The facets of an impostor – development and validation of the impostor-profile (IPP31) for measuring impostor phenomenon

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Abstract

The Impostor Phenomenon (IP) is a characteristic, which is composed of cognitions of inauthenticity, in conjunction with fear of failure, as well as fear of being exposed as a fraud. The IP was first described by Clance (1985), who also developed an accompanying questionnaire. However, this questionnaire left room for optimization (item content, psychometric properties, and the representing IP as a multidimensional construct). Therefore, we developed an item pool of 450 new items based on the theoretical foundation. The core element characteristics are measured using the theoretically derived scales: *Competence Doubt*, *Working Style*, *Alienation*, *Other-Self Divergence*, *Frugality* and *Need for Sympathy*. Based on a German sample ($N = 771$, 51% female), aged 18 to 70 years, exploratory and confirmatory factor analysis resulted in a selection of 31 items. The six scales show satisfactory internal consistencies between .69 and .92. Initial construct validity showed positive correlations with convergent (*Neuroticism*) and discriminant measures (*Self-Esteem*). The Impostor-Profile (IPP31) is a theoretically founded multidimensional German questionnaire that can be applied in research and practice.

Keywords Big five · Clance impostor phenomenon scale · Impostor-profile · Impostor syndrome · Impostor phenomenon · IPP31

I feel like an impostor when we did that show in Portland. When I was about to get on stage and it was a [...] sold-out arena. I still feel like an impostor. This is so crazy, feels fake. It's just because I have a very high standard and I work really hard and I'm never satisfied. (The Joe Rogan Experience 2019)

The perceptions described by the comedian Joe Rogan are prototypical for the Impostor Phenomenon (IP). It is characterized by an experience of intellectual or occupational fraudulence (Matthews and Clance 1985) and was first described

by Clance and Imes (1978). The two psychotherapists and professors observed that many of their female clients, despite their qualifications, their awards, or their achievements, did not develop a self-referential sense of success (Clance and O'Toole 1988). Patients could not internalize their successes and felt as if they had illegally obtained their current position through either excessive effort or luck (Matthews and Clance 1985). In consequence, this self-image led to a fear of being exposed. The IP can be described as a dysfunctional personality style (Rohrmann et al. 2016) with negative effects in the working context as well as in private life. Due to the positive correlation of the IP with self-discipline and perceived competence (Bernard et al. 2002), high expressions in the IP has a negative influence on professional achievement and is considered as a performance inhibiting construct (Chae et al. 1995). Convergent validity was shown by the connection with instruments measuring psychological stress experience, higher depressive symptoms, higher self-monitoring and perfectionism (Henning et al. 1998; Thompson et al. 2000; Ferrari and Thompson 2006; Hutchins 2015; Rohrmann et al. 2016). The IP goes along with detrimental consequences such as greater inclinations to depression, lower mental health, and an increased experience of stress (Sakulku and Alexander 2011). Clance and Imes (1978) proposed the psychological construct under the term *Impostor Syndrome*. Even though

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this term is used in large parts by the scientific community, the authors explicitly pointed out, that the object of investigation is a personality characteristic without clinical implication.

Initially, results indicated that women were predominantly affected by the IP (Clance and Imes 1978). Further investigations revealed, however, that there were no gender differences regarding impostorism (Lester and Moderski 1995; Rohrmann et al. 2016; Leach et al. 2019).

Persons suffering from the IP tend to self-handicapping, fend off praise and have the feeling of stacking up, which leads to the fear of being exposed (Want and Kleitman 2006; Kumar and Jagacinski 2006). Similarities have been found between the depressive attributional style and the IP. Brauer and Wolf (2016) found a negative relation between the internal-stable-global attribution in positive situations and a reversed relation in negative situations. In addition, they found that this detrimental attributional pattern regarding performance was stronger related to the IP than to social situations. These results correspond to previous findings, which show that Impostors are more concerned about mistakes, overestimate the number of mistakes made, and are less satisfied with their performance (Thompson et al. 1998). Moreover, Impostors show lower organizational citizenship behavior and job satisfaction (Vergauwe et al. 2015). Leaders, in particular, are affected frequently by the IP. Rohrmann et al. (2016) found that more than half of the managers surveyed in their sample showed impostor inclinations. Additionally, heads of marketing departments (Fried-Buchalter 1997), people in the founding scene (Sightler and Wilson 2001), and medical specialists (Henning et al. 1998) showed signs of the IP. Furthermore, the IP is more prevalent when a person is starting a new position (Sanford et al. 2015; Parkman 2016). The presence of this phenomenon is not limited to western culture, but also affects persons of collectivist societies in Korea (Chae et al. 1995) as well as in Japan (Fujie 2010). The prevalence of people who have suffered from the feeling of being a fraud at some point in their career was found to be 70% (Gravois 2007; Badawy et al. 2017). So a differentiated and specific assessment of the phenomenon is, therefore, a relevant research and practical assessment concern.

Measurement of the Impostor Phenomenon

To measure the IP manifestation, usually, one of the four instruments is used. The first questionnaire was the *Harvey Impostor Phenomenon Scale* (HIPS; Harvey 1981) which contains 14 items and has an internal consistency of .70 (Hellman and Caselman 2004). Factor analytical investigations indicated a two-factor model (Edwards et al. 1987; Hellman and Caselman 2004). The *Perceived Fraudulence Scale* (PFS; Kolligian and Sternberg 1991) is a 51-item instrument measuring IP

and the reported correlation of the PFS and HIPS is .83. The PFS also correlates positive with the *Clance Impostor Phenomenon Scale* (CIPS; Clance 1985) and shows instable internal consistencies. The most recent developed instrument is the *Leary Impostor Scale* (LIS; Leary et al. 2000), which includes seven items and has a reported alpha of .87. The correlation of the Leary Impostor Scale with the existing instruments HIPS, PFS and CIPS range from .70 to .80 (Leary et al. 2000).

However, the most frequently used instrument for measuring Impostor tendencies in the general population is the CIPS (Clance 1985; Holmes et al. 1993; Mak et al. 2019). The instrument is economic with 20 items and allows the categorization of the Impostor score into a light, medium, and strong expression by forming a total score. The internal consistency is high across multiple studies ($\alpha = .84-.96$; Prince 1989; Holmes et al. 1993; see also Mak et al. 2019). The factor structure of the instrument was tested utilizing exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Chrisman et al. (1995) and Brauer and Wolf (2016) both found, that a 3-factor solution had the best model fit. The factors *Fake*, *Luck* and *Discount* could be extracted in both the English and German version of the CIPS (Brauer and Wolf 2016; Chrisman et al. 1995). However, using CFA, French et al. (2008) (French et al. 2008), as well as Fujie (2010), have identified a 2-factor model as the most fitting. Jöstl et al. (2012), as well as Simon and Choi (2018), found a unidimensional factor structure to be the most appropriate for the underlying structure.

Nevertheless, there are several caveats in using the CIPS. First, there are optimization possibilities due to the item formulation, which technically consists of several components. The items 5, 9 and 13 contain the quantifier “*sometimes*”, which can lead to confusion in combination with the central answer option “*sometimes*” from the 5-point Likert scale. Secondly, Mak et al. (2019) noted that the CIPS, PFS, and HIPS are based on the multidimensional construct of the IP, but do not measure subscale characteristics. Instead, they provide total scores that do not allow to differentiate between narrow aspects of the IP—despite evidence of the factor analytical investigation, which shows multidimensionality (e.g., Brauer and Wolf 2016; Chrisman et al. 1995) and, however, is not taken into account regarding the use of the questionnaire. Thirdly, the factor solutions proposed in previous studies show that (a) the item-factor assignment is highly imbalanced; for example, Brauer and Wolf (2016) showed that *Discount* and *Luck* consist of only four items and (b) that there are no differential relationships between the scales and external criteria (e.g., measures of self-esteem, fear of negative evaluation, or depressiveness). We argue that a measure to distinguish between the core characteristics of the IP is needed in research and practical applications (e.g., testing outcomes of intervention studies).

Aim of the Study

In line with recommendations to clarify the dimensionality of the IP (e.g., Mak et al. 2019), a current, validated measuring instrument for the IP, which maps different elements of the construct through subscales, would allow for a more differentiated assessment. This psychometric gain could lead to a more nuanced interpretation and intervention. This investigation aims to develop a questionnaire for the IP, which on the one hand assesses the core elements of the construct (Clance and O'Toole 1988) through theoretically appropriate items and to make different element-characteristics measurable utilizing subscales.

Item Construction and Preliminary Analysis

For item construction, theories and descriptions of the IP by Clance (1985), Clance and Imes (1978), Harvey and Katz (1985), as well as Sakulku and Alexander (2011) were analyzed. Emotions, cognitive patterns, and behavioral strategies were isolated and grouped into five categories: *Idealistic Ambition*, *Sorrow-System*, *Ingratiation*, *Belief in Incompetence* and *Inauthenticity*. For each, 90 items expressing core concepts were created by three experts, resulting in an initial item pool of 450 item candidates.

A Visual Analogue Scale (VAS; Kuhlmann et al. 2017) ranging from 0% (“does not apply in any aspect”) to 100% (“applies completely”) was selected as the response scale for the *Impostor-Profile*, as this allows a more nuanced setting specification and increases the information content (Reips and Funke 2008). In a pilot study, 162 items have been selected based on precision as well as simplicity and administered to a German sample of $N = 303$ (36.3% female) with an average age of 23.7 years ($SD = 5.8$). Then, these items were analyzed using factor analysis ($N = 303$, ordinary-least-squares extraction, Promax rotation, iteratively excluding items with main loadings $< |.40|$). A 7-factor solution was found, reducing the pool to 65 items. Before starting the validation process the seventh scale of the instrument was excluded after another round of experts concluded that the overall contribution of the scale is negligible (low explained variance (2.68%) and the scale containing three items with highly similar content.).

The objectives of this study were: (a) finding an adequate factor solution (item selection criteria: number of items per factor at least three, main loading $> .50$, a difference between main and secondary loading $> .20$) with a satisfying model fit ($GFI > .90$; $AGFI > .90$; $CFI > .90$; $RMSEA < .08$; Hu and Bentler 1999); (b) the construction of scales with sufficient reliability (internal consistency $> .70$) and to (c) examine construct validity by investigating the relationships between convergent and divergent instruments.

Method

Participants and Procedure

Participants were $N = 771$ (391 female; $M = 39.5$; $Md = 40.0$; $SD = 14.0$) between 18 and 70 years old persons from Germany who were partly generated by the commercial online survey panel “Consumerfieldwork GmbH” in the period from January to April 2019. Besides demographic data, the survey also asked about occupation and educational level. For cross-validation purpose, the total sample was randomly split into two subsamples ($n_1 = 300$, $n_2 = 471$). The gender ratio of the sample (51% female) was balanced, with the age distribution being left-handed, with a disproportionate frequency of persons being 18 to 23-year-olds. Within the occupational groups, pensioners and the unemployed in particular were underrepresented. Employees (58%) and soldiers (15%) were well represented. The sample holds a large proportion of people with a school-leaving certificate (27%) or vocational training (35%). The research data is archived and can be accessed under the Open Science Framework link osf.io/IPP31 (Table 1).

Measures

Besides the item pool of the Impostor-Profile (65 items), a selection of instruments measuring theoretically related constructs was administered. The *Big Five Inventory* (BFI; Rammstedt and Danner 2016) in the adaption according to Rammstedt (1997) measures the Big Five.

The questionnaire contains 45 items with a 5-point Likert scale (1 = “strongly disagree; 5 = “strongly agree”) to assess the five dimensions *Neuroticism*, *Extraversion*, *Openness to new Experiences*, *Conscientiousness*, and *Agreeableness* with a total of 10 facets. The internal consistency ranges from .78 to .83 (Rammstedt and Danner 2016). The construct validity was shown by the connection to the established personality instruments NEO-PI-R and NEO-FFI (Rammstedt and Danner 2016).

The *Clance Impostor Phenomenon Scale* (CIPS; Clance and O'Toole 1988) contains 20 items and the total score informs about the respondent's impostor tendencies. The instrument has a 5-point Likert scale (1 = “not at all true”; 5 = “very true”) and the GCIPS, which is the German translation of the questionnaire, shows good psychometrical properties and has an alpha of .88 (Brauer and Wolf 2016).

The *Rosenberg Self-Esteem Scale* (RSES; Rosenberg 1965) in the adaption of von Collani and Herzberg (2003) contains ten items with a 4-point Likert scale (1 = “not true at all”; 4 = “is entirely true”) and assesses the two primary factors *Self-Diminishing* and *Positive Self-Esteem*. The internal consistency is .84 (von Collani and Herzberg 2003).

Table 1 Sample description by age, occupation and educational level

	Male (%) 380 (49)	Female (%) 391 (51)	Sum %	
Age	18–23	92 (12)	73 (9)	21
	24–29	53 (7)	25 (3)	10
	30–35	24 (3)	52 (7)	10
	36–41	37 (5)	52 (7)	12
	42–47	38 (5)	53 (7)	12
	48–53	48 (6)	60 (8)	14
	54–59	60 (8)	53 (7)	15
	60–70	28 (4)	23 (3)	7
Occupation	Pupil	0 (0)	1 (<1)	<1
	Student	60 (8)	61 (8)	16
	Pensioner	0 (0)	1 (<1)	<1
	Unemployed	0 (0)	0 (0)	0
	Clerical worker	200 (26)	245 (32)	58
	Self-employed person	27 (4)	37 (5)	9
	Civil servant	14 (2)	9 (1)	3
	Teaching/ Research	3 (<1)	0 (0)	<1
Education level	Soldier	76 (10)	37 (5)	15
	No educational attainment	1 (<1)	0 (0)	<1
	Certificate of secondary Education	12 (2)	11 (1)	3
	Secondary school level I certificate	33 (4)	39 (5)	9
	School leaving examination	119 (15)	94 (12)	27
	Vocational education	122 (16)	149 (19)	35
	Master craftsmen/ Technician	14 (2)	11 (1)	3
	Bachelor, master or higher	79 (10)	87 (11)	21

The percentages have been rounded to whole numbers; the german sample was recruited in the period from January to April 2019

Results

Step 1: Exploratory Factor Analysis

Exploratory factor analysis (EFA) was performed using the R-package psych (Revelle and Revelle 2015) on Subsample 1 ($n_1 = 300$, excellent sampling adequacy, $KMO = 0.93$). Principal-axis extraction and Promax-rotation were used and items with a main loading $< |.50|$ or with a difference between main and second loading $< |.20|$ were dismissed. Parallel analysis (Horn 1965) suggested the extraction of seven factors; matching the result in the pre-test however, a six-factor solution proved to be stable. The final item selection comprises 31 items loading on six factors (six Eigenvalues > 1 , $[1.16–9.70]$; 56% explained variance), with adequate fit ($RMSR = .03$; $RMSEA = .058$, 90% CI $[.048–.062]$, Tucker-Lewis-Index = .908; $\chi^2_{300} = 560.92$, $p < .01$). Each factor consists of 3–11 items; absolute factor correlations ranged from $-.02$ to $.66$ ($M = .27$, $SD = .22$).

The Impostor-Profile

The result of the factor-analytical iterations was a questionnaire with a total of 31 items which formed six factors. The six extracted factors reflect core elements as well as concise characteristics of the IP. Table 2 shows the relevant psychometric properties of the items and their factor affiliation. The factors were *Competence Doubt*, *Working Style*, *Alienation*, *Other-Self Divergence*, *Frugality*, and *Need for Sympathy*. The internal consistency of the six scales indicated by the standardized Cronbach's alpha lay between .69 and .92. Due to the low number of items per IPP31 scale, McDonald's omega is used as a further reliability estimator (Ziegler et al. 2014). The total omega of the scales lie between $\omega_t = .94$ and $\omega_t = .72$.

The scale *Competence Doubts* (e.g., “*Despite former successes, I have strong fear of failure.*”; $\lambda = .83$; $\omega_t = .94$) measures a person's competence-related self-doubt, especially before a performance task. It also measures fear of failure and maladaptive perfectionism. The cause of this self-concept is the external attribution style of positive work results. Besides

Table 2 Descriptive statistics, internal consistencies, item-total correlations (r_{it}), and factor loadings

Item	<i>M</i> (<i>SD</i>)	α^a	r_{it}	λ	Skewness/ Kurtosis	Mdn	element ^b
Competence Doubt		0.92					
1	37.34 (30.6)	.91	.81	.83	.46 / -1.09	30	Fear of Failure Maladaptive Perfectionism Self-Doubt
2	35.23 (27.98)	.91	.78	.69	.52 / -.9	29	
3	48.4 (33.27)	.93	.54	.63	.07 / -1.38	49	
4	27.7 (28.16)	.91	.76	.63	.98 / -.24	17	
5	26.87 (26.26)	.92	.73	.69	.96 / -.18	17	
6 ^r	39.66 (30.69)	.93	.52	.73	.41 / -1.09	34	
7	30.31 (28.55)	.92	.67	.61	.83 / -.51	20	
8	31.87 (27.06)	.92	.70	.59	.69 / -.58	24	
9	39.33 (29.97)	.91	.77	.86	.32 / -1.15	35	
10	27.77 (27.13)	.92	.69	.69	.98 / -.10	18	
11	33.40 (28.55)	.92	.72	.54	.63 / -.74	25	
Working Style		.86					
12	35.8 (29.18)	.82	.77	.75	.50 / -.98	30	Impostor-Cycle Pro- / Precrastination
13	41.42 (29.84)	.82	.80	.86	.23 / -1.18	40	
14 ^r	58.9 (29.08)	.88	.40	.51	.29 / -1.07	60	
15	36.34 (30.95)	.82	.75	.78	.50 / -1.04	29	
16	40.91 (29.12)	.83	.70	.71	.33 / -1.05	38	
17 ^r	38.04 (27.78)	.86	.54	.56	.48 / -.85	34	
Alienation		.85					
18	22.58 (22.13)	.79	.91	.81	1.13 / .58	15	Impression-Management
19	31.73 (27.16)	.82	.74	.82	.66 / -.63	25	
20	26.07 (25.73)	.77	.84	.70	1.02 / .07	17	
Other-Self Divergence		.79					
21	30.45 (22.87)	.74	.67	.54	.76 / .07	26	Denial of Competence
22	26.14 (22.51)	.77	.52	.78	.90 / .18	21	
23	24.08 (21.85)	.68	.99	.91	1.13 / .68	17	
24	32.50 (25.28)	.77	.66	.64	.59 / -.49	29	
Frugality		.71					
25 ^r	49.70 (28.54)	.62	.55	.65	.51 / -.79	50	Fear and Guilt about Success
26 ^r	64.92 (27.92)	.64	.51	.45	.05 / -.96	70	
27 ^r	52.05 (25.67)	.62	.57	.58	.08 / -.71	51	
28	40.64 (34.89)	.73	.40	.45	.40 / -1.32	31	
Need for Sympathy		.68					
29	60.25 (26.92)	.40	.62	.76	.43 / .6	62	Superwoman/ -man Aspects
30	54.84 (25.77)	.46	.59	.68	.29 / .6	56	
31	72.51 (21.26)	.79	.31	.53	.85 / .46	77	

The median value is shown in italics and the standard deviation in brackets; ^a Standardized Cronbach's alpha; total values for subscales; corrected values when the item is dropped for each item; ^b underlying theoretical assumptions for the items in accordance with Sakulku and Alexander 2011; we used the german version of the IPP31

the negative consequences for subjective well-being, such as anxiety and depression, a high degree in this factor also indicates a reduced professional ambition. *Working Style* (e.g., “Often I postpone starting important tasks.”; $\lambda = .86$; $\omega_t = .89$) is defined as a scale that measures the extent to which a person is prone to procrastination. A high score in *Working*

Style indicates procrastination tendencies, while a low score indicates precrastination tendencies. Both working styles are regarded as different compensation attempts concerning the fear of failure due to a performance task. In both cases, the positive work result is attributed externally to the overly early work start or the last possible excessive workload. Both

working styles are typical for impostorism but can be differentiated by scale expression. The scale *Alienation* (e.g., “*I often feel like I hold back my real personality.*”; $\lambda = .82$; $\omega_t = .86$) is specified as a scale which describes the missing feeling of authenticity and the high expression of impression management. High expression in this factor is due to the feeling of not being sufficient, so tendencies of self-control also reach into private life. *Other-Self Divergence* (e.g., “*People overestimate me.*”; $\lambda = .93$; $\omega_t = .82$) measures the extent to which the expectations of the environment are perceived as overstraining. The cause of this perceptual distortion is a large delta between the low self-efficacy expectation and the successful work perceived by others. The large difference between self- and other image intensifies the pressure to adapt as well as the feeling of not being adequate. The fifth scale *Frugality* (e.g., “*It is very important to me to create something significant*”; $\lambda = -.65$; $\omega_t = .82$) describes the person’s tendency to low self-expectations and unwillingness to lead. The fear of responsibility and challenges results from the fear of being exposed as an impostor. This reluctance inhibits career advancement and personal development. *Need for Sympathy* (e.g., “*I think it is important to appear sympathetic.*”; $\lambda = .76$; $\omega_t = .72$) measures the need for popularity and goodwill on the part of others. A high level on this scale indicates that the person believes in being dependent on the goodwill of others. Too much tolerance, however, has professional disadvantages and also serves as an external object of success attribution.

Confirmatory Factor Analysis

The 6-factor model was validated using the data of Sample 2 ($n_2 = 471$) through confirmatory factor analysis (CFA); calculations were performed using the R-package lavaan (Rosseel et al. 2017). Robust maximum-likelihood (MLR) estimation was used as recommended by Rhemtulla et al. (2012). As expected, the χ^2 -test was statistically significant ($\chi^2_{419} = 1040.3$, $p < .001$). The inspection of goodness-of-fit indicated good model-data fit (GFI = .852; AGFI = .825; RMSEA = .063, 90% CI [.056–.065]; CFI = .910). The loadings were high for each factor ($\geq .40$; see Table 2).

Psychometric Properties

Next, we examined the item- and scale properties of the IPP31 (Table 2). The item difficulties showed a balanced pattern ranging between $M_{\min} = 22.6$ and $M_{\max} = 72.5$ across the scales with standard deviations between 21.3 and 34.9. The corrected item-total correlation was satisfying and indicated to discriminate well ($.31 \leq r_{it} \leq .99$). The analysis of skewness and kurtosis indicated no deviations from normality. We tested the reliability by internal consistency analysis and found good alpha coefficients for all scales ($\alpha \geq .79$) except for *Frugality* ($\alpha = .71$) and *Need for*

Sympathy ($\alpha = .68$) considering the low number of items per scale and the items’ good discrimination power, we decided to retain the scales. In addition, the reliability estimator McDonald’s omega, which is more suitable for scales with a small number of items (Revelle and Zinbarg 2009), shows sufficient reliability $\omega_t = .94$ and $\omega_t = .72$. The intercorrelation of the scales ranged from $r = -.20$ to $r = .65$ (Table 3). In particular, the *Competence Doubt* scale correlates positive with *Alienation* ($r = .61$) and *Other-Self Divergence* ($r = .65$). The scale *Frugality* shows the highest association with the scale *Other-Self Divergence* ($r = .05$).

Nomological Validity

To study the nomological validity, we examined the relationships between the IPP31 scales and positive associated (CIPS; *Neuroticism*) as well as negative associated (*Conscientiousness*, *Extraversion*, *Self-Esteem*) traits. We used the total sample of $N = 771$ persons to investigate the validity correlations. To check the measuring intention of the IPP31 the anticipated relation was: H2a) a positive correlation between the scale *Competence Doubt* and the CIPS.

The existing research results on CIPS and the Big 5 dimensions (Bernard et al. 2002; Chae et al. 1995; Ross et al. 2001; Vergauwe et al. 2015) led to the following hypotheses that: H2b) *Neuroticism* shows a positive correlation with the *Competence Doubt* scale; H2c) *Extraversion* shows a negative correlation with *Competence Doubt*, a negative correlation with *Alienation* and a negative correlation with *Other-Self Divergence*; H2d) *Conscientiousness* has a negative correlation with *Working Style*; H2e) *Openness* has no connection to *Competence Doubt*; H2f) *Agreeableness* shows a positive connection to *Competence Doubt* and shows a positive correlation with *Frugality* and *Need for Sympathy*. The research results of Schubert and Bowker (2017), who found a negative correlation between self-esteem and CIPS, led to the hypothesis that H2g) *Self-Esteem* shows a negative correlation with *Competence Doubt*, *Alienation*, and *Other-Self Divergence*.

The BFI showed the expected correlations with the scales of the IPP31 (Table 3). *Neuroticism* showed robust correlations with *Competence Doubt* ($r = .68$) so that the assumption H2b) can be accepted. Besides *Neuroticism* showed a significant correlation with *Working Style* ($r = .25$), *Other-Self Divergence* ($r = .38$) and *Alienation* ($r = .46$). The scale *Extraversion* showed negative correlations, especially with the scale *Alienation* ($r = -.49$), *Other-Self Divergence* ($r = -.25$) and *Competence Doubt* ($r = -.39$). The anticipated correlation between *Extraversion* and *Competence Doubt* could be found, so H2c) can be verified. *Conscientiousness* showed a negative correlations with *Working Style* ($r = -.71$) and leads to the acceptance of H2d). Moreover *Conscientiousness* showed a negative correlation with *Competence Doubt* ($r =$

Table 3 Correlations of the IPP31 subscales and the Big-Five Inventory (BFI), Clance Impostor Phenomenon Scale (CIPS), and Rosenberg Self-esteem Scale (RSES)

	Subscale (α)	IPP31 ^a					
		CD	WS	A	O-S D	F	NfS
IPP31	CD	1	.38	.61	.65	−.04	.26
	WS		1	.32	.31	−.04	.07
	A			1	.52	−.03	.16
	O-S D				1	−.05	.21
	F					1	−.20
	NfS						1
BFI	Neuroticism (.72)	.68	.25	.46	.38	.14	.11
	Anxiety (.74)	.65	.22	.38	.36	.18	.16
	Depression (.70)	.58	.25	.48	.36	.06	.04
	Extraversion (.93)	−.39	−.17	−.49	−.25	−.32	.08
	Assertiveness (.91)	−.37	−.12	−.39	−.23	−.27	.02
	Activity (.77)	−.34	−.29	−.33	−.25	−.37	.15
	Openness (.81)	−.11	−.04	−.09	−.16	−.26	.15
	Openness for aesthetics (.82)	−.03	.03	−.04	−.10	−.12	.12
	Openness for ideas (.69)	−.11	−.07	−.07	−.13	−.28	.14
	Conscientiousness (.88)	−.37	−.71	−.29	−.33	−.05	.04
	Orderliness (.83)	−.30	−.56	−.24	−.24	< .01	−.04
	Self-discipline (.83)	−.38	−.70	−.28	−.33	−.08	.04
	Agreeableness (.74)	−.04	.05	−.05	−.02	−.21	.21
	Altruism (.71)	.04	.04	−.07	.02	−.15	.30
	Conformity (.70)	−.09	−.05	−.08	−.07	−.17	.10
CIPS	CIPS-Score	.80	.38	.54	.59	−.04	.19
	Luck (.69)	.51	.26	.36	.44	.01	.09
	Fake (.84)	.79	.33	.50	.52	−.07	.18
	Discount (.73)	.63	.22	.43	.46	.06	.13
RSES	Global self-worth (.83)	−.74	−.30	−.53	−.48	−.08	−.07
	Positive self-worth self-satisfaction (.93)	−.43	−.17	−.30	−.32	−.12	.07
	Positive self-worth self-efficacy (.77)	−.57	−.23	−.44	−.34	−.08	−.04
	Negative self-worth (.83)	.70	.30	.49	.45	.03	.11

^a Abbreviated IPP31 dimensions: (CD) *Competence Doubt*, (WS) *Working Style*, (A) *Alienation*, (O-S D) *Other-Self Divergence*, (F) *Frugality* and (NfS) *Need for Sympathy*; correlations greater |.25| are highlighted in boldface; | r | > .07/.10/.13 are related to p < .05/.01/.001

−.37), *Other-Self Divergence* ($r = -.33$) and *Alienation* ($r = -.29$). The BFI scale *Openness* showed as expected no correlation to *Competence Doubt* (H2e). Interestingly *Openness* has a negative association with *Frugality* ($r = -.26$). The hypothesized positive correlation of *Agreeableness* with *Competence Doubt* ($r = -.04$) and also the anticipated positive correlation of *Agreeableness* to *Frugality* ($r = -.21$) has to be rejected (H2f). The last presumed negative correlation between *Self-Esteem* and the IPP31 scale *Competence Doubt* (H2g)) could be accepted ($r = -.74$).

Analyses of Age and Gender

The investigation of the relationships between age and the IPP31 scales shows that age represents a predictor for IP

tendencies. Significant correlations between age and *Competence Doubt* ($r = -.21$), *Working-Style* ($r = -.28$), *Other-Self Divergence* ($r = -.14$) and *Frugality* ($r = .38$) could be found. In addition, a significant positive link between the female gender and the IPP scales *Competence Doubt* ($r = .22$), *frugality* ($r = .14$) and *Need for Sympathy* ($r = .18$) could be found. The CIPS-Score also shows a significant positive association with the female gender ($r = .16$).

Discussion

This study introduced the IPP31 and described the construction and validation of a current multidimensional instrument for the assessment of the IP. A print version,

as well as a link to an interactive online version of the questionnaire, can be found in the online Ressource 1. The theoretical basis for item generation was derived from the basic work of Clance (1985), Clance and Imes (1978), Harvey and Katz (1985), as well as Sakulku and Alexander (2011). After the definition of psychometric criteria and the exclusion of insufficient items, a questionnaire with 31 items containing six factors *Competence Doubt*, *Working Style*, *Alienation*, *Other-Self Divergence*, *Frugality* and *Need for Sympathy* resulted. The predefined model requirements were validated by confirmatory factor analysis. The indicator of internal consistency shows satisfactory reliability.

The investigation of the relationships between age and the IPP31 scales shows that age represents an important predictor for IP tendencies, except for the scale *Frugality*, which is positively related. Significant correlations between age and *Competence Doubt* ($r = -.21$), *Working-Style* ($r = -.283$), *Other-Self Divergence* ($r = -.13$), *Frugality* ($r = .38$) were found.

The psychometric properties of the questionnaire are sufficient, especially by considering McDonald's omega, which seems to be a more informative indicator regarding the low number of items. The goodness-of-fit indicators verify the quality of the questionnaire as sufficient.

The correlations of the IPP31 with other instruments might be an indicator for discriminatory validity. The total CIPS score, which is considered the most popular indicator for investigating the IP, showed a high correlation with the *Competence Doubt* scale. Also, *Alienation* and *Other-Self Divergence* showed high correlations with the total CIPS value. These correlations verify the construct validity of the IPP31. Interestingly, the total CIPS value, as well as the subscales *Fake*, *Luck* and *Discount* according to Brauer and Wolf (2016), showed no relation to the IPP31 scales *Frugality* and *Need for Sympathy*. This could be an indicator of a lack of construct-relatedness concerning these two IPP31 scales or the missing relation is an indicator of the CIPS deficits concerning the diagnostic representation of theoretical aspects.

Also, the strong association between *Neuroticism* and the IP (Bernard et al. 2002; Vergauwe et al. 2015) is shown by the correlation of *Neuroticism* with the scale *Competence Doubt*. In particular, the strong correlation between *Competence Doubt* and *Depression* signifies the convergent validity of the scale as well as the negative subjective quality of high Impostor tendencies. Interestingly, there is a medium-strong correlation between *Neuroticism* and *Working Style*. This is an indicator that people with greater tendencies to anxiety and depression also tend to procrastinate. The connections between Conscientiousness and *Working Style* as well as *Competence Doubt* verify the validity of the IPP31.

Besides, the *Working Style* scale allows individual assessment of the procrastination or precrastination tendency. Both working styles are typical for the IP but can be differentiated by scale values. As expected, *Openness* shows no connection to the *Competence Doubt* scale. The only scale of the IPP31 that shows a weak negative correlation to openness is *Frugality*. This correlation, however, seems to make sense since *Openness* is also called “intellect” (Digman 1990) and *Frugality* questions a careerist passivity. Research results on the relationship between CIPS and *Extraversion* (Chae et al. 1995; Ross et al. 2001) showed a weakly negative correlation. However, the scales *Competence Doubt* and *Alienation* show a medium negative correlation with *Extraversion*. This indicates that *Competence Doubt* does not fully correspond to the CIPS value. The high correlation to the scale *Alienation* and *Competence Doubt* in combination with the low correlation to *Working Style* and *Need for Sympathy* could be an indicator for the same measurement intention but at the same time higher differentiation between the IP elements by the IPP31.

The low correlations of the scales *Frugality* and *Need for Sympathy* with the dimension *Agreeableness* could be an indication that *Agreeableness* as a characteristic is not to be equated with the desire for subpersonal relationships. The facet *Altruism* of the scale *Agreeableness* showed the expected overlap with *Need for Sympathy* (9% shared variance), demonstrating the content validity of the scale.

The global *Self-Esteem* (RSES) showed strong negative correlations with the four scales *Competence Doubt*, *Working Style*, *Alienation* and *Other-Self Divergence* and supports the convergent validity of the IPP31 scales.

Our findings support the hypotheses, except for the expected positive association between *Frugality* and *Agreeableness*. The link between *Agreeableness* and *Frugality* (H2f) was not as expected positive. Overall, the nomological validity of the IPP31 was largely supported.

Limitations

One point of criticism is the sample, which shows the biggest age segment in a range of 18 to 23 years and shows a right-skewed distribution. Especially considering that age is an important predictor of IP trends, as can be seen from the significant relationships to the four IPP31 scales. However, the age groups are sufficiently taken into account when both genders are considered together so that the results can be generalized for the German population. It should also be noted that the survey method was online-based so that the survey conditions could not be controlled, reducing the objectivity of execution. Also, the facet of perfectionism, which has a high weighting in the theoretical construct, was not assigned its scale within the

questionnaire. The low eigenvalue of the scale *Need for Sympathy* [1.16] could also be an indicator of the low significance of the scale and should be evaluated concerning its practical relevance.

Perspectives

The construct validity of the Impostor-Profile could be supported by correlations with other constructs within the nomological network especially by strong correlations to the CIPS. In particular, the scale *Competence Doubt* shows substantial overlap with the CIPS. Interestingly, the scales *Frugality* and *Need for Sympathy* show no connections to CIPS. However, due to the proximity of the scales in terms of construct content described in the original literature (Table 4), they have a diagnostic value in the examination of Impostor tendencies. Given the lack of relationships with CIPS, these two scales, in particular, could provide incremental information gain. Another future research concern should be the construct validity, which must be checked in future studies using the HIPS, PFS, and LIS as well as further personality constructs. Moreover, future studies should examine criterion validity to check the practical relevance of the questionnaire.

Another possible step could be the factor-analytical extraction of a second-order factor. The factor loadings to the primary factors could serve as a weight, allowing the individual scale values to be weighted and added up to an Impostor-Profile total score. This score could be compared in further investigations with the total scores of HIPS, PFS, CIPS and LIS. Besides, a future research concern could be the determination of IPP31 cut-off equivalents to CIPS using ROC analysis (Receiver-Operating-Characteristics). This would allow measuring Impostor expressions according to the categorization of CIPS with the IPP31. The multidimensionality of the questionnaire would also make it possible to explore the

presence of different types of Impostors by using cluster analysis and to check the theoretically formulated typology according to Harvey and Katz (1985).

This has so far been difficult due to the unidimensional instruments regarding IP. An impostor typology would, on the one hand, open up new research questions, and on the other hand, enable a type-appropriate development of interventions. Leonhardt et al. (2017) had identified a possible typological structure for the impostor phenomenon. Two types resulted, *true impostors*, which show negative self-perceptions and *strategic impostors*, which show a less negative attribution style. This typology could be validated by a cluster-analytical investigation of the IPP31 characteristics.

Furthermore, it would be useful to investigate the validity and factor structure for the English translation of the IPP31.

In conclusion, the resulting multidimensional questionnaire is psychometrically sufficient and theoretically based. Due to its profile character, the IPP31 can raise further research approaches regarding an impostor typology or help to clarify the construct's dimensionality. Besides, the questionnaire can gain practical relevance in coaching and therapeutic context. The multidimensionality enables higher resolved diagnostics and in consequence a more targeted intervention.

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Compliance with Ethical Standards

Ethical Standards On behalf of all authors, the corresponding author states that there is no conflict of interest. The investigation has met the ethical standards for psychological investigations. No subject was negatively affected by participation.

Appendix

Table 4 Items of the IPP31 in the original German Version and an Tentative English Translation

Deutsch	English
Kompetenz-Zweifel	Competence Doubt
1 Trotz vergangener Erfolge habe ich starke Versagensängste	Despite former successes, I have strong fear of failure
2 Ich denke häufig, dass meine Fähigkeiten nicht ausreichen	I often think that my skills are not enough
3 Prüfungssituationen sind für mich sehr belastend	Exam situations are very stressful for me
4 Aus Angst zu versagen, verliere ich öfter den Spaß an der Arbeit	My fear of failure often spoils the fun at work
5 Ich bin von meinen Fähigkeiten nicht überzeugt	I am not convinced of my capabilities
6 ^r Ein Misserfolg ist kein Grund für mich, an meinen Fähigkeiten zu zweifeln	Failure is no reason for me to doubt my capabilities
7 Ich bin meistens unzufrieden mit meinen Arbeitsleistungen	I am usually unsatisfied with my work
8 Sehr gute Resultate Anderer verunsichern mich	When others get good results, it makes me insecure
9 Ich habe Angst zu scheitern, obwohl ich meistens erfolgreich bin	I'm afraid to fail, even though I'm usually successful
10 Wenn ich erfolgreich bin, habe ich häufig das Gefühl, dass ein Misserfolg folgen wird	When I am successful, I often feel that a failure will follow
11 Mich belasten die hohen Erwartungen Anderer an mich	High expectations of others bother me

Table 4 (continued)

Deutsch	English
Arbeitsstil	Working Style
12 Ich erschwere mir vieles, weil ich meine Arbeit aufschiebe	I make things difficult because I postpone my work
13 Oft verschiebe ich das Beginnen wichtiger Aufgaben	Often I postpone starting important tasks
14 ^r Ich fange meine Aufgaben früher an als Andere	I start my duties earlier than others
15 Ich beende wichtige Aufgaben meistens im letzten Moment	I usually finish important tasks at the last moment
16 Ich lenke mich häufig ab, auch wenn ich viel zu erledigen habe	I often distract myself, even though I have a lot to do
17 ^r Ich erledige die wichtigste Aufgabe meistens als erstes	I usually do the most important task first
Entfremdung	Alienation
18 Oft verhalte ich mich unecht	Often I behave little authentic.
19 Ich fühle mich oft so, als halte ich meine wirkliche Persönlichkeit zurück	I often feel like I hold back my real personality
20 Wirklich ich selbst bin ich nur selten	Actually, I am seldom myself
Fremd-Selbst Divergenz	Other-Self Divergence
21 Meine Fähigkeiten werden häufig überschätzt	My skills are often overrated
22 Die Erwartungen meiner Kollegen an mich sind zu hoch	My colleagues' expectations of me are too high
23 Man überschätzt mich	People overestimate me
24 Ich werde häufig für klüger gehalten, als ich bin	I am often considered smarter than I am
Genügsamkeit	Frugality
25 ^r Mir ist es sehr wichtig etwas Bedeutendes zu schaffen	It is very important to me to create something significant
26 ^r Eine Arbeit, bei der ich viele Untergebene hätte, würde mich befriedigen	A job where I have many subordinates would satisfy me
27 ^r Bedeutendes zu leisten ist mir im Leben am wichtigsten	Making a significant difference is what matters most to me in life
28 Ich wäre ungern Chef	I would not like to be boss
Sympathiebedürfnis	Need for Sympathy
29 Mir ist es wichtig sympathisch zu erscheinen	I think it is important to appear sympathetic
30 Mir ist es wichtig gemocht zu werden	It is important to me to be liked
31 Ich gelte als sehr hilfsbereite Person	I am considered a very helpful person

Original questionnaire in German; Translation without psychometric analysis; r reversed item; a print version as well as a link to an interactive online version of the questionnaire can be found in the online Resource 1

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