

## Patterns of Self-Regulation and the Big Five

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### Abstract

*The authors examined relations between self-regulatory properties of personality (ego-control and ego-resilience) and the Big Five. Ego-control and ego-resilience were independent predictors of each Big Five dimension. Additionally, cluster analysis suggested four replicable 'types'. Participants in the first (largest) cluster reported the highest levels of resilience and moderately low levels of control. The second cluster reported above-average resilience and high control. The third cluster reported below-average resilience and extremely low control. The final cluster reported very low resilience and high control. The four clusters differed systematically in their Big Five profiles. These findings suggest that self-regulatory processes are co-ordinated with other basic personality dimensions, and attest to the utility of conducting both variable-centred and person-centred analyses. Copyright © 2004 John Wiley & Sons, Ltd.*

### INTRODUCTION

Self-regulation is the capacity to plan and execute control over one's behaviour (Baumeister, 1998; Gaertner, Sedikides, Vevea, & Iuzzini, 2002; Sedikides, Campbell, Reeder, Elliot, & Gregg, 2002). Psychological theorists increasingly have placed an emphasis on self-regulatory processes as a central factor underlying human motivation and emotion. For Freud (1923/1961), self-regulation fell under the domain of the ego, which was presumed to mediate among the unconscious impulses of the id, the moral inhibitions and ideals of the superego, and the external demands and constraints of reality. Freud perceived the id as the driving force of personality. The role of self-regulatory processes

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gained prominence among ego psychologists. In particular, White (1959) maintained that the ego serves inherent self-regulatory motivations for effectance and competence. Among contemporary self and motivation researchers, the term 'ego' is seldom used; however, the emphasis on self-regulatory processes continues (Carver & Scheier, 1981; Deci & Ryan, 2000; Higgins, 1987, 1996; Sedikides & Gregg, 2003; Sedikides & Strube, 1997).

The capacity for self-regulation has also been conceptualized as an individual difference variable. The overwhelming majority of trait theorists incorporate self-regulatory capacity, in some form, into their personality frameworks. A thumbnail list of examples includes control (Gough, 1987), impulsivity (Buss & Plomin, 1984), superego strength (Cattell, 1943), prudence (Hogan, 1986), and constraint (Tellegen, unpublished manuscript). More recently, the Five-Factor Model (FFM) of personality has been proposed as a 'standard vocabulary or nomenclature' (John, 1990, p. 66) to be adopted by researchers. According to its advocates, the dimensions of the FFM represent the fundamental ways in which persons differ (Goldberg, 1990; McCrae & John, 1992; Wiggins & Trapnell, 1997). Of the FFM dimensions, conscientiousness perhaps best reflects the notion of individual differences in the capacity for self-regulation.

Is self-regulatory capacity, however, simply one dimension of personality? We believe, to the contrary, that self-regulatory processes underlie many different dimensions of personality. That is, individual differences in self-regulation generate patterns of emotional and behavioural responses, and these patterns are represented by descriptive models of personality, such as the FFM. The purpose of this article is to examine how properties of self-regulation inter-relate with other dimensions of personality. We present a prominent theoretical framework that highlights self-regulatory processes, and we subsequently consider the relation of this framework to the descriptive dimensions of the FFM.

### **Self-regulatory dimensions of personality: ego-control and ego-resilience**

Jack and Jeanne Block have developed a theoretical framework focusing on two properties of personality, which they label *ego-control* and *ego-resiliency* (Block, 1971; Block & Block, 1980). These two properties reflect individual differences in self-regulation—the ability and tendency to control immediate urges and desires in the service of long-term goals and intentions. Such control, for example, is achieved through delayed gratification or inhibition of aggressive impulses.

#### *Ego-control*

One of these properties, ego-control, is related to the *permeability* of the self-regulatory system. Persons with highly permeable systems (undercontrollers) express their motivations and emotions immediately and directly. As a result, they are spontaneous, approach oriented, and original in thought and action, but also distractible and impulsive. Persons with highly impermeable systems (overcontrollers) inhibit their motivations and emotions. They are planful and organized, but also avoidant and intolerant of ambiguity.

There is considerable empirical support for ego-control as a key self-regulatory property. For example, children high in ego-control show greater frustration tolerance by behaving more constructively under conditions of frustration (e.g. following separation from a preferred toy) than children low in ego-control (Block & Martin, 1955). Similarly, adolescents high in ego-control show a greater ability to delay gratification by being more likely than those low in ego-control to decline initially small payments in favour of much larger payments in the future (Funder & Block, 1989). Low levels of ego-control predict drug use (Block, Block, & Keyes, 1988) and smoking behaviour (Barefoot, Smith,

Dahlstrom, & Williams, 1989). In short, undercontrollers think freely and act at whim, whereas overcontrollers think reservedly and act with restraint.

It is important to emphasize that, as defined by the Blocks, the tendency to be overcontrolled is neither more nor less adaptive than the tendency to be undercontrolled. Indeed, our previous work (Gramzow, Sedikides, Panter, & Insko, 2000) indicates that ego-undercontrol is positively associated with hardiness (Kobasa, 1979) and ego-strength (Barron, 1953). Instead, adaptability is influenced by a second property of the self-regulatory system, ego-resilience.

### *Ego-resilience*

The property of ego-resilience is related to the *elasticity* of the self-regulatory system (Block, 1971; Block & Block, 1980). Elasticity reflects the person's ability to modulate his or her degree of impulse control in response to situational demands, irrespective of his or her characteristic level of ego-control. For example, resilient persons who tend toward undercontrol are capable of delaying gratification when necessary (e.g. by choosing to study rather than going out with friends on the evening before an important examination). Likewise, resilient persons who tend toward overcontrol are capable of emotional expression when situational demands are strong (e.g. by 'getting down' on the dance floor during a relative's wedding). By contrast, persons with brittle self-regulatory systems (low in ego-resilience) tend to respond at their characteristic level of ego-control, regardless of the context. Thus, brittle persons who tend toward undercontrol have difficulty delaying gratification (leading them to party with friends rather than study). Likewise, brittle persons who tend toward overcontrol have difficulty expressing themselves emotionally (resulting in awkward performances on the dance floor).

As with ego-control, there is substantial empirical support for the validity of the ego-resilience construct. Ego-resilience is associated with higher-order executive functioning, including IQ. Unlike pure IQ, however, ego-resilience predicts competence in interpersonal relations and emotional functioning (Block & Kremen, 1996). The ego-resilient person, in effect, is attuned to the costs and benefits of different behaviours, which requires a capacity to perceive the social context accurately and to act accordingly.

In summary, ego-control and ego-resilience refer to dynamic self-regulatory processes. The Blocks (Block, 1971; Block & Block, 1980) consider these two properties of personality to be generative mechanisms that produce individual differences in emotion, thought, and behaviour.

### **Empirically derived dimensions of personality: the Big Five**

In contrast to the Blocks' theory-based approach, other researchers have focused on the empirical derivation of personality traits. A most important objective of this latter approach has been to identify the key dimensions along which individual differences in emotion, thought, and behaviour occur, using techniques such as factor analysis. The empirical approach traces back to the work of Allport and Odbert (1936), who attempted to identify all the personality-relevant traits within the English language and to assemble these into their core dimensions. Following a succession of refinements (Cattell, 1943; Digman, 1972; Norman, 1963; Tupes & Christal, 1961), this tradition is represented currently by the five-factor model (FFM) of personality (Goldberg, 1990; McCrae & Costa, 1985; Wiggins & Trapnell, 1997).

The FFM is a hierarchical taxonomy in which specific personality traits are characterized by five overarching dimensions. The dimensions of the FFM are well known to most psychologists. *Extraversion* (sometimes referred to as *surgency*) represents the

tendency to be sociable and experience positive affect. *Agreeableness* represents the tendency to be interpersonally pleasant and compliant. Persons high in *conscientiousness* possess task-oriented characteristics such as being dependable, responsible, and orderly. *Neuroticism* (referred to inversely as emotional stability) represents the tendency to experience anxiety and other negative emotions. Finally, *openness to experience* is the most controversial of the five dimensions. Openness reflects a broad range of characteristics such as creativity, interest in intellectual issues, differentiated emotions, unconventional values, aesthetic sensitivity, and need for variety. In summary, these personality dimensions—the ‘Big Five’—are intended to describe the principal ways in which individuals differ in their enduring emotional, interpersonal, experiential, attitudinal, and motivational styles (McCrae & John, 1992).

### **Integrating properties of self-regulation with the Big Five dimensions**

At the conceptual level, ego-control and ego-resilience reflect self-regulatory processes that generate individual differences in emotion, thought, and behaviour. The Big Five represent the primary dimensions along which such individual differences should be apparent. Both approaches have had a substantial influence on personality research and theory. However, these influences largely have paralleled one another, with relatively few researchers considering the issue of how the two perspectives are interrelated. An example of the latter class of researchers is John (1990). In his review of the Big Five, he proposed a relation between ego-control, ego-resilience, and the FFM—a relation that we endorse:

The Big Five and the constructs of Ego Control and Ego Resiliency thus seem to operate at different levels of description: Whereas the Blocks have postulated regulatory processes within the individual that may lead to characteristic behavioural results in different contexts, the Big Five dimensions seem to describe individual differences in the behavioural ‘results’ without directly specifying the nature of the underlying regulatory processes (John, 1990, p. 83).

John attempted to place the ego-control and ego-resilience constructs conceptually within the FFM. He suggested that ego-overcontrol is related to conscientiousness, ego-undercontrol to extraversion, and ego-resilience to both openness and emotional stability. However, he did not provide empirical support for these relations.

Robins, John, Caspi, Moffitt, and Stouthamer-Loeber (1996) did offer an empirical integration. Using an inverse factor analytic approach, they identified three personality types in a large sample of boys aged 12–13. Ego-resilient boys were high in extraversion, agreeableness, conscientiousness, emotional stability, and openness. Undercontrolled boys were high in extraversion and low in agreeableness, but they were less emotionally stable and open than the resilient boys, and they were the least conscientious of the three groups. Finally, overcontrolled boys were high in agreeableness, but were less conscientious and less open than the resilient boys, and they were the least emotionally stable and extraverted of the three groups.

Other researchers have reported similar sets of three personality types, with one type appearing to be resilient, one overcontrolled, and one undercontrolled (Caspi & Silva, 1995; Hart, Hofmann, Edelstein, & Keller, 1997). Indeed, Asendorpf and his colleagues argued that there is sufficient consensus to consider these categories to be the three major ‘replicable’ personality prototypes (Asendorpf, Borkenau, Ostendorf, & van Aken, 2001; Asendorpf & van Aken, 1999). An entire issue of the *European Journal of Personality* was dedicated to this topic (Asendorpf, Caspi, & Hofstee, 2002).

Table 1. CCQ-items significantly associated with the four ego-control/ego-resilience conjunctions (Block &amp; Block, 1980)

	Resilient	Brittle
Undercontrolled	<ul style="list-style-type: none"> <li>• Energetic, active</li> <li>• Curious, exploring</li> <li>• Recoups, resilient</li> <li>• Interesting, arresting</li> </ul>	<ul style="list-style-type: none"> <li>• Restless, fidgety</li> <li>• Undercontrolling of impulse</li> <li>• Externalizing, vulnerable</li> <li>• Brittle, narrow margin of integration</li> <li>• Manipulative</li> </ul>
Overcontrolled	<ul style="list-style-type: none"> <li>• Compliant</li> <li>• Calm, relaxed</li> <li>• Empathic</li> </ul>	<ul style="list-style-type: none"> <li>• Inhibited, constricted</li> <li>• Worrying, anxious</li> <li>• Intolerant of ambiguity</li> <li>• Rigidly repetitive under stress</li> <li>• Interpersonally reserved</li> <li>• Withdraws under stress</li> <li>• Manifests inappropriate affect</li> <li>• Manifests behavioural mannerisms</li> </ul>

We believe, however, that there may be important distinctions between personality types that this three-type model overlooks. Based on the Blocks' theoretical perspective, some resilient persons tend toward high levels of ego-control, whereas other resilient persons tend toward low levels. Hence, behavioural and emotional patterns reflecting high versus low ego-control ought to be distinguishable among resilient persons, just as they are among persons with brittle control systems (although not to as extreme a degree). This point was made by Block and Block (1980) in a table that we have reproduced (Table 1). The entries within each quadrant of this table represent Q-set items (assessed at age 4) that were significantly associated with measures of both ego-control and ego-resilience (assessed at age 3). As this table suggests, the characteristics related both to resilience *and* undercontrol are quite different from those associated with both resilience *and* overcontrol. This implies that it is useful to consider the two self-regulatory properties of ego-control and ego-resilience in combination, rather than merely examining each dimension at the bivariate level. A four-type solution would also be consistent with earlier psychoanalytic approaches to personality, which differentiated not only between neurotic, brittle personality types (Horney, 1945) but also between relatively healthy, resilient personality types (Rank, 1945).

Consistent with this perspective, Robins, John, and Caspi (1998) obtained support for two subtypes within their resilient prototype, based on a re-analysis of data reported by Robins et al. (1996). Boys in the agentic subtype, marked by a tendency toward low ego-control, were high in extraversion and emotional stability. Boys in the communal subtype, marked by a tendency toward high ego-control, were high in agreeableness and conscientiousness. Schnabel, Asendorpf, and Osendorf (2002) also obtained some support for two resilient subtypes. Adults in the well adjusted subtype were high in conscientiousness and emotional stability. In addition to high conscientiousness and stability scores, adults in the assertive subtype also reported high levels of extraversion and openness.

## Overview

There is increasing empirical evidence for an overlap between self-regulatory aspects of personality and the descriptive dimensions of personality offered by the Big Five. The objective of this article is to examine further the notion that a person's combined pattern of ego-resilience and ego-control levels contributes to his or her overall Big Five personality profile. We adopt two, parallel data analytic strategies to investigate these relations.

*Variable-centred approach*

The first strategy adopts a variable-centred approach, based on multiple regression analyses. The question addressed is how measures of ego-control and ego-resilience relate to each of the Big Five dimensions. One possibility is that ego-resilience is related uniquely to certain dimensions of the Big Five (such as emotional stability), whereas ego-control is related uniquely to other dimensions (such as conscientiousness). A second possibility is that the relation between ego-control and ego-resilience is interactive. That is, the effects of ego-control on personality description may be more apparent at low than at high levels of ego-resilience. This would be consistent with previous research suggesting a single ego-resilient group (possessing many positive personality characteristics), but separate overcontrolled and undercontrolled groups that differ dramatically from one another in their personality description. Finally, a third possibility is that the effects of ego-control and ego-resilience are additive. That is, ego-resilience and ego-control may have simultaneous and independent relations to the Big Five dimensions. For example, if ego-resilience and ego-control were both related positively to a given dimension of the Big Five, then this would indicate that persons high in resilience and control possess that trait to the greatest extent, whereas persons low in both resilience and control possess that trait to the least extent.

It is difficult to predict which pattern (unique, interactive, or additive) will best represent the relation between ego-resilience and ego-control in predicting the Big Five. Indeed, it is possible that the pattern of relation between ego-resilience and ego-control will differ across the five dimensions. Regardless, by demonstrating that ego-resilience and ego-control are related to each dimension of the Big Five, we intend to contribute to the further integration of a prominent theory about the role of self-regulation in personality functioning with the standard FFM vocabulary that is adopted increasingly by personality theorists.

*Person-centred approach*

Our second strategy adopts a person-centred approach, based on cluster analytic techniques. The purpose of this strategy is to identify groups of persons with similar patterns of ego-control and ego-resilience. Again, it is difficult to predict with any confidence the exact number of groups (or types) that will result from this analysis. Past research using the person-centred approach has suggested at least three types: resilient, overcontrollers, and undercontrollers (Asendorpf et al., 2001; Asendorpf & van Aken, 1999; Caspi & Silva, 1995). However, given the large proportion typically classified into the resilient category (usually over 50%), it is difficult to imagine that there are no additional, meaningful distinctions among persons. Indeed, our contention that a combination of ego-control and ego-resilience levels contributes to a person's Big Five personality profile would be more consistent with a four-type than a three-type solution.

## METHOD

### Participants

The data reported in this article were collected as part of a larger project examining the structure and dynamics of the self-concept (Gramzow et al., 2000; Hafdahl, Panter, Gramzow, Sedikides, & Insko, 2000). One hundred and ninety-nine introductory psychology students (133 females and 66 males) participated in five 1 h sessions over a 5 week

period. Participants volunteered for the study in order to fulfil a course option. Participants' ages ranged from 18 to 55 years ( $M = 19.78$ ,  $SD = 3.59$ ). Five participants did not complete all of the measures reported in this article.

### Procedure and materials

Sessions were separated by at least one week, but never by more than two weeks. At each session, participants engaged in a card-sorting task and completed a questionnaire packet. Participants completed all measures in the same large room with five to nine other participants. During the first session, each participant completed the California Adult Q-sort (CAQ, described below), and provided demographic information. For the remaining sessions, the order of all measures and card sorts was counterbalanced.

#### *Ego-control and ego-resiliency*

Participants sorted the 100 items in the California Adult Q-Set (CAQ; Block, 1961/1978) using a quasi-normal, nine-category distribution ranging from 1 (*extremely undescriptive*) to 9 (*extremely descriptive*).<sup>1</sup> Block and his colleagues created templates to score ego-resiliency and ego-control based on prototypes provided by nine expert psychologists. Each of the experts sorted the CAQ to describe a prototypical ego-resilient person and a prototypical ego-undercontrolled person. For each CAQ item, the average value at which the experts placed that item was entered into the corresponding template (see Funder & Block, 1989, for a complete description of this procedure, including reliability information).

We constructed separate ego-resiliency and ego-control scores for each participant by calculating correlations between (i) the value at which the participant placed each of the 100 items when providing his or her self-description, and (ii) the value of each item indicated on the ego-resilient and ego-undercontrolled templates. Thus, the possible range of scores for each measure was  $-1.00$  to  $+1.00$ , with higher scores indicating greater ego-resiliency and greater ego-undercontrol, respectively.

#### *Big Five*

Our counterbalancing procedures resulted in participants' completion of the Big Five Inventory (BFI-44; Benet-Martinez & John, 1998) during either the third or the fifth session. Each BFI-44 item is a short active phrase reflecting one of the Big Five personality dimensions. Extraversion items include 'is talkative' and 'has an assertive personality'. Agreeableness items include 'likes to cooperate with others' and 'starts quarrels with others' (reversed). Conscientiousness items include 'does a thorough job' and 'tends to be lazy' (reversed). Neuroticism items include 'gets nervous easily' and 'can be tense'. Openness items include 'has an active imagination' and 'has few artistic interests' (reversed). Participants rated themselves on each phrase using a five-point Likert-type scale (1 = *disagree strongly*; 5 = *agree strongly*). Each of the five subscales was internally consistent (extraversion  $\alpha = 0.88$ ; agreeableness  $\alpha = 0.83$ ; conscientiousness  $\alpha = 0.81$ ; neuroticism  $\alpha = 0.83$ ; openness  $\alpha = 0.79$ ), and all items within each scale showed high item-total correlations.

### Results

Table 2 displays descriptive statistics and bivariate correlations among the primary variables. In this college sample, ego-resilience was correlated positively with

<sup>1</sup>We modified the original CAQ items slightly to make them appropriate for first-person rather than third-person description.

Table 2. Descriptive statistics and bivariate correlations among study variables ( $N = 194$ )

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
1. Ego-resilience	0.44	0.19	—					
2. Ego-undercontrol	0.04	0.16	0.25***	—				
3. Extraversion	3.39	0.84	0.42***	0.50***	—			
4. Agreeableness	3.69	0.66	0.33***	-0.17*	0.20**	—		
5. Conscientiousness	3.58	0.63	0.27***	-0.24***	0.06	0.12	—	
6. Neuroticism	2.93	0.77	-0.48***	0.00	-0.29***	-0.33***	-0.11	—
7. Openness	3.67	0.58	0.20**	0.28***	0.15*	0.07	0.00	-0.03

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

ego-undercontrol. Consistent with the theoretical relation between these two constructs (Block, 1971; Block & Block, 1980), we also obtained evidence for a curvilinear relation between ego-resilience and ego-control ( $\beta = -0.23$ ,  $p < 0.001$ ). As shown in Figure 1, the positive relation between ego-resilience and ego-undercontrol did not hold at the extreme end of the undercontrol dimension. Instead, beyond an optimal level of undercontrol, the relation between resilience and undercontrol became negative.

Table 2 indicates considerable overlap between the self-regulatory properties (ego-resilience and ego-control) and each of the Big Five dimensions. Ego-resilience was associated significantly with all five dimensions. Ego-undercontrol was associated significantly with four dimensions. However, the question remains of whether these effects are independent of one another.

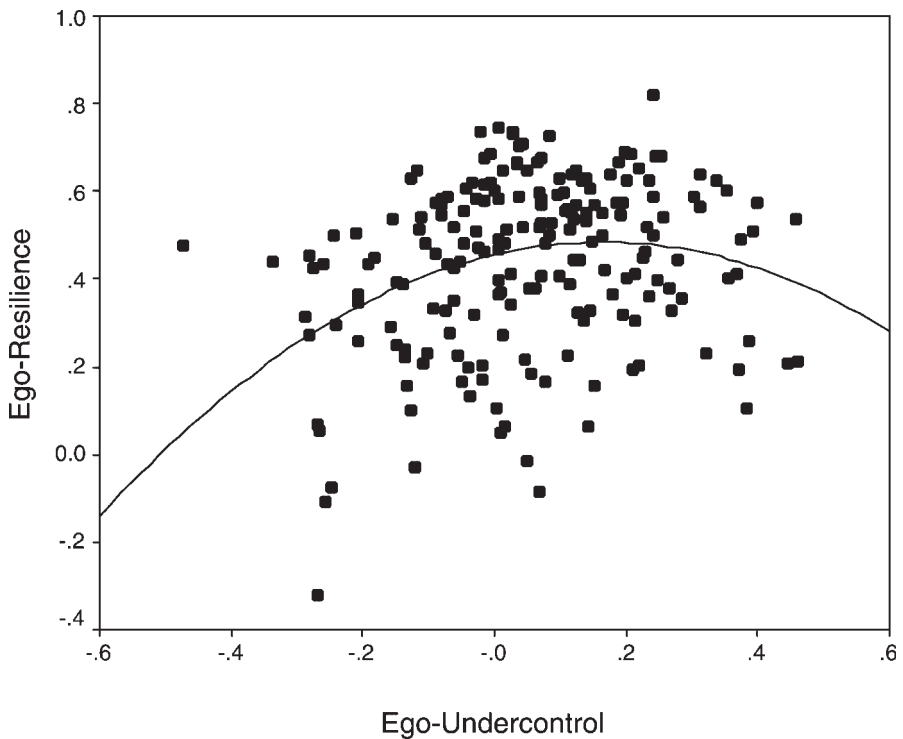


Figure 1. Scatterplot showing curvilinear association between ego-resilience and ego-control.



There were no significant differences between men and women on either ego-control or ego-resiliency ( $p > 0.16$ ). Of the Big Five dimensions, the means for women were marginally higher on agreeableness,  $t(192) = 1.86$ ,  $p = 0.064$ , and significantly higher on neuroticism,  $t(192) = 3.00$ ,  $p = 0.003$ , relative to men.

### Variable-centred approach

We used multiple regression analyses to examine ego-resilience and ego-control as simultaneous predictors of each Big Five dimension. Because women and men differed on several dimensions, we controlled for participant sex in these analyses.<sup>2</sup> In addition, because we were interested in the combined influences of these two properties of self-regulation, we included the ego-resilience  $\times$  ego-undercontrol interaction term in each regression model. None of the interaction terms reached the conventional level of significance, thus they are omitted from the results that follow. Extraversion was related to higher levels of both ego-resilience ( $\beta = 0.30$ ,  $p < 0.001$ ) and ego-undercontrol ( $\beta = 0.40$ ,  $p < 0.001$ ). The same pattern held for openness (resilience  $\beta = 0.15$ ,  $p < 0.05$ ; undercontrol  $\beta = 0.26$ ,  $p < 0.001$ ). Agreeableness was related to higher levels of resilience ( $\beta = 0.41$ ,  $p < 0.001$ ), but lower levels of ego-undercontrol ( $\beta = -0.26$ ,  $p < 0.001$ ). The same pattern held for conscientiousness (resilience  $\beta = 0.34$ ,  $p < 0.001$ ; undercontrol  $\beta = -0.35$ ,  $p < 0.001$ ). Lastly, neuroticism was related to lower levels of ego-resilience ( $\beta = -0.50$ ,  $p < 0.001$ ) and higher levels of ego-undercontrol ( $\beta = 0.14$ ,  $p < 0.05$ ).

### Person-centred approach

We conducted additional analyses to isolate distinct personality types based on participants' ego-resilience and ego-control scores. To derive the types, we adopted a two-step cluster-analysis strategy used by Caspi and Silva (1995). First, we applied Ward's (1963) hierarchical clustering procedure, using squared Euclidean distances (SPSS CLUSTER command). Four solutions (based on two, three, four, and five clusters) were saved for use in the second step. The clusters for each solution were optimized, in the second step, using the  $k$ -mean procedure (SPSS QUICK CLUSTER command, NOUPDATE option). The solutions from the first step provided initial cluster centres. The  $k$ -mean procedure reclassifies participants based on their Euclidean distances from the initial centres, and then recomputes each centre. This reclassify–recompute procedure continues in an iterative fashion until no centre changes by more than 2%.

In addition, we assessed the replicability of each cluster solution using a five-step procedure proposed by Asendorpf and colleagues (2001; see also Breckenridge, 1989). This procedure examines the within-sample replicability of solutions based on different numbers of clusters. First, the full sample was split into random halves. Second, the two-step procedure described above (Ward's method followed by  $k$ -means) was performed on each half (again, saving two-, three-, four-, and five-cluster solutions). Third, participants within each random half of the sample were reclassified based on the cluster centres derived from the other half of the sample in the preceding step (SPSS QUICK CLUSTER command, CLASSIFY option). Fourth, for each half of the sample, the cluster assignments based on the third step were compared with the original cluster assignments using Cohen's

<sup>2</sup>We also tested regression models including the sex by ego-resilience interaction, the sex by ego-control interaction, and the three-way interaction. None of these effects was significant. In addition, given the curvilinear relation between ego-resilience and ego-control, we tested regression models that included quadratic terms. None of these effects was significant.

Table 3. Replicability of different cluster solutions

Solution	Cohen's $\kappa$				
	Mdn	<i>M</i>	SD	Min	Max
2 cluster	0.88	0.86	0.059	0.76	0.93
3 cluster	0.66	0.61	0.150	0.43	0.80
4 cluster	0.78	0.76	0.105	0.56	0.90
5 cluster	0.57	0.57	0.107	0.40	0.73

kappa ( $\kappa$ ). Finally, the  $\kappa$  values for each half of the sample were averaged together. This five-step procedure was performed ten times (i.e., on ten random splits of the total sample).

The replicability estimates (median  $\kappa$  values) across the ten random splits for the two-, three-, four-, and five-cluster solutions are shown in Table 3. A  $\kappa$  value of 0.60 or greater is typically required for a solution to be considered acceptable. Only the five-factor solution failed to meet this criterion. The largest number of replicable clusters in our sample, therefore, was four. In addition, the values associated with this four-factor solution were descriptively superior to those from the three-factor solution. Thus, we examined personality profiles based on these four clusters.<sup>3</sup>

We ordered the clusters based on the number of participants that were classified into each cluster (cluster 1 = 38%, cluster 2 = 27%, cluster 3 = 19%, cluster 4 = 16%). There were no significant differences in the gender composition of the four clusters,  $\chi^2(3, N = 199) = 3.94, p = 0.268$ .

Given that ego-resilience and ego-control were the variables used to define the clusters, we first wanted to characterize each cluster based on the levels of these two variables (Figure 2). The first noticeable pattern is that ego-resilience decreased steadily from cluster 1 to cluster 4,  $F(3, 195) = 200.17, p < 0.001$ . Indeed, each adjacent pair of cluster means differed significantly from one another in ego-resilience ( $p < 0.001$ ). There were also clear differences in levels of ego-control,  $F(3, 195) = 109.90, p < 0.001$ . Clusters 1 and 3 each indicated a tendency toward low ego-control, although cluster 3 was significantly higher in undercontrol than cluster 1,  $t(195) = -6.97, p < 0.001$ . By contrast, clusters 2 and 4 each indicated a tendency toward high ego-control, with no significant difference between them,  $t(195) = -0.80, p = 0.426$ . In summary, the first cluster can be characterized as resilient undercontrollers, the second as resilient overcontrollers, the third as brittle undercontrollers, and the fourth as brittle overcontrollers.

Figure 3 displays the Big Five pattern for each cluster. Consistent with the pattern of ego-resilience, the degree of neuroticism increased steadily from cluster 1 to cluster 4. Resilient undercontrollers (cluster 1) were also characterized by high levels of extraversion, openness to experience, agreeableness, and conscientiousness. Resilient overcontrollers were similar in levels of agreeableness and conscientiousness, but low in extraversion and openness. Participants in the two clusters characterized by low ego-control

<sup>3</sup>The two-cluster solution was also highly replicable. Participants in the larger cluster (reflecting 66.3% of the sample) reported high levels of ego-resilience and a tendency toward undercontrol. Participants in the smaller cluster reported low levels of resilience and a tendency toward overcontrol. The larger cluster also was characterized by significantly higher levels of extraversion and openness, and significantly lower levels of neuroticism, than the smaller cluster. The two clusters did not differ significantly in agreeableness or conscientiousness. Thus, these two clusters do not match any clusters identified by the four-cluster solution. We focus our analyses on the four-cluster solution (which does identify groups that differ in agreeableness and conscientiousness), because we believe that this solution provides a more nuanced categorization of personality patterns within this sample.

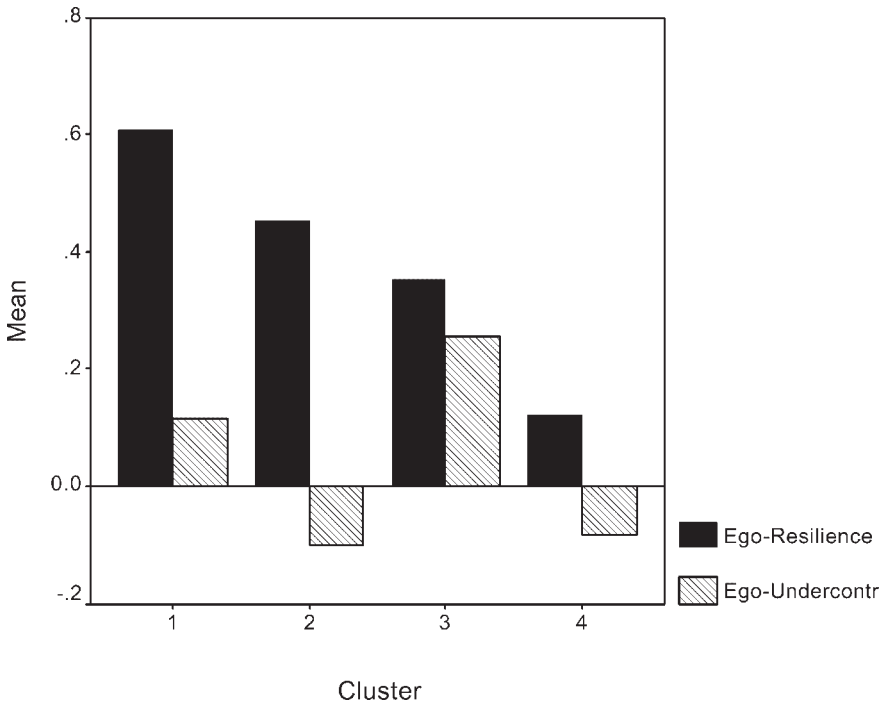


Figure 2. Patterns of ego-resilience and ego-control separated by cluster.

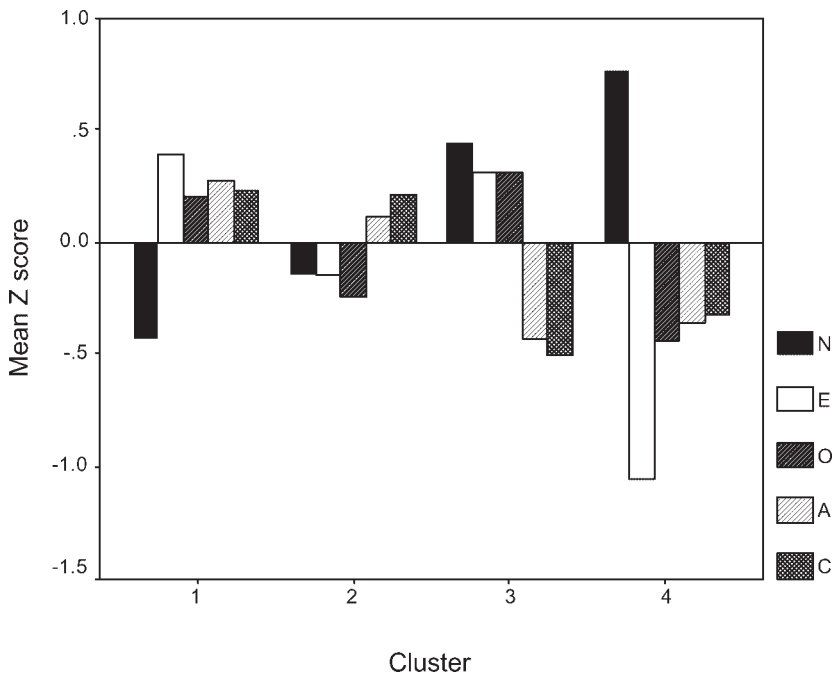


Figure 3. Big Five profiles by cluster.

(clusters 1 and 3) reported greater extraversion and openness to new experience than those in the high ego-control clusters. In addition, participants in the less resilient clusters (clusters 3 and 4) tended to be low in agreeableness and conscientiousness.

## DISCUSSION

The capacity for self-regulation is a fundamental individual difference variable, central to many classic and contemporary theories of personality and motivation. The purpose of this research was to examine the relation between self-regulatory properties of personality functioning (i.e. ego-control and ego-resilience; Block, 1971; Block & Block, 1980) and descriptive dimensions of personality (i.e. the Big Five).

Results from our variable-centred analysis indicated that self-reported ego-control and ego-resilience were related in a curvilinear fashion (see also Asendorpf & van Aken, 1999). Overall, lower levels of ego-control were associated with greater resilience. Beyond an optimum point, however, extreme levels of undercontrol were associated with decreases in resilience (Figure 1).

Despite this association, ego-resilience and ego-control were independent predictors of each Big Five dimension. This finding is consistent with the notion that these two self-regulatory properties are co-ordinated with many different dimensions of personality. In addition, there was no evidence for interactive or curvilinear effects. Thus, the predictive effects of these two self-regulatory variables were additive. This finding implies that a person's standing on one of these variables is informative about his or her personality characteristics, but that his or her standing on the other variable provides additional information. The two constructs are not redundant. The personality implications of a person's combined standing on resilience and control were examined more explicitly through our person-centred cluster analysis.

The cluster analysis strategy (modelled closely after Asendorpf et al., 2001, and Caspi & Silva, 1995) was designed to identify groups of participants who reported similar ego-resilience and ego-control patterns. Based on the replicability criteria recommended by Asendorpf et al. (2001), our sample was well represented by a four-cluster solution. The location of each cluster (or type) in terms of members' standings on the resilience and control dimensions (the variables used in this analysis) is represented in Figure 4. This display offers a revealing vantage point from which to visualize the self-regulatory characteristics of each cluster.

Superimposed on the curvilinear resilience-control pattern, the clusters alternate down from high to low ego-resilience. The alternating sequence reflects shifts from low to high ego-control. The group reporting the most ego-resilience (cluster 1) also reported a moderate tendency toward undercontrol. A more extreme tendency toward undercontrol, however, corresponded to a two-step decrease in resilience (cluster 3). Likewise, a tendency toward overcontrol was associated with either a relatively high (cluster 2) or the lowest (cluster 4) level of resilience. Thus, in our sample (consisting of American college students), a slight tendency toward low ego-control appeared to be optimal.

Big Five profiles further clarified differences among the four clusters (Figure 3). The unique combinations of Big Five traits are similar to personality styles identified by previous personality researchers and theorists. To illustrate, we briefly discuss each cluster as it relates to the system of a prominent personality theorist. We begin by considering the brittle or unresilient patterns of personality, and how they relate to work by Karen Horney

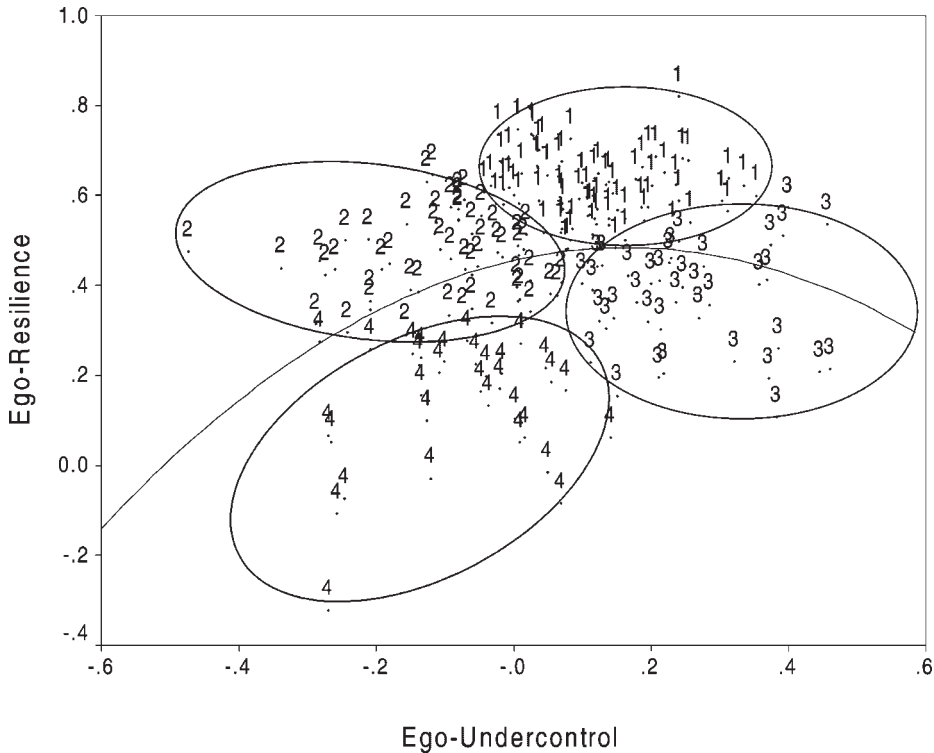


Figure 4. Location of clusters within curvilinear resilience-control pattern.

on neurotic conflict. We then consider the resilient patterns, and how they relate to work by Otto Rank on adaptation to life. We also consider how the set of clusters from our sample compares to personality types reported by other, contemporary researchers.

### Brittle patterns of personality

Trained in the psychoanalytic tradition, Horney (1945) focused her personality theory on neurosis. She argued that personality traits and dispositions are outward manifestations of intrapsychic processes, basing her conclusions largely on clinical case studies. 'What do unresolved conflicts do to our energies, our integrity, and our happiness? . . . primarily a devastating *waste of human energies*, occasioned not only by the conflicts themselves but by all the devious attempts to remove them' (Horney, 1945, p. 154). Although we are concerned with how self-regulatory processes and personality relate within a non-clinical population, we consider Horney's insights to be informative (see also Gramzow et al., 2000).

Both brittle clusters (clusters 3 and 4) are marked by high neuroticism, indicating the experience of negative affect. In addition, participants in each cluster report being disagreeable and unconscientious, suggesting that they have difficulty with social relationships. Differentiating the two clusters is the fact that brittle undercontrollers (cluster 3) are extraverted and open to experience, whereas brittle overcontrollers (cluster 4) are extremely introverted and low in openness. These two brittle patterns are similar to Horney's (1945) description of persons who 'move against' versus 'move away' from others as a result of experiencing inner conflict.

The Big Five profiles suggest that the brittle undercontrolled person is drawn outward, but that resulting interactions with others are likely to be unpleasant due to a hearty degree of social antagonism (disagreeable and unconscientious). Thus, this pattern of self-regulatory characteristics appears to be marked by hostility and spitefulness toward others ('moving against'). This is clearly a maladaptive style of self-regulation, in which the person acts upon his or her impulses, sometimes at the expense of others. Horney characterized this defensive strategy as a tendency to exploit and dominate others, resulting from the perception that 'only the fittest survive and the strong annihilate the weak' (see also Campbell, Reeder, Sedikides, & Elliot, 2000; Sedikides et al., 2002; Sedikides & Gregg, 2001).

By contrast, the brittle overcontrollers reported being socially anxious (neurotic, introverted) and closed to experience. Thus, this pattern of self-regulatory characteristics is marked by withdrawal ('moving away'). This, too, is a maladaptive approach to self-regulation, wherein the person restrains his or her impulses and avoids stimulation (including social stimulation). Horney characterized this defensive strategy as an attempt to seek solitude in order to avoid the 'intolerable strain in associating with people' (Horney, 1945, p. 73).

Interestingly, participants in this cluster reported the worst pattern of psychological adjustment—with the lowest levels of resilience and the highest levels of neuroticism. Thus, brittle undercontrollers fared better than brittle overcontrollers. Indeed, although both brittle clusters were below average in levels of resilience and neuroticism, the Q-sorts for brittle undercontrollers correlated reasonably well with the ego-resilient prototype (see Figure 2). Apparently, there are psychological benefits to extraversion and openness, even within the context of a relatively brittle self-regulatory style marked by social antagonism.

### Resilient patterns of personality

The majority of research in psychology has focused on negative aspects of human functioning. Recently, however, there has been a backlash. An increasing number of researchers contribute toward the positive psychology movement, whose focus is the understanding of what makes human lives most fulfilling (Seligman & Csikszentmihalyi, 2000). The fact that the majority of participants in our sample reported relatively high levels of ego-resilience attests to the relevance of this focus on positive aspects of human motivation and personality.

Both resilient clusters (clusters 1 and 2) are marked by low levels of neuroticism. In addition, participants in each cluster report being agreeable and conscientious. As with the brittle clusters, what differentiates these two personality types is the fact that resilient undercontrollers (cluster 1) are extraverted and open to experience, whereas resilient overcontrollers (cluster 2) are introverted and low in openness. These two resilient patterns are similar to Rank's (1945) description of *productive* and *adapted* personality styles.

Long before there was an intellectual movement identifying itself as positive psychology, Rank (1945) recognized that people take different paths toward adaptation. He argued that a person's will (ego) leads him or her to strive for autonomy from parents and other forms of authority. This quest for independence is a constant struggle throughout development. He argued that people approach this conflict in different ways, and that these differences shape personality. In addition to a neurotic or conflicted personality type, Rank distinguished between two patterns of personality that reflect adaptive approaches to the struggle for autonomy. The productive or creative type affirms his or her independence and

sense of self by creating an ideal, which serves as a behavioural goal. In effect, productive persons transcend the conflict surrounding autonomy from others by creating and pursuing their own goals and aspirations. The characteristics of Rank's productive type (open, free, self-determined) are quite similar to the Big Five profile (extraverted and open to experience) of the resilient persons who reported relatively low levels of ego-control in our sample (cluster 1).

By contrast, Rank's adapted personality type learns to conform to the norms and values of society. These persons resolve the conflict surrounding autonomy by adopting the culture's goals and standards as their own. Thus, their emotional stability comes from inhibiting pursuit of their own desires and impulses, instead pursuing and adhering to those of society. The characteristics of Rank's adapted type map closely onto those we identified among resilient persons who tend toward high ego-control (cluster 2): agreeable and conscientious with low levels of neuroticism, but relatively introverted and closed to experience.

As with the brittle personality types, a tendency toward undercontrol among resilient persons appeared to be more psychologically adaptive than a tendency toward overcontrol. Participants in the resilient undercontrolled cluster reported the greatest degree of resilience and lowest degree of neuroticism. Apparently, the spontaneity and sociability that probably accompany lower levels of ego-control are advantageous, at least within our US sample of college students (although see Anderson, 1999, Chang, Sanna, & Yang, 2003, and Sedikides, Gaertner, & Toguchi, 2003, for evidence of universality regarding the relation between self and mental health).

### Comparability to previous research on personality types

Our findings are consistent with past literature indicating separate overcontrolled and undercontrolled brittle personality types (Asendorpf et al., 2001; Asendorpf & van Aken, 1999; Boehm, Asendorpf, & Avia, 2002; Caspi & Silva, 1995; Pulkkinen, 1996; Robins et al., 1996; Schnabel et al., 2002; York & John, 1992). Also consistent with our findings, virtually all of these studies have indicated that the brittle overcontrolled group suffers greater psychological maladjustment than its undercontrolled counterpart.

Past research has been less consistent regarding resilient personality types. Robins et al. (1998) reported separate *agentic* (extraverted and open) and *communal* (agreeable and conscientious) subgroups within a larger, resilient group. Schnabel et al. (2002) reported an *assertive* type resembling the resilient undercontrollers in our sample, and a *well adjusted* type resembling our resilient overcontrollers. However, they were unable to replicate this finding using a different sample and personality instrument. Likewise, Boehm et al. (2002) reported assertive and well adjusted subtypes, but only for one of two samples.

In each of these previous studies, the distinction between resilient subtypes emerged following secondary analyses. That is, initial analyses supported only three personality prototypes (resilients, undercontrollers, and overcontrollers), with evidence for the resilient subtypes requiring a within-prototype analysis. As noted by Schnabel et al. (2002), it is possible that 'more specific and subtle individual differences... remain undetected in the noise of broader variance' (p. s9). In the present study, however, an internally replicable four-cluster solution emerged straight away, when focusing on the entire sample. Indeed, based on the full sample, the replicability estimates for the three-cluster solution (while acceptable) were smaller than those for the four-cluster solution.

Several methodological differences between the present study and previous research may account for this disparity. For example, Robins et al. (1996, 1998) derived a

three-type solution based on inverse factor analyses of 100 Q-set items. Our four-type solution was determined by a cluster analysis using two subscales (ego resilience and ego undercontrol) computed from 100 Q-set items. We elected not to replicate the strategy of Robins et al., because the psychometric assumptions for inverse factor analysis include the requirement that the sample consist of more items than participants (Gorsuch, 1983). Our sample, consisting of 100 items and 199 participants, did not satisfy this requirement. In addition, Robins et al. analysed Q-sorts provided by observers, whereas our analysis was based on self-generated Q-sorts. It is possible that respondents are more discerning when rating the self than when rating others (Prentice, 1990).

The methodology of the present study also differed from work by Asendorpf and his colleagues (Asendorpf & van Aken, 1999; Asendorpf et al., 2001; Boehm et al., 2002; Schnabel et al., 2002). In particular, our cluster analysis was based on two scales: ego-resilience and ego-control. By contrast, cluster analyses carried out by Asendorpf and colleagues have typically been based on five scales: neuroticism, extraversion, openness, agreeableness, and conscientiousness. The utilization of different personality scales resulted from slightly different research questions. In the present study, we were interested in individual differences in patterns of self-regulatory processes, specifically. Asendorpf and colleagues have been interested in personality types that underlie the Big Five, specifically. Still, it has yet to be determined whether our four-cluster solution based on ego-resilience and ego-control scores will replicate in independent samples.

Finally, future research should explore the link between self-regulatory properties and childhood temperament. For example, Graziano and his colleagues have argued that temperament is the 'biologically based, emotional core of personality' (Graziano, Jensen-Campbell, & Sullivan-Logan, 1998, p. 1273). Several measures of temperament, such as *adaptability* and *approach-withdrawal*, resemble the constructs of ego-resilience and ego-control that we focus on in the present study. It seems plausible that temperament (combined with socialization) shapes later patterns of self-regulation.

### Summary and conclusion

In this article, we have examined relations between self-regulatory properties of personality functioning (ego-control and ego-resilience) and the descriptive personality dimensions represented by the Big Five (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience). The results confirmed that ego-control and ego-resilience, when considered in combination, are related to each of the Big Five dimensions. More importantly, we found evidence for four distinct self-regulatory styles (combinations of ego-resilience and ego-control), each associated with a distinct pattern of personality description. These findings affirm the notion that self-regulatory processes are co-ordinated with core dimensions of personality: self-regulation and personality functioning go hand in hand (Block, 2002; Caspi, 1998). We hope that future investigations will further explore the link between self-regulatory and dimensional facets of personality using multiple methodologies, thus bridging these two somewhat disparate research traditions.

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## REFERENCES

- Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. *Psychological Monographs*, 47 (No. 211).
- Anderson, C. A. (1999). Attributional style, depression, and loneliness: A cross-cultural comparison of American and Chinese students. *Personality and Social Psychology Bulletin*, 25, 482–499.
- Asendorpf, J. B., Borkeanu, P., Ostendorf, F., & van Aken, M. A. G. (2001). Carving personality at its joints: Confirmation of three replicable personality prototypes for both children and adults. *European Journal of Personality*, 15, 169–198.
- Asendorpf, J. B., Caspi, A., & Hofstee, W. K. B. (Eds.). (2002). The puzzle of personality types [Special issue]. *European Journal of Personality*, 16(S1).
- Asendorpf, J. B., & van Aken, M. A. G. (1999). Resilient, overcontrolled, and undercontrolled personality prototypes in childhood: Replicability, predictive power, and trait-type issue. *Journal of Personality and Social Psychology*, 77, 815–832.
- Barefoot, J. C., Smith, R. H., Dahlstrom, W. G., & Williams, R. B. (1989). Personality predictors of smoking behaviour in a sample of physicians. *Psychology and Health*, 3, 37–43.
- Barron, F. (1953). An Ego-strength scale which predicts response to psychotherapy. *Journal of Consulting Psychology*, 5, 327–333.
- Baumeister, R. F. (1998). The self. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *Handbook of social psychology* (4th ed., Vol. 1, pp. 680–740). New York: McGraw-Hill.
- Benet-Martinez, V., & John, O. P. (1998). Los Cinco Grandes across cultures and ethnic groups: Multitrait-multimethod analyses of the Big Five in Spanish and English. *Journal of Personality and Social Psychology*, 75, 729–750.
- Block, J. (1971). *Lives through time*. Berkeley, CA: Bancroft.
- Block, J. (1978). *The Q-sort method in personality assessment and psychiatric research*. Palo Alto, CA: Consulting Psychologists Press. (Original work published 1961.)
- Block, J. (2002). *Personality as an affect-processing system: Toward an integrative theory*. Mahwah, NJ: Erlbaum.
- Block, J., Block, J. H., & Keyes, S. (1988). Longitudinally foretelling drug usage in adolescence: Early childhood personality and environmental precursors. *Child Development*, 59, 336–355.
- Block, J., & Kremen, A. M. (1996). IQ and ego-resiliency: Conceptual and empirical connections and separateness. *Journal of Personality and Social Psychology*, 70, 349–361.
- Block, J. H., & Block, J. (1980). The role of ego-control and ego-resiliency in the organization of behaviour. In W. A. Collins (Ed.), *Minnesota symposium on child psychology* (Vol. 13, pp. 39–101). Hillsdale, NJ: Erlbaum.
- Block, J. H., & Martin, M. (1955). Predicting the behaviour of children under frustration. *Journal of Abnormal and Social Psychology*, 51, 281–285.
- Boehm, B., Asendorpf, J. B., & Avia, M. D. (2002). Replicable types and subtypes of personality: Spanish NEO-PI samples. *European Journal of Personality*, 16, s25–s41.
- Breckenridge, J. N. (1989). Replicating cluster analysis: Method, consistency, and validity. *Multivariate Behavioral Research*, 24, 147–161.
- Buss, A. H., & Plomin, R. (1984). *Temperament: Early developing personality traits*. Hillsdale, NJ: Erlbaum.
- Campbell, W. K., Reeder, G., Sedikides, C., & Elliot, A. J. (2000). Narcissism and comparative self-enhancement strategies. *Journal of Research in Personality*, 34, 329–347.
- Carver, C. S., & Scheier, M. G. (1981). *Attention and self-regulation: A control theory approach to human behaviour*. New York: Springer.
- Caspi, A. (1998). Personality development across the life course. In W. Damon (Ed.), *Handbook of child psychology* (5th ed., N. Eisenberg (Vol. Ed.), *Social, emotional, and personality development* (Vol. 3, pp. 311–388). New York: Wiley.

- Caspi, A., & Silva, P. A. (1995). Temperamental qualities at age 3 predict personality traits in young adulthood: Longitudinal evidence from a birth cohort. *Child Development*, *66*, 486–498.
- Cattell, R. B. (1943). The description of personality: Basic traits resolved into clusters. *Journal of Abnormal and Social Psychology*, *38*, 476–506.
- Chang, E. C., Sanna, L. J., & Yang, K. (2003). Optimism, pessimism, affectivity, and psychological adjustments in US and Korea: A test of a mediation model. *Personality and Individual Differences*, *34*, 1195–1208.
- Deci, E. L., & Ryan, R. M. (2000). The 'what' and 'why' of goal pursuits: Human needs and the self-determination of behaviour. *Psychological Inquiry*, *11*, 227–268.
- Digman, J. M. (1972). The structure of child personality as seen in behaviour ratings. In R. M. Dreger (Ed.), *Multivariate personality research* (pp. 587–611). Baton Rouge, LA: Claitor's.
- Freud, S. (1961). The ego and the id. In J. Strachey (Ed. and Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 19, pp. 3–66). London: Hogarth. (Original work published 1923.)
- Funder, D. C., & Block, J. (1989). The role of ego-control, ego-resiliency, and IQ in delay of gratification in adolescence. *Journal of Personality and Social Psychology*, *57*, 1041–1050.
- Gaertner, L., Sedikides, C., Vevea, J., & Iuzzini, J. (2002). The 'I,' the 'We,' and the 'When:' A meta-analysis of motivational primacy in self-definition. *Journal of Personality and Social Psychology*, *83*, 574–591.
- Goldberg, L. R. (1990). An alternative 'description of personality': The Big-Five factor structure. *Journal of Personality and Social Psychology*, *59*, 1216–1229.
- Gorsuch, R. L. (1983). *Factor analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Gough, H. G. (1987). *The California Psychological Inventory administrator's guide*. Palo Alto, CA: Consulting Psychologists Press.
- Gramzow, R. H., Sedikides, C., Panter, A. T., & Insko, C. A. (2000). Aspects of self-regulation and self-structure as predictors of perceived emotional distress. *Personality and Social Psychology Bulletin*, *26*, 188–206.
- Graziano, W. G., Jensen-Campbell, L. A., Sullivan-Logan, G. M. (1998). Temperament, activity, and expectations for later personality development. *Journal of Personality and Social Psychology*, *74*, 1266–1277.
- Hafidahl, A. R., Panter, A. T., Gramzow, R. H., Sedikides, C., & Insko, C. A. (2000). Free-response self-discrepancies across, among, and within FFM personality dimensions. *Journal of Personality*, *68*, 111–151.
- Hart, D., Hofmann, V., Edelstein, W., & Keller, M. (1997). The relation of childhood personality types to adolescent behaviour and development: A longitudinal study of Icelandic children. *Developmental Psychology*, *33*, 195–205.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*, 319–340.
- Higgins, E. T. (1996). The 'self-digest': Self-knowledge serving self-regulatory functions. *Journal of Personality and Social Psychology*, *71*, 1062–1083.
- Hogan, R. (1986). *Hogan Personality Inventory manual*. Minneapolis, MN: National Computer Systems.
- Horney, K. (1945). *Our inner conflicts: A constructive theory of neurosis*. New York: Norton.
- John, O. P. (1990). The 'Big Five' factor taxonomy: Dimensions of personality in the natural language and in questionnaires. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 66–100). New York: Guilford.
- Kobasa, S. C. (1979). Stressful life events, personality, and distress: An inquiry into hardiness. *Journal of Personality and Social Psychology*, *37*, 1–11.
- McCrae, R. R., & Costa, P. T. (1985). Updating Norman's adequate taxonomy: Intelligence and personality dimensions in natural language and in questionnaires. *Journal of Personality and Social Psychology*, *49*, 710–721.
- McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, *60*, 175–215.
- Norman, W. T. (1963). Toward an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings. *Journal of Abnormal and Social Psychology*, *66*, 574–583.

- Prentice, D. A. (1990). Familiarity and differences in self- and other-representations. *Journal of Personality and Social Psychology*, 59, 369–383.
- Pulkkinen, L. (1996). Female and male personality styles: A typological and developmental analysis. *Journal of Personality and Social Psychology*, 70, 1288–1306.
- Rank, O. (1945). *Will therapy and truth and reality*. New York: Knopf.
- Robins, R. W., John, O. P., & Caspi, A. (1998). The typological approach to studying personality. In R. B. Cairns, L. R. Bergman, & J. Kagan (Eds.), *Methods and models for studying the individual* (pp. 135–160). Beverly Hills, CA: Sage.
- Robins, R. W., John, O. P., Caspi, A., Moffitt, T. E., & Stouthamer-Loeber, M. (1996). Resilient, overcontrolled, and undercontrolled boys: Three replicable personality types. *Journal of Personality and Social Psychology*, 70, 157–171.
- Schnabel, K., Asendorpf, J. B., & Osendorf, F. (2002). Replicable types and subtypes of personality: German NEO-PI-R versus NEO-FFI. *European Journal of Personality*, 16, s7–s24.
- Sedikides, C., Campbell, W. K., Reeder, G., Elliot, A. J., & Gregg, A. P. (2002). Do others bring out the worst in narcissists? The 'Others Exist for Me' illusion. In Y. Kashima, M. Foddy, & M. Platow (Eds.), *Self and identity: Personal, social, and symbolic* (pp. 103–123). Mahwah, NJ: Erlbaum.
- Sedikides, C., Gaertner, L., & Toguchi, Y. (2003). Pancultural self-enhancement. *Journal of Personality and Social Psychology*, 84, 60–70.
- Sedikides, C., & Gregg, A. P. (2001). Narcissists and feedback: Motivational surfeits and motivational deficits. *Psychological Inquiry*, 12, 237–239.
- Sedikides, C., & Gregg, A. P. (2003). Portraits of the self. In M. A. Hogg, & J. Cooper (Eds.), *Sage handbook of social psychology* (pp. 110–138). London: Sage.
- Sedikides, C., & Strube, M. J. (1997). Self-evaluation: To thine own self be good, to thine own self be sure, to thine own self be true, and to thine own self be better. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 29, pp. 209–269). New York: Academic.
- Seligman, M. E. P., & Csikszentmihalyi, M. (Eds.). (2000). Positive psychology [Special issue]. *American Psychologist*, 55(1).
- Tupes, E. C., & Christal, R. C. (1961). *Recurrent personality factors based on trait ratings* (Technical Report No. ASD-TR-61-97). Lackland Air Force Base, TX: US Air Force.
- Ward, J. H. (1963). Hierarchical grouping to optimize an objective function. *Journal of the American Statistical Association*, 58, 236–244.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review*, 66, 297–333.
- Wiggins, J. S., & Trapnell, P. D. (1997). Personality structure: The return of the big five. In R. Hogan, J. A. Johnson, & S. R. Briggs (Eds.), *Handbook of personality psychology* (pp. 737–765). San Diego, CA: Academic.
- York, K. L., & John, O. P. (1992). The four faces of Eve: A typological analysis of women's personality at midlife. *Journal of Personality and Social Psychology*, 63, 494–508.