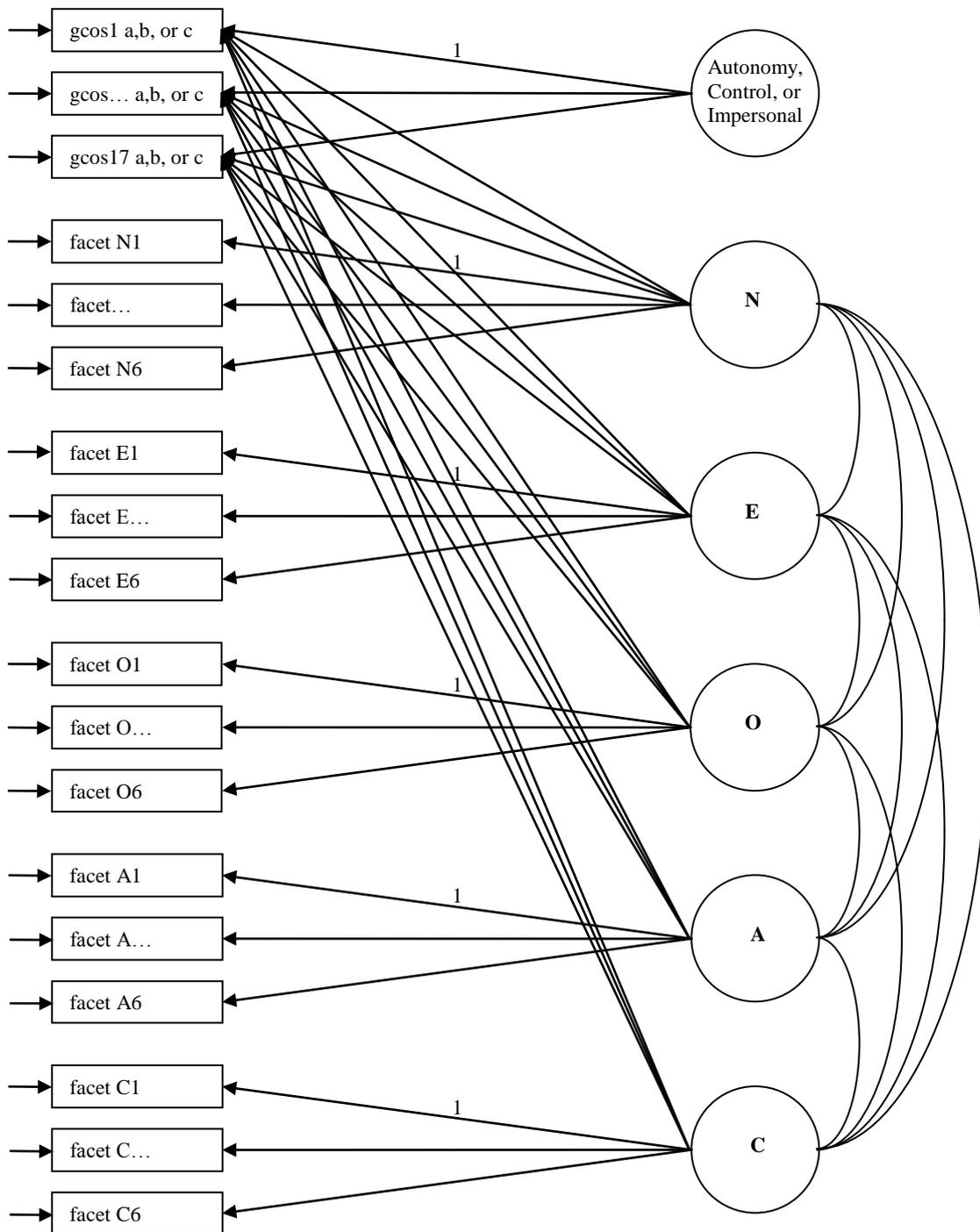


Fig. 1. *The general model. Factors were scaled using unit loading identification constraints and the covariances between causality orientation and personality trait factors were set to zero. N = Neuroticism; E = Extraversion; O = Openness; A = Agreeableness; C = Conscientiousness.*