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Development of the Supernormality Scale-Revised and Its Relationship with Psychopathy

ABSTRACT: The current research addresses the psychometric and diagnostic qualities of the Supernormality Scale-Revised (SS-R), a self-report measurement. Supernormality is defined as the tendency to systematically deny the presence of common symptoms (e.g., intrusive thoughts). In study 1, the SS-R was administered to forensic patients ($n = 63$), psychiatric patients ($n = 26$), honestly responding students ($n = 26$), and students instructed to fake supernormality ($n = 20$). Findings indicated good test–retest stability, and adequate internal consistency. Furthermore, the SS-R showed overall good predictive and convergent validity. Moreover, the diagnostic accuracy was excellent (sensitivity and specificity being 0.80 and 0.92, respectively). In study 2, 115 (healthy) controls and 32 forensic patients completed the SS-R and the Psychopathic Personality Inventory (PPI) (*J Pers Assess* 1996;**66**:488), an instrument measuring psychopathy. Results showed again that the SS-R is a reliable and valid instrument. However, supernormality was not related to psychopathy as measured by the PPI.

KEYWORDS: forensic science, supernormality, psychopathy

According to the DSM-IV-TR (1), malingering is defined as the exaggeration of psychiatric symptoms. Another kind of simulation is the exaggeration of positive features, so-called faking good (2). The prevalence of different types of deceptive behaviors may depend on the precise goals that people want to achieve. For example, an adult who has a lengthy history of antisocial behavior and who is facing a long prison sentence may be motivated to feign insanity in an attempt to avoid a long and harsh incarceration. Time spent in a mental health institution seems less difficult than being sent to prison, especially when the individual has prior experiences with incarceration. However, this could change when this person is already serving his time in a mental institution; he then might be motivated by different factors. Exhibiting signs of mental illness may prolong his stay in a mental hospital. Thus, in this context, deception may manifest itself in minimizing psychopathology.

Indeed, in the criminal justice system, distortion of self-reports is not uncommon (3–5). In line with this, Walters (6) demonstrated how different forms of simulations might depend on the context in which they occur. In a sample of maximum-security male inmates, the Minnesota Multiphasic Personality Inventory (MMPI) was administered. In a relatively neutral test situation (e.g., entering group therapy), MMPI profiles were inconspicuous. However, when the test situation was used to evaluate whether the inmate was mentally ill enough to keep a single cell, MMPI profiles consisted of high malingering scores. The exact opposite occurred when the test situation was used to evaluate early parole. In this case, MMPI profiles showed high denial scores and underreporting of psychiatric symptomatology. Accordingly, in a recent study of Cima et al. (7), it was investigated whether different forms of deception (i.e., malingering and supernormality) were dependent on the legal context as well as the personality of the participants. The results pointed out that nonpsychopathic participants presented themselves

supernormal regardless of the legal context (e.g., accused and convicted). Moreover, the authors reported that especially psychopathic defendants, as measured with the Psychopathic Personality Inventory (PPI) (8), demonstrated significantly higher malingering scores in the context of pretrial. As a convicted offender, psychopaths did not demonstrate either form of deception (i.e., faking bad or faking good). These results suggest that the occurrence of different forms of deception depends on both legal context and personality traits (7).

As the term malingering is commonly used to refer to faking bad, Cima et al. (2) coined the term supernormality to refer to the deliberate fabrication or gross exaggeration of healthy features (i.e., faking good). It differs from defensiveness, in that supernormality is not just denial of psychiatric symptoms, but it also refers to the tendency to systematically deny the presence of common symptoms (e.g., checking whether you have locked the door; intrusive thoughts). It differs from social desirability in that supernormality does not only depend on social context (2). As there was no measurement to evaluate this concept, the Supernormality Scale (SS) (2) was developed. Although the reliability and validity of the SS were satisfactory (2), the SS contained some psychometric limitations as to the sensitivity and specificity. Proposals for improvements were defined as follows. First, the SS could be improved by identifying more symptoms that are common in a normal population, but which might be minimized by people who want to fake good. Second, to improve its diagnostic parameters, the amount of SS items should be increased. As this research aimed to develop and test the revised version of the SS, these issues will be considered in the first study described below.

According to the DSM-IV-TR (1), malingering is often present in persons with an antisocial personality disorder. As psychopaths are often diagnosed with an antisocial personality disorder (9), one would expect a relationship between psychopathy and malingering as well. However, results regarding the relationship between simulation and psychopathy are mixed. In a study of Gacono et al. (10), psychopaths showed low faking bad scores, while other studies have failed to find a relationship between faking bad and psychopathy (8). As other types of dissimulation like faking good are less intensively investigated with regard to psychopathy, the goal of the

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second study was to investigate the relationship between supernormality and psychopathy. As low scores on the SS-Revised (SS-R) indicate high levels of supernormality, we expect low SS-R scores to be negatively related to a measurement of psychopathy (PPI). In other words, high psychopathic traits would be related to high supernormality. Therefore, besides investigating whether the reliability and validity of the SS-R could be confirmed in a new sample of healthy controls and forensic patients, this second study also aimed to examine whether supernormality is related to psychopathy.

Study 1

The aim of this study was to develop and test a revised self-report scale measuring supernormality, the SS-R, which should provide us with more information on whether patients deny their psychopathology. In this study, reliability and validity of the SS-R were investigated in 89 patients and 46 students.

Methods

Participants

This study involved a sample ($n = 135$) of the following four distinctive groups:

- Forensic patients (psychiatric/criminal): $n = 63$.
- Psychiatric patients (psychiatric/noncriminal): $n = 26$.
- Students (nonpsychiatric/noncriminal): $n = 26$.
- Instructed students (nonpsychiatric/noncriminal): $n = 20$.

The forensic patients were inhabitants of the Rhine Clinics Düren, a maximum-security forensic hospital in Germany. Their mean age was 41.79 (SD = 11.60), ranging from 21 to 70 years of age. The forensic patients were all male. The psychiatric patients were inhabitants of the same clinic, but of a different department. These patients were both male ($n = 17$) and female ($n = 9$), with a mean age of 36.81 (SD = 9.94), ranging from 20 to 58 years of age. The students were all native Germans, studying at Maastricht University (12 men and 34 women). Their mean age was 22.57 (SD = 2.37), ranging from 19 to 31 years of age.

Instruments

Supernormality Scale-Revised—The original SS-R consisted of 56 items based on seven domains, i.e., social desirability (e.g., "I have once done something which was forbidden"), mood disorders (e.g., "I am sometimes overwhelmed by pessimistic feelings and thoughts"), obsessive compulsive symptoms (e.g., "It happens that I have to check whether I had closed the door"), psychotic symptoms (e.g., "When I walk on the street late at night, I have the feeling that I am being followed"), dissociative symptoms (e.g., "Sometimes I imagine myself being in another place"), aggression (e.g., "In some situations I lose my self-control"), and anxiety symptoms (e.g., "I am sometimes afraid of snakes and spiders"). Most items were derived from the SS (2), Dissociative Experiences Scale (DES) (11), and the Revised Hallucination Scale (RHS) (12). Items were selected in such a way that "normal" people experience them on a regular basis in their own life. As a result, "normal" people will provide positive answers on nearly all items. On the contrary, we expect that at least some forensic patients will answer more negatively. By constructing the items, we chose to present a couple of items in an opposite negative way; this means that common people will give a negative answer, for example, "In the future, there is no situation in which I would react aggressively" or "I am never bothered by obsessive thoughts." Forensic patients are believed to answer more positively to these items than common people. Moreover, the test was expanded with 16 bogus items (resulting in a 72-item scale) that were included to mask the real purpose of the scale. The answering format of the SS-R consists of four possibilities, namely, "never," "sometimes," "often," and "always." These answers are scored 1, 2, 3, and 4, respectively, which results in total scores ranging from 56 to 224. As the idea behind the supernormality items is that these include common incidents often experienced by healthy controls, low scores on the SS-R indicate supernormal behavior.

To get an impression of the discriminant validity of the SS-R, i.e., whether it discriminates between dissimilar constructs, a complementary instrument was used: the Paranoia Scale (PS) (13). As the PS measures symptoms of paranoia, it is expected that the relationship between the SS-R and the PS will be positive. More specifically, high levels of paranoia (i.e., a high score on the PS) are expected to correlate with low levels of supernormality (i.e., a high score on the SS-R).

Paranoia Scale

The PS is derived from the MMPI. The items were constructed in a way that they fulfilled at least one of the following aspects of paranoia: (i) belief that your behavior is influenced or your thoughts are controlled by other people or external forces; (ii) belief that people are against you; (iii) belief that some people talk about, refer to, or watch you; (iv) suspicion and mistrust of others' motives; and (v) feelings of ill will, resentment, or bitterness. Suspicious items were left out, and this resulted in a self-report test containing 20 items. Several student samples tested by Fenigstein and Vanable (13) have shown good reliability. Internal consistency coefficients ranged from 0.81 to 0.87, and test–retest reliability was found to be sufficient ($r = 0.70$). Furthermore, construct validity was measured by comparing the PS with conceptually relevant inventories. It was shown that there was good evidence for convergent and discriminant validity.

For this study, the PS had been translated into German. The questionnaire consists of 20 items with four answer possibilities: "not at all applicable," "not applicable," "applicable," and "extremely applicable" (which are scored 1, 2, 3, and 4, respectively). Examples of PS items are: "I sometimes feel as if I am being followed," "I believe that I have often been punished without a cause," "It is safer to trust no one," or "I tend to be on guard with people who are somewhat more friendly than I expected." The PS used in this study differed from the original questionnaire in the amount of answer possibilities. That is, four instead of five options were used in the current study. There were two main reasons as to why we chose an even number. First, it avoids the error of central tendency. Second, compared to "true/false" formats, it provides finer discriminations among participants and results in more reliable scores (8). The total PS score indicates the degree of paranoia; the higher the PS score, the more paranoid one is. Psychometric qualities of the PS in this study showed good test–retest stability ($r = 0.69$) and adequate validity, in terms that patient groups scored higher than healthy control participants [$F(3,131) = 11.37$, $p < 0.01$].

Ethics

Participants were recruited by means of flyers in which information regarding the study was given. After they had signed up for

participation, they were contacted by the researchers for an appointment. Forensic patients were recruited by means of an information letter, by which they could sign in for participation. In the information letter, it was emphasized that participation was voluntary and that they were free to discontinue their participation at any given time. Before starting the study, all participants gave written informed consent.

Procedure

Forensic and psychiatric patients were asked to complete the questionnaires on their own. In case of nonliterate individuals, the questionnaires were read out loud to them by the researcher. All participants were administered the SS-R and PS, and agreed to participate voluntarily in this study.

The group of students was divided into two groups, namely a normal control group and an instructed group. The instruction of this second group was: "Imagine that you are an inmate of a forensic clinic and that you have to complete these questionnaires, which will give an indication whether you are healthy enough to be released. Complete the questionnaires in a way which will result in an early release." Data of this instructed group were gathered to compare them to the results of the forensic group. It was expected that forensic patients and instructed students would minimize their mental and physical problems to gain positive results. This would result in significantly lower SS-R scores than both noninstructed students and psychiatric patients.

Statistics

Reliability of the SS-R was analyzed using test–retest stability and internal consistency (Cronbach's alpha). Validity of the SS-R was calculated using a one-way analysis of variance (ANOVA), with group (forensic patients, psychiatric patients, honestly responding controls, and instructed controls) as between-subject factor. Differences were further inspected using Bonferroni corrected *post hoc* comparison tests. In all cases where differences reached significance, effect sizes (Cohen's *d*) are reported.

To investigate construct validity of the SS-R, Pearson product-moment correlations were computed between SS-R and PS scores. Diagnostic accuracy of the SS-R was investigated by calculating the Positive and Negative Predictive Power (PPP and NPP, respectively).

Results

In this first study, participants completed the total SS-R consisting of 72 items (i.e., 56 items and 16 bogus items). However, as item-total correlations were insufficient for 22 items, analyses were performed with a 34-item scale (excluding the 16 bogus items). All SS-R items, mean scores, their SD, and corrected item-total correlations of the total mixed sample ($n = 135$) are reported in Table 1.

Reliability SS-R

Test–retest stability (8-week interval) of the SS-R was found to be fairly good ($r = 0.79$, $p < 0.01$) in a sample of 12 forensic patients. Mean SS-R scores on the two occasions were 57.3 (SD = 10.3) and 58.9 (SD = 9.8), respectively.

Internal consistency of the SS-R in the mixed sample of 135 participants was excellent, with Cronbach's alpha being 0.88.

Validity SS-R

The scores of four groups were compared, to evaluate the validity of the SS-R. The first group consisted of 63 forensic patients; the second group of 26 noncriminal psychiatric patients; the third group of 26 honestly responding control participants; and the fourth group of 20 instructed control participants. Table 2 demonstrates total SS-R scores for these groups. An ANOVA showed that the groups differed significantly with regard to their mean total SS-R score: $F(3,131) = 6.38$, $p < 0.01$. Follow-up *t*-tests were conducted to evaluate pairwise differences between the groups. Forensic patients had significantly lower scores than those of the psychiatric patients [$t(87) = 1.97$, $p < 0.05$; $d = 0.42$] and the honestly responding control group [$t(87) = 2.64$, $p < 0.01$; $d = 0.57$]. On the other hand, forensic patients did not significantly differ from instructed controls [$t(81) = 1.86$, $p > 0.05$]. Furthermore, the psychiatric patients scored significantly higher than the instructed controls [$t(44) = 3.71$, $p < 0.01$; $d = 1.12$], whereas they did not differ significantly from the honestly responding controls [$t(50) = 0.50$, $p > 0.05$]. Finally, the honestly responding controls scored significantly higher than the instructed controls [$t(44) = 5.20$, $p < 0.01$; $d = 1.57$].

As a second exploration of the construct validity of the SS-R, Pearson product-moment correlations were computed between SS-R scores and PS scores for the total sample ($n = 135$). Mean PS scores of the forensic patients did not differ from those of the psychiatric patients, means being 45.59 (SD = 10.91), and 47.38 (SD = 10.38), respectively [$t(87) = 0.72$, $p > 0.05$], whereas they had significantly higher scores than the honestly responding controls ($M = 39.00$; SD = 8.92; $t(81) = 6.57$, $p < 0.01$; $d = 1.46$]. Supernormality was found to be moderately, but significantly related to paranoia ($r = 0.56$, $p < 0.01$). When the correlations of supernormality and paranoia were examined within the specific groups, it was demonstrated that they were all significant (r ranging from 0.44 to 0.71, all $p < 0.05$).

Diagnostic Accuracy SS-R

To calculate sensitivity, specificity, positive and negative predictive power, the data of honestly responding controls ($n = 26$) and instructed controls ($n = 20$) were pooled. The associated diagnostic parameters (i.e., sensitivity and specificity) are displayed in Table 3.

As can be seen, the optimal cut-off score is 60. At this cut-off, 80.0% of the fakers (instructed controls) were identified correctly (sensitivity), while 92.3% of the nonfakers (honestly responding controls) were classified correctly (specificity). The PPP for this cut-off was 0.88, which indicates that the probability that someone with an SS-R score of 60 or lower was faking, is 88%. The NPP was 0.86. This means that the probability that someone with a score of 61 or higher was responding honestly, is 86%. Sensitivity, specificity, PPP, and NPP rates are shown in Table 4.

Study 2

One of the most prominent characteristics of psychopathy is pathological lying and manipulating others (14). Because of their superficial charm and manipulative behavior (15), it is often assumed that psychopaths are successful malingerers. However, research concerning the relationship between psychopathy and malingering is sparse. Results of studies that did investigate this association are rather mixed. For instance, some studies confirmed the relationship between psychopathy and malingering (10), while

TABLE 1—*SS-R items, mean and their SD, and corrected item-total correlations in a mixed sample of healthy participants, (forensic) psychiatric patients, and criminals (n = 135).*

Items	Mean	SD	Corrected Item-Total r
[1] When I walk on the street late at night, I have the feeling that I am being followed.	1.42	0.63	0.40
[2] When I am in a bad mood, I get irritated and I can react annoyed.	2.0	0.63	0.52
[3] *I like to watch television.*			
[4] Without the help of others, life would actually be more inconvenient.	2.41	0.88	0.36
[5] At some moments I feel mentally confused.	1.75	0.68	0.69
[6] *I love it when the weather is warm.*			
[7] In some situations I lose my self-control.	1.54	0.61	0.54
[8] It sometimes happens that I fantasize being someone else.	1.40	0.64	0.52
[9] I have once done something which was forbidden.	2.15	0.56	0.41
[10] *I like listening to music.*			
[11] I sometimes imagine being in a different place.	2.04	0.79	0.57
[12] I am sometimes overwhelmed by pessimistic feelings and thoughts.	1.53	0.69	0.64
[13] It happens that I have to check whether I had closed the door.	1.86	0.78	0.48
[14] *I prefer sleeping in a dark room.*			
[15] I suffer from mood swings.	2.02	0.62	0.52
[16] I sometimes have the tendency to beat someone.	1.30	0.55	0.40
[17] *I like to read.*			
[18] My fantasies sometimes seem real.	1.94	0.77	0.39
[19] It happens that when I watch in the mirror, I look differently than normal.	1.36	0.58	0.48
[20] *I like to go far away on holiday.*			
[21] It happens that my heart accelerates and I do not know where it comes from.	3.36	0.70	0.51
[22] I have strange fantasies.	1.63	0.74	0.60
[23] It happens that I have trouble concentrating.	2.12	0.68	0.59
[24] *I love to swim.*			
[25] It sometimes happens that I get so bound up in something, that I cannot remember where I am.	1.37	0.53	0.38
[26] I sometimes get so annoyed about someone, I could twist his neck.	1.66	0.68	0.65
[27] *I like sports more than learning.*			
[28] When I get furious, I do not know what I am doing.	1.49	0.81	0.42
[29] It happens that I hear voices which are not there.	1.16	0.40	0.30
[30] *I think dancing is stupid.*			
[31] It happens that I forbid myself to think about something.	1.69	0.70	0.47
[32] There are important events in my life which I cannot remember.	1.68	0.77	0.37
[33] It sometimes happens that I feel sad without knowing the real reason for it.	1.97	0.72	0.43
[34] *I like dull people more than active people.*			
[35] I am never troubled by compulsive acts.	3.71	0.55	0.54
[36] It happens that I feel so ill I do not know what to do anymore.	1.77	0.70	0.54
[37] *I do not have a favorite color.*			
[38] To calm down, I sometimes throw stuff.	1.23	0.52	0.34
[39] Sometimes I am not feeling well, both physical as well as mental.	1.78	0.90	0.51
[40] When I am alone in a big house at night, I sometimes think that I hear footsteps.	1.33	0.54	0.34
[41] *I love big families.*			
[42] I can swear awfully, when I am angry.	2.10	0.79	0.35
[43] *I love animals.*			
[44] It happens that I am so enthusiastic, that thoughts are quickly passing through my head.	2.21	0.86	0.53
[45] *I do find family important.*			
[46] Sometimes when I am alone, I talk to myself.	1.50	0.77	0.39
[47] *I have a lot of friends.*			
[48] It happens that I have very strange thoughts and fantasies.	1.63	0.55	0.53
[49] There is no situation in the presence in which I would react aggressive.	3.21	0.77	0.42
[50] *I like bright colors more than pastel.*			

Items in italics are the 16 bogus items.

TABLE 2—*Mean total SS-R scores, SD, and range of total SS-R scores of the forensic patients (n = 63), noncriminal psychiatric patients (n = 26), honestly responding controls (n = 26), and instructed controls (n = 20).*

Groups	Mean	SD	Range
Forensic patients	61.32	10.83	44–96
Psychiatric patients	66.27	10.67	44–86
Controls	67.58	8.24	48–87
Instructed controls	56.65	5.14	47–68

TABLE 3—*Sensitivity and specificity rates for different SS-R cut-off points (n = 46).*

Cut-off	Sensitivity (%)	Specificity (%)
SS-R score ≤ 55	40.0	92.3
SS-R score ≤ 60	80.0	92.3
SS-R score ≤ 65	90.0	57.7
SS-R score ≤ 70	100	30.8

other more recent studies failed to do so (16). One problem with the psychopathy–malingering association is that one assumes that psychopaths only show one specific type of simulation. More

specifically, one expects psychopaths to exaggerate psychiatric symptoms (i.e., faking bad). However, considering the context (i.e., forensic setting), one may also expect psychopaths to exaggerate

TABLE 4—*Classification and accuracy indices for the pooled data*
(n = 46).

	Reality	
	Instructed Controls	Honest Controls
Test		
SS-R score ≤ 60	16 (CP)	2 (FP)
	80.0%	7.7%
SS-R score ≥ 61	4 (FN)	24 (CN)
	20.0%	92.3%
Sensitivity	0.80	
Specificity	0.92	
PPP	0.88	
NPP	0.86	

Sensitivity = CP/(CP + FN); specificity = CN/(FP + CN); PPP = CP/(CP + FP); NPP = CN/(FN + CN). CP, correct positive; FN, false negative; CN, correct negative; FP, false positive.

normal symptoms and deny psychopathology (i.e., faking good). Therefore, besides confirming the reliability and validity of the 50-item SS-R in 118 students and 34 forensic patients, the relationship between faking good and psychopathy was investigated.

Methods

Participants

The total sample consisted of 152 participants. The control group included 118 native German participants (74 female), with a mean age of 30.0 (SD = 13.2). The forensic patients, who were inmates of the Rhine Clinics Düren, Germany (*n* = 34; only males), had a mean age of 40.0 (SD = 9.3).

Instruments

Supernormality Scale-Revised—We used the 50-item SS-R from study 1 (see above). To investigate test–retest reliability, 22 participants of the control group were asked to complete the questionnaire twice.

Psychopathic Personality Inventory—To measure psychopathic traits, we used the PPI (8). This instrument consists of 187 items. As the questionnaire was administered by German forensic patients, it had to be translated into German. The PPI is a self-report measure that is intended to measure psychopathic features. It was originally designed to measure the core personality features of psychopathy among noncriminal populations, but it turned out to be a good screening instrument among criminal populations as well. Because the PPI was intended to be sensitive enough to capture psychopathic traits in noncriminal populations, the item subtlety of this instrument made it also more difficult for criminal respondents to dissimulate (17). Respondents rate every item on a scale ranging from 1 to 4 ("false," "somewhat false," "somewhat true," and "true"). In this way, a total score can be calculated. The PPI consists of eight subscales and three validity scales, of which scores can be calculated separately.

The first subscale measures Machiavellian Egocentricity. It consists of 30 items and assesses narcissistic and ruthless attitudes in interpersonal functioning. The second subscale of the PPI is the 24-item Social Potency scale. It measures the perceived ability to influence and manipulate others. The third subscale is Coldheartedness and consists of 21 items. It measures a propensity toward callousness, guiltlessness, and lack of sentimentality. The fourth

subscale is called Carefree Nonplanfulness. It consists of 20 items and assesses an attitude of indifference in planning actions. The fifth subscale is Fearlessness and consists of 19 items. It measures the level of absence of anticipatory anxiety concerning harm and a willingness to participate in risky activities. The sixth subscale is called Alienation or Blame Externalization and consists of 18 items. It measures the tendency to blame others for one's problems and to rationalize one's misbehavior. The seventh subscale of the PPI is called Impulsive Nonconformity and consists of 17 items. It measures a reckless lack of concern regarding social norms. The final subscale of the PPI is the 11-item counting subscale Stress Immunity. It assesses the absence of marked reactions to anxiety-provoking events. Furthermore, the PPI consists of three validity scales: (i) Deviant Responding (DR) Scale, which measures malingering; (ii) Unlikely Virtues (UV) Scale, which measures socially desirable impression management; and (iii) Variable Response Inconsistency (VRIN) Scale, which measures inconsistencies in answers, such as careless responding (8,17,18).

Several studies have been carried out to measure psychometric properties of the PPI. Internal consistency of PPI total scores has ranged from 0.90 to 0.93, and for the PPI subscales internal consistency ranged from 0.70 to 0.89 (8). The test–retest stability of the PPI was very good, namely 0.95, and test–retest stabilities of the subscales ranged from 0.82 to 0.94 (8). Scores on the PPI also correlated significantly with scores on Hare's Psychopathy Checklist Revised (PCL-R) (*r* = 0.54), the worldwide-used instrument to determine psychopathy (15). The PPI showed a positive correlation with the PCL-R Factor 1, the core personality traits of psychopathy (19).

Ethics

Procedure regarding recruitment was the same as in study 1. Again, it was emphasized that participation was voluntary and that they were free to discontinue their participation at any given time. Before starting the study, all participants gave written informed consent.

Statistics

Reliability of the SS-R was analyzed using test–retest stability and internal consistency (Cronbach's alpha). Validity of the SS-R was calculated using an independent *t*-test. Effect size (Cohen's *d*) is also reported.

To investigate whether there was a relationship between supernormality and psychopathy, a Pearson product-moment correlational analysis was conducted. Using the PPI median to create a PPI cut-off score, chi-squared analysis was conducted to investigate the association between high psychopathic traits and supernormal behavior.

Results

Reliability SS-R

Of the total of 118 control participants, 22 completed the questionnaire twice. The interval between the two measures was 6 weeks. The mean age of this sample was 39.7 years (SD = 19.8). Test–retest stability of the SS-R total score was high (*r* = 0.86, *p* < 0.01), means being 56.1 (SD = 9.9) and 53.5 (SD = 7.5) in both occasions.

Internal consistency of the SS-R in the mixed sample of 152 participants was fairly good, with Cronbach's alpha being 0.76.

Validity SS-R

The SS-R scores of the two groups were compared to evaluate the validity of the 50-item SS-R. An independent *t*-test showed that the forensic patients demonstrated significantly lower SS-R scores than the control participants, means being 56.06 (SD = 10.68) and 63.16 (SD = 10.46), respectively [$t(150) = 3.47$, $p < 0.01$; $d = 0.57$].

Relationship between SS-R and PPI

To investigate whether there was a relationship between supernormality and psychopathy, a Pearson product-moment correlational analysis was conducted. The correlation between SS-R total score and PPI total score was found to be positive and significant ($r = 0.56$, $p < 0.01$). Supernormality (as indicated by lower SS-R total scores) was related to low levels of psychopathic traits. We used the PPI median to create a PPI cut-off score (365). The chi-squared analysis based on the PPI cut-off score of 365 and the SS-R cut-off score of 60, showed that the relationship between faking good and psychopathy was exactly in the opposite direction than expected. More specifically, although 47% of patients with high PPI scores were supernormal, 94% of patients with low PPI scores were also supernormal [$\chi^2(1) = 9.07$; $p < 0.01$].

Discussion

In the first study, the psychometric qualities of the SS-R were examined. The SS-R is a revision of an earlier developed self-report scale designed to measure supernormality (2). The results presented above show that the psychometric qualities of the revision are much better than those of the original SS (2). To begin with, the two measures of reliability ranged from good test–retest stability to excellent internal consistency. Second, the SS-R displayed good predictive validity, as controls who were instructed to feign supernormal behavior displayed lower scores (indicating higher levels of supernormality) than honestly responding controls and psychiatric patients. Third, the SS-R showed good convergent validity as the SS-R correlated positively and significantly with the PS, demonstrating that supernormality relates negatively with paranoia. Finally, the diagnostic accuracy of the SS-R was impressive. Using a cut-off score of 60, sensitivity and specificity proportions of the SS-R were 0.80 and 0.92, respectively. PPP and NPP were found to be 0.88 and 0.86. Interestingly, these rates are considerably better than the accuracy rates found in the original SS study by Cima et al. (2).

As item-total correlations were insufficient for 22 items, analyses were performed with a 34-item scale (excluding the 16 bogus items). In study 1, participants completed the total SS-R consisting of 72 items (i.e., 56 items and 16 bogus items). In addition, a second study was performed to confirm reliability and validity of the 50-item SS-R. Test–retest and internal consistency of the 50-item SS-R were good to excellent. Furthermore, validity of the 50-item SS-R was found to be excellent, as the forensic patients showed significantly lower SS-R scores (indicating higher levels of supernormality) than did the control participants. In agreement with earlier research (8) concerning the relationship between malingering and psychopathy, it was found that psychopathy was not related to faking good.

However, we also must acknowledge some limitations to the findings of these studies. First, the patient sample in study 2 was very small ($n = 32$) in comparison with the control group ($n = 118$). Second, there was little discrepancy between mean SS-R scores of the different groups, both in study 1 and 2. Although these scores differed significantly, their mean SS-R scores all varied from 56 to 67. To use the SS-R as a diagnostic tool in forensic psychiatry, one may want these scores to be more clearly divergent in different groups. We expect that these differences between the groups could be improved when the diagnoses of the forensic patients are taken into account. More specifically, we expect that supernormality would be more likely to be diagnosed among patients with personality disorders than among psychotic patients. However, the relationship between supernormality and psychopathy in study 2 is conflicting with this assumption. One explanation for this might be that the PPI does not really measure psychopathic traits, but antisocial behavior. Although the PPI correlated significantly with the PCL-R (19), it remains a self-report instrument. However, there may also be other factors influencing the relationship between supernormality and psychopathy, for instance, other psychiatric diagnoses (e.g., depression, substance abuse) or the intelligence of participants. For instance, research of Alliger et al. (20) showed that faking good scores were positively related to intelligence. As IQ was not measured in this study, there might be a discrepancy in intelligence levels among the participants.

Future directions for research into the concept of supernormality could be examining whether supernormal behavior is a normative response. It would therefore be interesting to explore whether in other real-life settings a group of supernormal individuals can be identified and compared to characteristics of those who malinger. In line with this, it would be informative to investigate whether those who fake good differ from those who fake bad on a broader personality spectrum than psychopathy only. Results of the study of Cima et al. (7) already suggest that faking as a strategy depends on both situation and personality style. However, it remains unclear which personality traits are exactly related to certain types of faking. Furthermore, psychiatric diagnosis and intelligence should be taken into account to reveal a more reliable judgment concerning the relationship between supernormality and psychopathy. However, psychopaths may be such a heterogenic group (21), that an association between simulation and psychopathy can simply not be established. Further research should clarify this issue. In addition, regarding the context, it would be interesting to investigate whether SS-R scores vary as a result of nearby parole evaluations.

One of the main directions for future research might be the relationship between certain brain areas and supernormality. As research on psychopathy and pathological lying has demonstrated to be related to specific brain areas (22–24), one would expect that specifically the frontal lobe is involved in choosing a strategy of faking good or bad. Given that the more impulsive offenders have lower frontal lobe brain activity (24), it seems likely that certain personality characteristics will be negatively related to faking behavior. Further research, using functional neuroimaging techniques or evoked related potentials, is needed to clarify the relationship between possible specific brain dysfunctions and supernormality.

In sum then, the current findings showed reasonably good evidence for the reliability and validity of the SS-R. Especially, the high diagnostic accuracy rates provide a basis for cautious optimism regarding the SS-R as a screening tool for supernormality. Research regarding the relationship between supernormality and psychopathy, as well as other psychiatric diagnoses, and certain brain areas need further investigation.

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