

MEASURING THE IMPOSTOR PHENOMENON

The Construction and Validation of the Impostor-Profile: An  
Instrument for the Multidimensional Measurement of the Impostor  
Phenomenon

DISSERTATION

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Hamburg, 30. Juni 2022



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### Abstract

Self-worth, the subjective value one ascribes to oneself as a person, is a central driving force of human action. The need for high self-esteem is axiomatic, and congruence between one's attitude towards oneself and one's actual abilities is a prerequisite for effectively coping with reality. However, despite amassing objective indicators of success, people often underestimate their abilities and achievements, which then stand in stark contrast to external performance expectations, which correspond to the actual successes achieved. This divergence between one's own and social performance expectations by others can potentially lead to the feeling of being an Impostor. The impostor phenomenon describes the chronic feeling that one's achievements and successes are fake, no matter how many indicators of success have been amassed, as well as the fear of being exposed to social judgement. Growing scholarly interest in this phenomenon has led to increased research and new psychometric instruments to measure the interindividual characteristics of those affected. Common to all these instruments is measurement of an overall, expression despite the multidimensional conceptualization of the construct. In this dissertation project, we addressed this mismatch between the theoretical construct and psychometric operationalization by developing a multidimensional questionnaire for measuring the impostor phenomenon on a facet level. In our preliminary article, we developed and validated the six-scale Impostor-Profile. In a subsequent study, the first study of this dissertation project, we detected an Imposter-Profile total score by aggregating the six subscales. Further, we found that gender differences in Impostor expression are particularly evident at the subscale level. In the second study, in an experimental design we showed that high Impostor expression is related to external-unstable success attribution and internal-stable failure attribution. In the third and final study, we validated the English version of the Imposter-Profile and formulated and explored an explanatory model for the emergence and manifestation of Impostor feelings, which we termed the LHMIP. Our research thus focuses on expanding diagnostic possibilities in Impostor research, experimentally validating imposters' non-self-

serving attribution style, and contributing new impulses to etiological research through the exploratory model.

### Acknowledgements

The seed of this dissertation project was planted five years ago, as I first became interested in the impostor phenomenon in my bachelor's thesis. But interest alone is not enough. The most important thing is for initial interest to meet fertile ground in terms of encouragement, support, and expertise. For me, this ground was and remains Professor Herzberg, his professorship, and, of course, his team.

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## Introduction

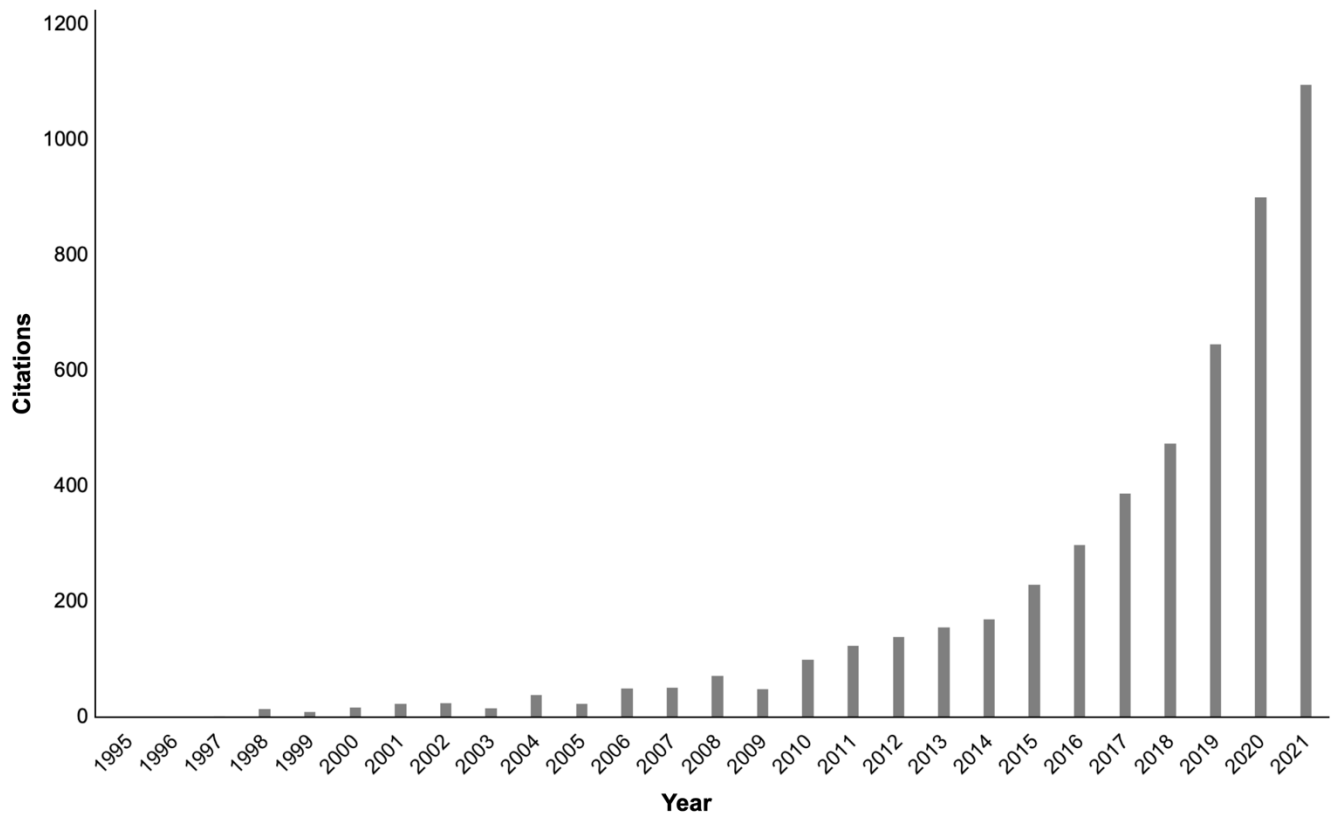
"Perfection is impossible without humility. Why should I strive for perfection, if I am already good enough?" (Leo Tolstoy)

However, what happens when the feeling of not being enough leads to overcompensation out of a desire to be flawless? What does it mean when self-doubt and the perceived expectations of others diverge to such an extent that the affected persons feel like pretenders?

The impostor phenomenon (IP) describes the constant feeling that one's achievements and successes are not deserved, no matter how much one has achieved so far. Affected people cannot internalize their successes and exhibit major self-doubts despite success. Feeling the need to represent something in the public eye that does not feel like one's true self is a long-known phenomenon. Even Einstein wrote, "The exaggerated appreciation of my life's work worries me. I feel compelled to regard myself as an involuntary impostor" (Einstein, 1955; quoted in Rohrmann, 2018, p. 14). This feeling of fraudulence is currently gaining increased scholarly and media attention, and recent social and technological developments may be leading to a higher prevalence of these impostor feelings. However, which specific current developments might have enhanced this bias in self-image? Expanding access to education in Western countries has led to more students graduating from school with university or technical college entrance qualifications. In 2006 in Germany, the proportion of people in the 20-25 age group with a university entrance qualification was 37.4%. In 2017, the proportion was 53.3% among 20-24-year-olds (Geis-Thöne, 2019). The share of students completing their A-levels with a grade of 1.4 or better also doubled, rising from 1.7% in 2006 to 3.3% in 2017 in the population of German high school graduates (Geis-Thöne, 2019). Due to the limited number of spots available at universities, the pressure on students to achieve excellent results has increased, especially for popular fields of study such as medicine and psychology. This pressure is also evident in the accumulating mental health problems among young people, such as depression and anxiety, in many Western countries (Collishaw, 2015).

Grade inflation and resulting ceiling effects have further increased the pressure on students to achieve flawless results. As one mistake can mean losing one's chance at a coveted university spot, it's no wonder that many students experience feel of failure. This also explains why more secondary school and university students are turning to performance-enhancing drugs such as modafinil (Vigil®), methylphenidate (Ritalin®), or anxiolytics like beta-blockers (Sharif et al., 2021). In addition to pressures in the educational system, demands in workplaces also seem to have risen. Today's organizations are often characterized as high-performance workplaces (Appelbaum, 2002) or functionally flexible workplaces (Kallenberg, 2003), which participative decision-making but also have extensive skill requirements. The rise of Industry 4.0 (e.g, intelligent and digitally networked systems for self-organised production) will lead to a further increase in high-skill activities, planning, and IT-related tasks, in particular. Overall, the complexity of work profiles will advance, and cross-functional and cross-organizational networking will become necessary (Bonekamp & Sure, 2015). New forms of work such as new work and agile work have led to expectations of faster results via customer-centered feedback cycles, while placing higher demands on employees' autonomy and ambiguity tolerance (Aghina et al., 2019). Overall, the complexity and performance demands within the modern workplace are changing, conceivably leading to increased fear of failure and the need to maintain a façade of success. Social media further reinforces the need to maintain a successful public persona. Career platforms such as LinkedIn serve as a digital business card and are essential for career-minded individuals to present their achievements. However, since almost exclusively successes are communicated on such platforms, regularly reading others' profiles and posts can lead to lower self-esteem, especially if one compares oneself with others (Krause et al., 2021). A discrepancy between one's digital persona and actual self is another factor that could conceivably reinforce impostor feelings. The growing interest in the IP is reflected in the volume of popular science articles on the phenomenon. Bravata et al. (2020) report that in one year (March 2018 to March 2019), a total of 2317 non-peer-reviewed internet articles on this topic were published. Articles in Psychology Today, Medium.com, and

Forbes.com received the most attention. The IP seems to reflect the zeitgeist, and many people can identify with the phenomenon. Consequently, research is also paying increasing attention to the IP. Over 1200 studies on the IP have been published since 1978, over 80% of which in the last 20 years (Mak et al., 2019). Also the number of citations is constantly increasing until today (fig. 1).



*Figure 1.* The number of citations according to the impostor phenomenon per year.

Due to the increasing scholarly and societal interest in the phenomenon, a core research effort should be measuring the IP as reliably and validly as possible, as diagnostics serve as an essential foundation for further research insights. In their systematic review, Mak et al. (2019) examined the instruments used to measure the IP and identified an overarching deficiency in the existing instruments. The IP is a multidimensional construct, but is represented in existing instruments as a total score. Mak et al. (2019) summarise in their outlook:

There remains to be questions about the dimensionality of the impostor phenomenon and its operationalization in measures [...]. Despite being based on multidimensional definitions of the construct, these measures calculate overall total scores and do not define subscale scores. Scoring of these measures appears to contradict the theoretical conceptualization of the impostor phenomenon. Without robust and consistent validation results and conceptual clarity, it is currently premature to select a 'gold standard' measure within the context of an evidence base that is still growing.

This dissertation project aims to address this conceptual gap and construct, optimize, and validate a multidimensional instrument for measuring the IP. This instrument should enable the construct-true, differentiated measurement of the IP in research and practice. Practitioners can use a multidimensional instrument for more specific interventions through differentiated diagnostics, and the validation of the results can contribute to conceptual clarity within research.

## **Overview**

First, I present the impostor phenomenon's origins and explain the construct's facets. In addition, I describe existing research on the IP's etiology and its nomological network. I then discuss the advantages and disadvantages and the psychometric properties of existing instruments for measuring the IP.

Following the discussion of current research, I present the core of the dissertation project, which consists of the preliminary research on the construction and validation of the Impostor-Profile and the three follow-up studies. The preliminary research deals with item construction and exploratory and confirmatory factor analysis to generate the initial version of the Imposter-Profile (IPP; Ibrahim et al., 2020). Subsequently, in the first article of this dissertation project, we investigated whether the IPP forms a general factor and how impostor expression differs by gender. In addition, we examined the

construct validity of the IPP total score and subscales (Ibrahim et al., 2021). In the second study, we examined the moderating effect of IP expression (IPP total score) on the relationship between success or failure and attributional style in an experimental design using a bogus intelligence test. Further, we examined the relationship between mindset and the IP. Finally, in the third article, we validated the English version of the IPP. In addition, we formulated an exploratory pathway model, the learned helplessness model of the impostor phenomenon (LHMIP), which explains the emergence of the IP by linking theoretically related constructs. Finally, the research results are summarised and embedded in the existing research context. In addition, I illustrate the limitations and implications of our findings and discuss future research questions.

### **The Origin of the Impostor Phenomenon**

Pauline Rose Clance and Suzanne Imes (1978) were the first to describe the impostor phenomenon. In addition to their university activities, the two professors supervised students and international groups in therapeutic and counseling sessions. In their sessions, they noticed a pattern of many women exhibiting intense self-doubts despite objective indicators of success, such as awards, prestige among colleagues, and titles. Clance and Imes systematically studied this phenomenon in 1974 as part of their practical counseling activities (Clance, 1985, p. 13). These exploratory case analyses with a sample of over 150 high-achieving women resulted in the first definition of the impostor phenomenon. The term "impostor" was used because those affected feel overestimated and believe they are projecting an exaggerated external image. They feel that their successes are undeserved and are subsequently afraid of being exposed (Sakulku & Alexander, 2011). Clance describes the phenomenon as an "internal experience of intellectual phoniness" (Clance & O'Toole, 1987). This discrepancy between external indicators of success and subjective feelings of incompetence is due to the insufficient internalization of success, because Impostors attribute their success externally, more "to error, luck, charm, or sensitivity than to ability" (Clance et al., 1995). The discrepancy between perceptions of external praise (Clance et al.,



1995) and a depreciated self-image that emphasizes one's weaknesses leads to the feeling that one is a fraud. The metaphor of wearing a mask illustrates the discrepancy between affected persons' psychological inner life and the façade projected to the outside world. Therefore, imposters are constantly worried about subsequent performance tasks and fear being exposed as Impostors (Harvey & Katz, 1985).

Clance and Imes (1978) deliberately chose the term "impostor phenomenon" because it is not "a pathological disease that is inherently self-damaging or self-destructive" (Clance, 1985, p. 23).

Nevertheless, the term "impostor syndrome" is often used synonymously in the literature, although the construct is not a clinical diagnosis (Rohrman, 2019, p. 11). Ross and Krukowski showed that the IP intersects with DSM VI Cluster C avoidant and dependent and described the IP as a maladaptive personality style characterized by a sense of inferiority, fear, and self-deprecation. Non-pathological personality styles cause strong behavioral tendencies but only become pathological in extreme manifestations (Rohrman, 2019, p. 12). Definitional criteria for Impostors are perceived fraudulence (Kolligian & Sternberg, 1991), external attribution of success, and internal attribution of failure (Clance & Imes, 1978), as well as the fear of being exposed as a fraud. Clance (1985) described six facets of the IP in her foundational work, making the construct accessible from a diagnostic perspective.

### **The Six Elements of the Impostor Phenomenon**

Clance (1985) formulated in her foundational work on the IP six elements that define the construct. As diagnostic criterion, she stipulated that at least two elements must be present for a person to be classified as an Impostor (Clance, 1985). As Harvey and Katz (1985) described, a typology can be created based on different combinations of these elements.

**The Impostor Cycle.** The Impostor Cycle (Fig. 2) describes a process of fear of failure in performance situations, a maladaptive working style, and a lack of internal success attribution. The cycle begins with

a performance task that is set for the Impostor. Due to their fear of failure, Impostors are prone to rumination (Dudău, 2014) and exhibit anxiety-related emotional and cognitive responses (Chrisman et al., 1995). The model describes two typical ways of responding to a performance task. Either the Impostor reacts over-ambitiously and precrastinates by starting the work very early and putting in too much work. Alternatively, they show avoidance behavior by procrastinating and starting work at the last possible moment (Thompson et al., 2000). In both cases, this maladaptive working style leads to success and the feeling of short-term relief after finishing the task. Nevertheless, due to the great effort expended in both cases, the success is attributed externally (to very early work engagement or intense work over a short period). This external success attribution inhibits an increase in self-efficacy. The lack of internal attribution of success ultimately leads to recurrence of the Impostor Cycle with the following performance task (Salkulku & Alexander, 2011).

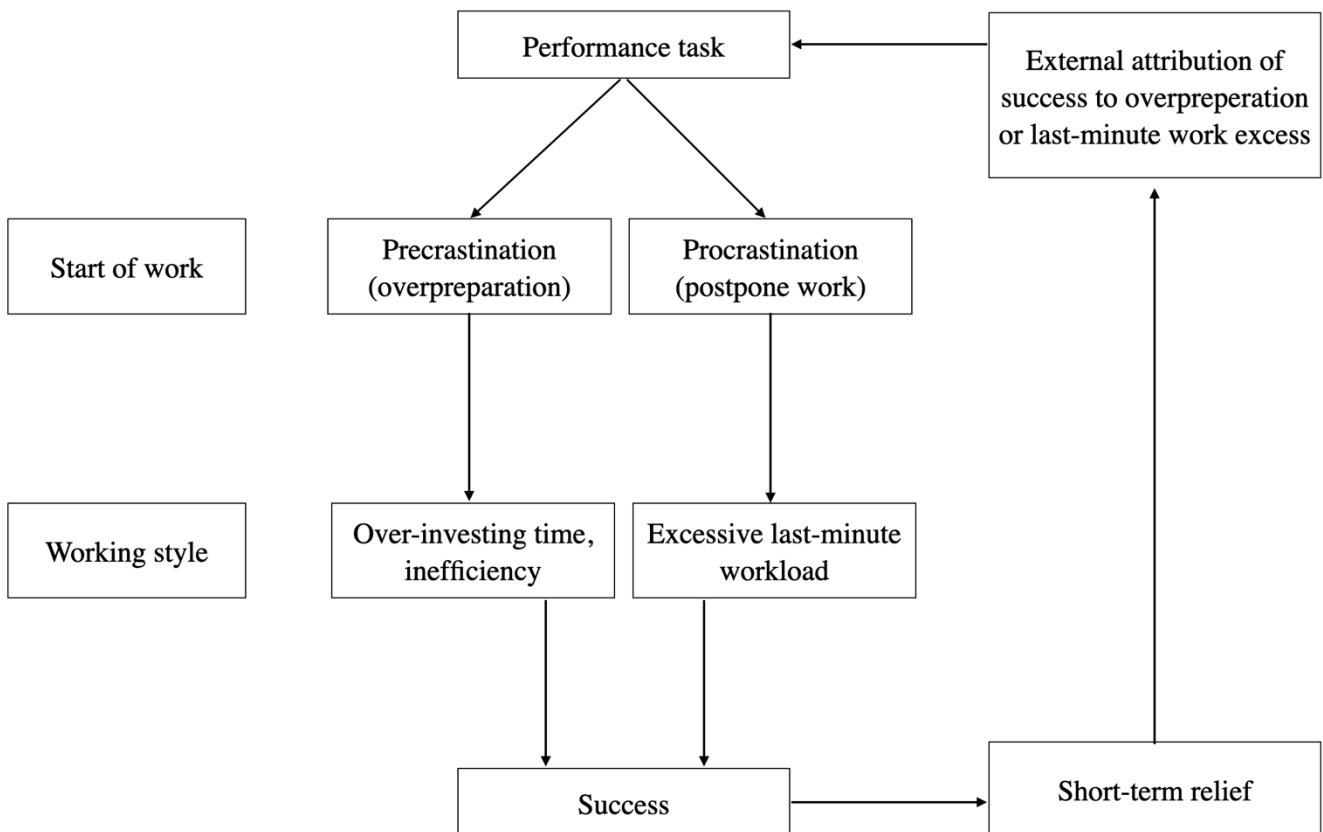


Figure 2. The Impostor Cycle according to Sakulku and Alexander (2011).

**The need to be special. The very best.** This element describes perfectionist aspirations and the desire to be extraordinary in one's field of interest. According to Clance (1985), Impostors are typically the best in their class during their school years and develop a norm-oriented understanding of performance. Therefore, switching to a more capable reference group, for example, by entering university, leads the imposter to devalue their performance due to their new lack of superiority.

**Superwoman/Superman aspects.** Impostors feel overwhelmed by performance tasks because they self-impose perfectionistic standards and overvalue their failures (Clance, 1985). In addition, they believe that real success must be achieved with ease and therefore secretly wish to be a genius (Clance, 1985). These perfectionistic self-expectations of being able to accomplish everything with ease illustrate the paradoxical aspect of this element. Only the ideal of being a supernatural genius can resolve the contradictions, at least in theory.

**Fear of failure.** The IP is particularly characterized by fear of failure, as manifested in stress symptoms (Chrisman et al., 1995) and performance-related anxiety (Fried-Buchalter, 1992), because every performance task has the potential to reveal the Impostor's perceived false success (Harvey & Katz, 1985, p. 19). Moreover, fear of failure is a strong driver for the Impostor's excessive work (Clance, 1985) and perfectionist aspirations. Therefore, the IP describes overcompensation in the form of a kind of defensive perfectionism.

**Denial of competence and discounting praise.** Impostors are characterized by external success attributions to luck, social persuasion, goodwill, and flawed judgments (Chae et al., 1995; Topping & Kimmel, 1985). Consequently, they do not accept praise (Sakulku & Alexander, 2011) and publicly emphasize their fallibility to lower the expectations placed upon them by their surroundings. This is not a form of false modesty (Clance, 1985). Moreover, this external attribution of success impedes the enhancement of self-efficacy and reinforces the circular dynamics of the Impostor Cycle.

**Fear or guilt about success.** This element describes that Impostors fear success as well as failure. Here, too, the IP takes on a paradoxical nature. The fear of success arises from challenges and expectations that may arise in the future, such as after a promotion. In addition, those affected are afraid of social rejection, which can arise from competition for career opportunities or envy (Neureiter & Traut-Mattausch, 2016). Furthermore, social advancement can lead to fear of rejection by family and friends if the position one has reached is atypical for one's social environment (McIntosh, 1985).

The overlapping elements comprise perfectionist aspirations, anxiety, and a maladaptive attribution style. The IP comprises intrapsychic paradoxies, such as perfectionist aspirations that must be achieved with ease, or the simultaneous fear of success and failure. The detailed definition of the IP by Clance (1985) made the phenomenon more tangible and has led to numerous research questions regarding how the IP intersects with existing personality constructs.

### **The Nomological Network of the Impostor Phenomenon**

In order to gain a basic understanding of how a personality construct is positioned within the psychometric realm, triangulation with the Big Five is a viable approach. The five-factor model turns out to explain 43% of the variance in the IP (Vergauwe et al., 2015). A particularly high correlation exists between neuroticism and the IP ( $r_s = .49 - .63$ ; Tab. 1), especially the facets of depression ( $r = .61$ ) and anxiousness ( $r = .45$ ; Ross et al., 2001). Another clear negative correlation exists with conscientiousness ( $r = -.49$ ; Bernard et al., 2002), especially the facets of competence ( $r = -.37$ ) and self-discipline ( $r = -.41$ ; Bernard et al., 2002). This negative correlation could be specifically explained by imposters' maladaptive work style. Nevertheless, it could also reflect imposters' distorted self-perception, as they tend to be overly self-critical in their self-assessments due to their perfectionist aspirations. The negative correlation of the IP with extraversion ( $r_s = -.05 - -.43$ ; Tab. 1) results from the Impostor's desire to give as few observational indicators as possible to maintain their positive external image and avoid a distortion of their external impression. Their fear of others' evaluations leads to interpersonal distance and social inhibition.

Table 1

*Overview of the correlations of the CIPS total score with the Big Five dimensions*

	Bernard et al., 2002 <sup>A</sup>	Chae et al., 1995 <sup>B</sup>	Ross et al., 2001 <sup>C</sup>	Vergauwe et al., 2015 <sup>D</sup>
Neuroticism	<b>.52</b>	<b>.60 (.63)</b>	<b>.64</b>	<b>.64</b>
Extraversion	-.05	<b>-.13 (-.15)</b>	<b>-.21</b>	<b>-.43</b>
Openness	<b>.19</b>	-.03 (-.01)	-.01	-.10
Agreeableness	.01	-.18 (-.14)	-.12	<b>-.18</b>
Conscientiousness	<b>-.31</b>	<b>-.36 (-.29)</b>	<b>-.24</b>	<b>-.41</b>

*Note.* Significant results are printed in bold; <sup>A</sup> CIPS and NEO-PI-R (Costa & McCrae, 1992); <sup>B</sup> CIPS und NEO-PI-R, results in brackets among women only; <sup>C</sup> HIPS and NEO-PI-R; <sup>D</sup> CIPS and NEO-FFI (Hoekstra et al., 2007).

A correlation study between the IP and the personality disorder scales of the Schedule for Nonadaptive and Adaptive Personality (SNAP, Clark et al., 1993) showed that the IP is strongly related to the scales for detachment, dependency, mistrust, and workaholism (Ross & Krukowski, 2003). Accordingly, the IP is characterized by anxiety and self-consciousness. In addition, affected persons have a high level of insecurity, especially in social interactions with other people, which leads to avoidance of attention. Therefore, Ross and Krukowski (2003) describe the IP as a maladaptive personality style and examine the construct from a psychopathological perspective. Lester and Moderski (1995) found that the IP was related to suicidal ideations ( $r = .36$ ) and suicide attempts ( $r = .32$ ) in a sample of high school students and that these relationships remained significant after controlling for depression. In addition, there are small to strong associations with manic and depressive tendencies ( $r = .17$  and  $r = .57$ , respectively). Chrismann et al. (1995) also found associations of the IP with emotional exhaustion, loss of intrinsic motivation, and an increased feeling of guilt. In line with these findings, Impostors exhibit increased test anxiety (Cusack et al., 2013) and lower overall mental health (Sonnak & Towell, 2001). Overall, these

findings underline that the IP is a maladaptive personality style, even though the ICD-11 and DSM V diagnostic systems do not include the construct as a personality disorder.

The construct-inherent elements of Clance's (1985) formulation were also psychometrically validated by examining the nomological network. The IP was found to be strongly related to fear of negative evaluation (Chrisman et al., 1995) and concern over mistakes (Thompson et al., 2000). Simultaneously, increased fear of success was also found, with this relationship significantly higher in women ( $r = .63, p < .001$ ) than in men ( $r = .29, p < .01$ ) in a study by Fried-Buchalter (1997).

**Relationship with self-esteem.** In a study by Vergauwe et al. (2015), self-efficacy was found to be the most crucial predictor of the IP ( $r = -.71$ ) among the core self-evaluations (self-esteem, generalized self-efficacy, emotional stability, and locus of control). Also, self-esteem was found to be strongly negatively correlated with the IP. Most research on the IP's relationship with self-esteem has found a strong ( $r < -.50$ ; Chrisman et al., 1995; Neureiter & Traut-Mattausch, 2016; Schubert & Bowker, 2019) or moderate ( $r = -.30 - -.49$ ; Caselman et al., 2006; Kolligian & Sternberg, 1991; Ross & Krukowski, 2003) effect. On the other hand, Edwards et al. (1987) found no relationship between the IP and self-esteem, but they used the Harvey Impostor Phenomenon Scale (HIPS) rather than the Clance Impostor Phenomenon Scale (CIPS). These two instruments have marked differences regarding the operationalization of the theoretical construct. Nevertheless, the question arises: Are the IP and low self-esteem basically overlapping constructs? According to Vergauwe et al. (2015), the IP cannot be reduced to self-esteem or self-efficacy because the construct represents a maladaptive personality style. In particular, the aspects of maladaptive perfectionism, fear of being exposed, and a maladaptive work style (pre-and procrastination) characterize the IP and distinguish it from self-esteem. However, in order to fully differentiate the construct from self-esteem, the comprehensive psychometric representation of these unique aspects is of major importance. The instrument we developed aims to capture these unique aspects and comprises subscales that are strongly, moderately, and even not related to self-esteem.

We explain these relationships in more detail in the first article of this dissertation project. However, it should be emphasized that the theoretical construct includes more than cognitive self-evaluations like self-esteem. Therefore, the divergences between these constructs can only be assessed by an instrument that captures these specific behavioral aspects. Also, the difference impostors perceive between self-evaluation and other-evaluation is a feature that distinguishes the IP from mere low self-evaluation. On the other hand, Leary et al. (2000) claim that Impostors rate themselves as incapable, while thinking that those around them also rate them as incapable. However, defining the construct in this way, without a divergence between one's self-perception and other-perceptions, makes it more difficult to distinguish from academic or global self-esteem. Overall, operationalizing the IP's distinct facets is essential to distinguish it from overlapping constructs such as self-esteem or global self-worth.

**Attributional style.** Impostors are characterized by an external attribution of success, which is particularly illustrated by the fifth theoretical element: Denial of competence and discounting praise (Clance, 1985). Additionally, Impostors attribute failures internally and overgeneralize them (Thompson et al., 1998). Brauer and Wolf (2016) examined the psychometric correlates of the IP with attributional style and determined that Impostors make external-unstable attributions in positive performance situations. An internal-stable attributional style in negative performance situations exists only when not controlling for depression, which indicates the depressogenic attributional style of impostors in negative performance situations. In a longitudinal study of attributional style and academic performance, Gibb et al. (2002) showed that a pessimistic attribution style (internal-stable attribution of negative events) was related to academic success in college (higher cumulative GPA) when the sample's overall academic ability was higher (higher SAT scores). Morris and Tiggemann (2013) also found a positive relationship between stable, global attributions of failure and academic achievement in their study of the impact of learned helplessness on academic achievement and explained this finding with IP. The IP-typical attribution style was also studied experimentally by Cozzarelli and Major (1990). The authors found that Impostors attributed failure internally and exhibited more negative affect in the face of failure.

Nevertheless, they found no difference between Impostors and non-Impostors in the attribution of success. Similar results were obtained by Thompson et al. (1998) in a vignette experiment and Thompson et al. (2000) in a Stroop test paradigm. Internal and global attribution of failure was not found among Impostors. Neither was external attribution of success found among imposters in either experiment. A lack of external attribution of success would call Clance's (1985) theoretical conception of the IP into question, as it is central to the Impostor Cycle, denial of competence and discounting praise, and fear of success. Rejecting and not internalizing success is a defining feature of the IP construct, which prevents the building of self-esteem, causes the discrepancy between external and self-image, and ultimately leads to the feeling of fraudulence. These experimental results lead to the question of whether different experimental designs are required to detect the external success attribution, such as perhaps success feedback that has more meaning for self-worth. Accordingly, future research must clarify whether Impostors do actually attribute success externally or whether the IP is a self-presentation style in order to produce a positive external image.

Ferrari and Thompsom (2006) showed that the IP was related to social desirability, perfectionistic cognitions, and concealing imperfection. Impostors, therefore, showed a stronger tendency toward self-handicapping and making face-saving excuses when they failed. Thus, as expected, the IP is related to self-presentation concerns in situations where self-worth is threatened.

The combination of perfectionism (Vergauwe et al., 2015) and procrastination (Rohrmann et al., 2016) illustrates that an Impostor seeks to maintain a positive external image. This positive external image can be maintained either through success or through the generation of an explanation for one's expected failure through self-handicapping (e.g., procrastination). Unfortunately, self-handicapping and impression management lead to a working style that can prove problematic in the increasingly agile work world, characterized by rapid learning and feedback cycles, a transparent error culture, and multi-tasking demands.



**The impostor phenomenon in the work environment.** The assumption that imposters may experience lower performance trajectories in agile work environments is supported by Hudson and González-Gómez (2021), who found a positive indirect effect of the IP on creativity through shame as a mediator. Additionally, there was an indirect effect of the IP mediated by shame on organizational citizenship behavior. The authors suggest that when Impostors feel ashamed because of failure, they repair their external image by increasing extra-role helping behaviors. Further research on the IP in organizations shows that Impostors exhibit less organizational citizenship behavior (OCB) and affective commitment (Grubb & McDowell, 2012). In addition, an adverse effect of the IP on external employability (perceived ability and willingness to take up a new job) has been identified. This partly explains the IP's association with a lower number of career moves (Klinkhammer & Saul-Soprun, 2009), as external career exploration generates new job opportunities and subsequently strengthens one's self-confidence for internal career negotiations.

In addition, imposters' career success is reduced by the fear of failure, which leads to a conscious choice in favor of less challenging, less potential-enhancing career paths (Klinkhammer & Saul-Soprun, 2009). For example, in a sample of female medical students, the IP was negatively related to research self-efficacy, which is considered an essential indicator of a future university career (Jöstl et al., 2012). The IP is thus a psychological barrier to academic careers at universities and creative activities with high demands for ambiguity tolerance. In a study by Rohrmann et al. (2016), half of all successful managers were affected by the IP and stated that they felt they did not deserve their current position. The status and recognition gained through their leadership position led to Impostor feelings rather than increased self-efficacy among those affected. These results highlight the paradoxical nature of the phenomenon, as even successes do not have a sufficient positive impact on self-worth. The company-wide implications of these effects are demonstrated by the fact that managers with Impostor tendencies are more likely to delegate challenging and routine tasks to employees who exhibit impostor tendencies (Bechtoldt, 2015). This can lead to a manager with impostor tendencies putting excessive strain on an employee with the

same tendencies. The combination of a maladaptive work style and perfectionist aspirations inherent in the IP leads to low processing efficiency, e.g., the ratio of work effort to outcome (Rohrmann, 2019, p.74). The combinations of high demands by the manager and low processing efficiency lead to high stress for the employee in the medium term. Rohrmann et al. (2016) found that Impostors experience a high level of stress and strain from their work, as well as difficulties in distancing themselves from their work in their private lives. The IP therefore also correlates positively with the burnout components of exhaustion, cynicism, emotional exhaustion, and depersonalization (Villwock et al., 2016). Overall, the IP should be more strongly considered in the work context, as it affects employees' performance, potential utilization, and psychological well-being. Therefore, the question as to what causes the impostor phenomenon is relevant for both personal and organizational psychology.

### **The Etiology of Impostor Fears**

In her fundamental work, Clance (1985) described four hypotheses for the development of the IP, which she derived from her experiences with affected persons in her counseling sessions. These four conditions for developing Impostor tendencies are related to family dynamics and parenting styles. The first cause, according to Clance (1985), involves a discrepancy between the Impostor's career path and the social context of the family. The impostor's talents and aspirations are thus atypical for the family. Clance describes an prototypical example in which a child is mathematically gifted while the family shows more artistic talent (Clance, 1985, p. 42). According to the current state of research, this cause of the IP remains hypothetical and requires deeper empirical exploration.

The second cause describes very high expectations by parents regarding their children's academic achievement. The family message is that intelligence and academic ability are the primary determinants of a person's worth. This perception is enhanced by comparing positive and negative examples from the family circle, which creates additional pressure on the children to perform. King and Cooley (1995) found a weak correlation between perceived family achievement orientation and the IP ( $r = .21; p < .05$ ),

which remained significant for males and females when the two groups were considered separately. The authors noted that investigating achievement orientations from the perspective of family members could contribute relevant additional findings.

The third condition for the development of IP tendencies involves a lack of congruence in assessing the affected person between family and non-family contacts. Clance explains that the family judges the Impostor differently from the rest of his or her social network (Clance, 1985, p. 50). Dinnel et al. 2002 (cited in Sakulku & Alexander, 2011) studied confusing messages from the family about academic performance. Confusing messages defined as incongruent regarding the abilities of those evaluated (from the family and non-family system to the Impostor) showed a moderate correlation with the IP ( $r = .33$ ). However, the study design only approximates the hypothesis formulated by Clance (1985). More meaningful would be to measure the difference in academic achievement messages from extra-familial systems, such as teachers and peers, and achievement messages within the family and correlate this difference with IP expression.

According to Clance (1985), the fourth and last developmental condition is a lack of praise from the family. This developmental condition is the best-studied one due to its clear operationalizability. One study's results found that a controlled or overprotective parenting style is weakly positive, and perceived paternal guidance moderately negatively related to the IP (Sonnak & Towel, 2001). Want and Kleitman (2006) found similar correlations, in which paternal control was positively and paternal guidance negatively related to the IP. According to both studies, the father seems to have more influence on IP expression. However, when differentiating the results by gender, maternal and paternal guidance are negative predictors of the IP for women. In contrast, only maternal guidance significantly predicts IP expression for men. Overall, research results on the influence of parenting style on IP expression are inconclusive, which can be explained in particular by the complexity and the interindividual differences among family systems. Therefore, a possible future approach would be to examine the personality facets which are influenced by the family system rather than perceived parenting styles. Yaffe (2020) pursued

this approach by examining the mediating influence of parental attachment, which predicts self-worth, on IP expression. His research showed that low parental care and overprotection positively influenced IP expression and that this effect was mediated by self-esteem. In a follow-up study, Yaffe (2021) also found a significant mediation effect of social anxiety on the relationship between perceived parenting style and Impostor expression, with 43% of variance explained by the model.

From this point of view, shifting the focus to mediating personality traits such as social anxiety and self-esteem seems to be more meaningful than examining parenting styles exclusively because those more proximately influence the IP characteristics of affected persons. Moreover, family dynamics differ and are challenging to measure in a psychometrically standardized way. In addition, other social connections, such as peers, friends, school, or employers, represent additional sources of influence not captured by perceived parenting styles; they are taken into account when examining mediating constructs such as influenced personality traits. Ultimately, it appears that parenting styles do not conclusively explain the emergence of the IP and that there are differences by gender regarding potential influencing variables. The importance of gender in research on the IP has since been attributed a special significance. Clance and Imes (1978) originally assumed that the IP only affected professional women, although there are contradictory research results on the influence of gender on IP expression. The question that has not yet been fully answered is the subject of a controversial debate: Are women more and differentially affected by the IP than men?

**Gender as a predictor of impostor feelings.** Research on the influence of gender on the IP has been controversial since the beginning. Due to the phenomenon's history, in which only very successful women were studied (Clance & Imes, 1978), the phenomenon was initially formulated as a gender-specific construct. However, further research has expanded this notion and examined the influence of gender as a predictor in different samples. The results are ambiguous, as in some studies, women are more likely to be affected (Jöstl et al., 2012; Shill-Russell et al., 2022), and in other studies, men (Kolligian & Sternberg, 1991; Topping & Kimmel, 1985). A meta-analysis by Bravata et al. (2019)

showed that out of 33 included publications, women exhibited higher IP scores in 16 of them. However, no gender differences were reported in 17 studies. Nevertheless, the results show that women are more likely to be affected by the IP. Furthermore, the prevalence of higher neuroticism (Schmitt et al., 2008) and lower self-esteem (McMullin & Cairney, 2004) among women, both of which are related to IP in the same direction, illustrate the potential influence of gender due to women's big five personality constellation. Nevertheless, the gender question cannot be conclusively answered by investigating total IP expression.

In addition to general prevalence, another open question concerns whether both genders are affected by the IP in the same way. Badawy et al. (2018) investigated the interaction of gender and IP expression in performance tasks, particularly with respect to stereotype threat in men. Men showed more anxiety in tasks with negative feedback and high accountability, consequently reducing effort and performance. On the other hand, women showed higher effort and performed slightly better in the negative feedback condition. Badawy et al. (2018) explain these findings with gender-specific expectations. Accordingly, men exhibit stronger self-directed expectation pressure, which they seek to reduce through self-handicapping in the form of reduced effort.

Overall, the study results by Badawy et al. (2018) show that the general prevalence in either gender may provide less insight than examining how both genders are differently influenced by IP expression. A more fine-grained view of gender differences in the subcomponents of IP could therefore contribute to understanding the divergent findings. Consequently, the first study of this dissertation project examines facet-based differences in IP expression (Ibrahim et al., 2021).

Age has been identified as a further demographic predictor, although the findings here are not conclusive either. Chae et al. (1995) and Thompson et al. (1998) found a negative correlation between the IP and age. However, other studies found no correlation (Oriel et al., 2004; Want & Kleitmann, 2006). Brauer and Proyer (2017) found a negative correlation among working professionals but not among undergraduate students. This difference shows that contextual factors, such as the workplace, can

interact with other predictors in a reinforcing way. Another demographic predictor related to the IP is ethnicity. Research shows that racial discrimination interacts with the IP and significantly influences mental health (Bernard et al., 2017). McClain (2016) even found that the IP is a stronger predictor of mental health issues than minority status. The study of the relationship between the IP and minority status is a relatively new area of research, which has fruitfully expanded the original theoretical formulation by Clance (1985). For successful individuals affected by stereotype threat evoked by their minority status, the discrepancy between their less capable and stereotype-influenced self-image and their external image as highly qualified ultimately generates Impostor feelings. Overall, it is clear that the findings on demographic predictors still require further research.

Personality traits such as self-esteem and neuroticism are the most relevant predictors of Impostor fears. So, specific subpopulations are particularly vulnerable to the IP, such as university students and high-achieving young professionals. Therefore, to make reliable statements about the prevalence of Impostor feelings among various subpopulations, reliable and valid measurement of this construct is necessary. The first instrument for measuring the IP was published by Harvey (1981), but multiple instruments have been developed, which I discuss in the following section.

### **Measuring the Impostor Phenomenon**

The first instrument to measure Impostor expression, the Harvey Impostor Phenomenon Scale (HIPS; Harvey, 1981), comprises 14 items. According to Mak et al. (2019), the one-factor structure has a reliability of  $\alpha = .34 - .85$  across studies. The instrument's factor structure has not been conclusively clarified; for example, Fried-Buchalter (1992) proposed a four-factor solution and Hellman and Caselman (2004) a two-factor one. These divergent findings on the psychometric quality and the desire to comprehensively operationalize the theoretical construct led Clance (1985) to develop her instrument.

The Clance Impostor Phenomenon Scale (CIPS; Clance, 1985) is the most well-established instrument for measuring the IP in research and practice and comprises 20 items. Extending the HIPS, the scale also measures evaluation anxiety and feelings of inferiority. The reliability of the CIPS has been investigated in numerous studies and is estimated to be very good to excellent,  $\alpha = .85 - .96$  (Mak et al., 2019).

Factor-analytical studies show that, after excluding four items, the instrument is most likely to have a three-factor structure with the factors of fake, luck, and discounting (Brauer & Wolf, 2016). French et al. (2008) identified a two-factor structure, and Simon and Choi (2018) a single-factor structure as most appropriate. Clance (1985) constructed the CIPS as a unidimensional questionnaire to measure overall IP expression. The cut-off values were based on her clinical experience but still require a standardization study ( $\leq 40/\leq 60/\leq 80$  allegedly correspond to low/moderate/high IP expression).

There is room for improvement in the item construction, as Item 1 (“I have often succeeded on a test or task even though I was afraid that I would not do well before I undertook the task”) and overlaps with the fourth option (“often”) on the five-point Likert scale. Item 17 and 18 exhibit the same overlap between item stem and response option. The duplication of the quantifier reduces the semantic precision of the items. In addition, the CIPS has complex, multipart items that enhance the difficulty of selecting a single answer option. Mummendey (1995; p. 63) recommends an upper word limit of 20 words per item, which 11 items in the CIPS exceed. The CIPS is a comprehensive representation of the IP, especially since Clance herself provided the original theoretical foundation for the construct (Clance & Imes, 1978). Nevertheless, the questionnaire lacks items on the element "The need to be special, to be the very best." Procrastination and precrastination within the element "Impostor Cycle" are also not represented in the CIPS. The CIPS is used in research and practice to survey overall expression. Although Clance formulated the IP as a multidimensional construct, she constructed the questionnaire unidimensionally. Increased congruence between the multidimensional theoretical construct and the measurement instrument is mandatory to further research conclusions and improved diagnostic possibilities.

Another questionnaire that takes into account the multidimensionality of the construct is the Perceived Fraudulence Scale (PFS; Kolligian & Sternberg, 1991). This instrument comprises 51 items forming two subscales. The Inauthenticity scale measures fraudulent feelings, thoughts, and actions and has excellent reliability ( $\alpha = .95$ ). The Self-Deprecation scale measures perfectionist tendencies and a self-critical attitude and, according to Kolligian and Sternberg (1991), also has very good reliability ( $\alpha = .85$ ). However, Chrisman et al. (1995) found that the PFS total scale has low reliability ( $\alpha = .57$ ) by calculating the 20-item CIPS reliability equivalent using the Spearman-Brown correction. Although the PFS was constructed to be two-dimensional, it has not received much use in research or practice, which can be attributed to Chrisman et al.'s (1995) findings and the fact that it is less economical due to the high number of items.

Another scale for measuring IP is the Leary Impostor Scale (LIS; Leary, 2000), which is the most economical instrument, with only seven items. The reliability is very good ( $\alpha = .87$ ), but only a total score is calculated here as well.

Rohrman et al. (2020) published the German-language Impostor-Selbstkonzept-Fragebogen (ISF), which contains 15 items and sums up into a total score. The German questionnaire has a high internal consistency ( $\alpha = .93 - .94$ ) and retest reliability ( $r_{tt} = .77$ ). The convergent validity is supported by correlation tests with the CIPS ( $r = .91$ ), the PFS ( $r = .85$ ) and the LIS ( $r = .78$ ). The ISF is the only scale with a standardizing study in a representative German sample of  $N = 1,736$  persons aged 16 to 73 years. The questionnaire provides T-values and percentile norms for interpretation. The instrument is only available in German.

Overall, it can be stated that despite numerous instruments and validation studies, there is no gold standard for measuring the IP. Therefore, Mak et al. (2019) conclude that the dimensionality of the construct and instruments should be further clarified in future studies to increase diagnostic viability. We intend to take up this call in the present dissertation project.



## Research Questions

This theoretical review of the IP has shown that the construct is well researched and is subject to increasing scholarly attention. Nevertheless, previous research gaps, conflicting findings, and potential for further development were illustrated, which we want to address with this dissertation project. It has become clear that a precise diagnostic tool is essential for further theoretical development, etiological research, and intervention studies. The CIPS is the most widely used instrument in research and practice, but there is room for improvement in item construction, construct representation, standardization, and especially dimensionality. Mak et al. (2019) highlighted the discrepancy between the multidimensional theoretical construct and the unidimensional CIPS. In our preliminary investigation, we sought to develop an instrument as a foundation for further research that captures all theoretical elements of the IP according to Clance (1985) and at the same time takes the multidimensionality into account. In our preliminary investigation, we asked ourselves: *Can the impostor phenomenon be assessed with a multidimensional and psychometrically solid instrument?* In our preliminary research, we intended to construct and validate such a questionnaire.

After constructing and initially validating a multidimensional questionnaire, the Imposter-Profile, we sought to answer whether these scales form a general factor. This general factor, which aggregates the various subscales, would be quite helpful for research and practical use. In addition, a general factor based on construct-related subscales can be an indicator of the validity of convergent instruments for measuring the IP. However, there is still no consensus on the relationship between the IP and gender in addition to the general factor question. Our second research question is therefore: *Do the scales of the Imposter-Profile form a second-order factor that is substantially related to CIPS scores, and are there gender differences at the subscale level and in overall IP expression?*

In answering the second research question and further developing the Imposter-Profile, we would like to use the instrument to address a current gap in IP research: *Can the attributional bias of Impostors be*

*validated experimentally?* Previous experimental validation attempts (Cozzarelli & Major, 1990; Thompson et al., 1998; Thompon et al., 2000) failed due to a lack of significant findings on the external attribution of success, which is key to explaining the elements of discounting praise and the Impostor Cycle in Clance's (1985) conceptualization.

Finally, the last research question of this dissertation project involves making the instrument available for international research by validating the English version of the Imposter-Profile. In addition, we would like to conceptualize and investigate a new approach to the etiology of the IP, which explains the construct through learned helplessness. The resulting research question is twofold: *Firstly, does the English-language Imposter-Profile show factorial validity and good psychometric properties; Secondly, can an exploratory path model support the anticipated correlations within the learned helplessness model of the impostor phenomenon?* This question is the subject of the third and final study.

### **Preliminary Study: The Construction and Validation of the Impostor-Profile**

Ibrahim, F., Münscher, J. C., & Herzberg, P. Y. (2020). The facets of an impostor–development and validation of the Imposter-Profile (IPP31) for measuring impostor phenomenon. *Current Psychology*, 1-12.

### **Summary**

In the preliminary study by Ibrahim, Herzberg, and Münscher (2020), we describe the construction process and validity of the Imposter-Profile. This study yields a questionnaire comprising a total of 31 items and six scales. The psychometric properties of this questionnaire are satisfactory, and convergent and divergent correlations with the Big Five, self-esteem, and the CIPS support the construct validity.

### **Study objective**

In this preliminary study, we wanted to create a psychometric foundation for answering the research questions of this dissertation and at the same time, develop an instrument that offers value for practical purposes. According to Mak et al. (2019), there is no gold standard for measuring the IP, mainly because the multidimensionality of the construct is not represented in existing questionnaires. Therefore, this study's primary aim was to construct a profile consisting of several scales that represent the theoretical elements formulated by Clance (1985). The first step towards constructing such scales was to review the foundational literature (Clance, 1985; Clance & Imes, 1978; Harvey & Katz, 1985) and the influential review article by Sakulku and Alexander (2011). The aim of this process was identify traits that describe Impostors in a prototypical way, cluster them, form latent traits, and formulate items that capture the associated theoretical elements. This item pool was initially reduced through expert rounds and an initial exploratory factor analysis. Subsequently, this reduced item pool was reduced again through a further exploratory factor analysis with a new data set, with the aim of achieving adequate model fit. The resulting questionnaire was then tested via conformational factor analysis with a new sample to test the factorial validity and the psychometric properties of the Imposter-Profile. Lastly, the construct validity of the resulting scales was examined using correlation tests.

### **Findings and interpretation**

The literature review resulted in a list of IP-typical characteristics, which we grouped into five categories. We described these categories with the following terms: Idealistic Ambition, Sorrow-System, Ingratiation, Belief in Incompetence, and Inauthenticity. We then generated 90 items for each of these prototypical latent IP characteristics. From the initial total of 450 items, 162 items were selected in expert rounds that reflect the construct in the opinion of the three experts and meet Mummendey's (1995) item construction principles. For further distillation, an initial investigation was conducted in which the item pool was further reduced using exploratory factor analysis and item exclusion due to

insufficient principal loadings. The result of this preliminary investigation was an instrument with 65 items constituting seven factors. After initial item construction and reduction, the instrument was further optimized in the main investigation of this preliminary study. Specifically, a new total sample was randomly divided in order to conduct the exploratory and confirmatory analyses with different subsamples. The second exploratory factor analysis and item exclusion resulted in an instrument with 31 items composing six scales. These scales, namely Competence Doubt, Working Style, Alienation, Other-Self Divergence, Frugality, and Need for Sympathy, also captured the IP in a meaningful way. Lastly, the resulting six-factor instrument was examined in a confirmatory factor analysis with the second subsample.

The factorial validity as well as psychometric properties of the Imposter-Profile were satisfactory. At last, we investigated the construct validity of the Imposter-Profile with convergent constructs. The most comprehensive scale, Competence Doubt, showed a strong relationship with neuroticism ( $r = .68$ ), the CIPS score ( $r = .80$ ), and global self-worth ( $r = -.74$ ). Divergent validity was indicated by Competence Doubt's low correlation with Openness ( $r = .11$ ), which is consistent with previous findings on the IP (Tab. 1). Interestingly, the scales for Frugality as well as Need for Sympathy showed no correlations with the CIPS. Nevertheless, these scales capture elements inherent to the IP construct, so these scales, in particular, represent incremental value compared to the CIPS. A question that has already been raised is whether the IP basically corresponds to low self-esteem. The difference between the instrument and global self-worth is evident with respect to the scales beyond Competence Doubt. Self-worth is also strongly related to Alienation ( $r = -.53$ ), but only moderately related to Other-Self Divergence ( $r = -.48$ ) and Working Style ( $r = -.30$ ). Frugality (later Ambition) and Need for Sympathy show no correlation with global self-worth. Overall, the scales apart from Competence Doubt capture the incremental input that psychometrically distinguishes the IP from global self-worth. Low self-worth lies at the core of the IP. However, further aspects measured by the other scales, such as the feeling of inauthenticity and fraudulence (Alienation), the sense of being overestimated by others (Other-Self Divergence), a

tendency toward pro- or precastination (Working Style), the desire to be well-liked (Need for Sympathy), and a highly pronounced drive to perform (Ambition) distinguish the construct from the purely cognitive self-assessments of self-esteem or global self-worth.

### **Perspective**

The primary goal of the study was achieved through induction (extraction of the IP's typical features from the primary literature and formation of latent categories), deduction (deduce items from the latent traits), and distillation (multiple factor analyses), ultimately leading to the Imposter-Profile. This instrument measures the IP with six scales, shows good psychometric properties, and reflects the theoretical construct adequately. The correlation results are considered indicators of construct validity, with the Frugality and Ambition scales in particular providing incremental information. Since previous instruments on the IP measure the construct with a total score, the construction of this multidimensional instrument raises the question: Do the Imposter-Profile scales constitute a second-order factor? Such a general factor would make it possible to calculate a total score and serve as a validity criterion for existing IP instruments. Another question that arises concerns whether the divergent findings on gender differences are more evident at the subscale level. Furthermore, an assessment tool in profile form allows for a cluster analysis of individuals with high overall IP expression to identify different prototypical subscale combinations. This enables a quantitative examination of the typology formulated by Harvey and Katz (1985). In the subsequent investigation, we examined the first and second issues raised.

### **Article 1: Confirmatory Examination of the Impostor-Profile to Determine a Total Score and the Facet-Based Analysis of Gender Differences.**

Ibrahim, F., Münscher, J. C., & Herzberg, P. Y. (2021). Examining the Impostor-Profile—Is There a General Impostor Characteristic?. *Frontiers in Psychology*, 3847.

## **Summary**

In Ibrahim, Münscher, and Herzberg (2021), we compared four models by mean of CFA in terms of goodness-of-fit to find a potential higher-order factor and examined gender differences in total scores and at the subscale level. In addition, the IP's nomological network was extended through correlation studies.

We found that the bifactor model had the best goodness-of-fit, meaning that it was subsequently used as a working model. Examination of the measurement invariance across gender showed significant gender differences, which manifested more explicitly at the subscale level. Nomological validity was supported by the IPP total score's correlations with internal-stable-global attributions in negative situations and external-unstable-local attributions in positive situations.

## **Study objective**

The preliminary study results led to the development of the Imposter-Profile (IPP31), which comprises six scales and 31 items. The profile is meaningful for practical use since individual facet expressions can be assessed, and interventions can be aligned to specific individual profiles. Nevertheless, it would be helpful for practical use and research to identify a higher-order factor, composed of the six scales, in order to be able to assess general IP expression using a total score. This total score would expand the possible applications of the IPP31 as a screening instrument and allow general IP expression to be triangulated with other constructs in the psychometric space. In order to identify a possible second-order factor, this study aimed to conduct a confirmatory analysis of four competing models. Furthermore, the second research question, to what extent gender differences manifest at the subscale level, was answered by examining measurement invariance across gender. Lastly, the instrument's nomological network was

extended through correlational analyses with attributional style, honesty-humility, and concern for appropriateness.

### **Findings and interpretation**

Examination of the descriptive item characteristics showed a high standard deviation for Item 28. A closer examination showed the item to have a highly right-skewed distribution for males and bimodal distribution for females. Subsequently, we tested the four confirmatory models for the IPP with and without Item 28. It was found that the bifactor model had the best goodness-of-fit compared to the six-factor, single-factor, and second-order factor models. Without Item 28, the goodness-of-fit and reliability of the Ambition subscale improved significantly, so we used the version with 30 items in all further analyses (IPP30). In addition, we renamed the Frugality scale to Ambition because the latter term was more in line with the theoretical construct and the direction of the item loadings. From a psychometric point of view, the bifactor model is beneficial as it captures the instrument's profile purpose, as the general factor (total score) and the group factors explain different shares of variance. Therefore, the bifactor model reinforces the initial idea of a combined use of a total score and subscale expression for assessment. Furthermore, according to Reise et al. (2010), a bifactor model makes it possible to test the measurement invariance at the subscale level.

The reliability of the IPP total score was very good,  $\omega = 0.95$ . Also, the IPP30's subscales showed sufficient reliability ( $\omega_s = 0.91 - .71$ ). As in the previous study, Need for Sympathy showed poor reliability ( $\omega_s = 0.50$ ) and should be interpreted only in the context of the overall profile and not as an individual indicator. In the second step, measurement invariance across gender was examined. We found that configural, metric, and partial scalar measurement invariance achieved a sufficient goodness-of-fit. Accordingly, the latent traits captured by the IPP scales are comparable across gender. However, examination of scalar measurement invariance substantially worsened the goodness-of-fit ( $\Delta CFI = -0.005$ ;  $\Delta RMSEA < 0.001$ ), so gender-specific norm values must be considered for standardization

studies. Examination of gender differences showed only small associations between gender and the total score, with females exhibiting slightly higher values ( $r = .10$ ). However, a more fine-grained examination showed that women had higher expressions of Competence Doubt ( $r = .20$ ) and Need for Sympathy ( $r = .14$ ). Men showed higher expressions of Ambition ( $r = -.10$ ). These results explain the divergent findings on gender differences, because existing IP instruments measure overall expression of this multidimensional theoretical construct. Accordingly, the differences at the facet level cancel out each other and only become apparent when examining the subscale level. Accordingly, two individuals can have a similar overall IP score but significantly differ at the facet level. The complexity of the theoretical construct is represented by the profile approach and thus enables more differentiated individual diagnostics. Indicators for the nomological validity of the IPP total score were the strong relationship with the CIPS ( $r = .78$ ) and attribution style in negative situations ( $r = .41$ ). The relation between the IPP total score and attribution style in positive situations was low ( $r = -.13$ ) and aligns with the findings of Brauer and Wolf (2016). Interestingly, the IPP total score and the honesty-humility scale were negatively related ( $r = -.27$ ). This finding contradicted our hypothesis but seemed retrospectively reasonable, since Impostors feel that they are frauds and phonies. The moderate correlations of Other-Self Divergence with the attention to social comparison scale ( $r = .33$ ) supported the IPP subscale's validity. Additionally, Alienation and the situational variability scale were highly correlated ( $r = .62$ ), indicating that a perceived lack of authenticity was examined as intended.

### **Perspective**

The IPP30 allows us to assess general IP expression and its facets and thus has incremental value for practice and research. In contrast to previous instruments, our instrument was constructed inductively, e.g., from the subscales to the total value. Thus, the high correlation between the IPP total score and the CIPS also functions as a validity criterion for the CIPS. The profile and total score application of the IPP leads to further research questions, such as the clusteranalytic investigation mentioned above.



Accordingly, individuals with increased IP expression could be cluster-analyzed to determine whether they form different types in terms of subscale expressions. These different types might in turn pursue different maladaptive behaviors to reduce their Impostor feelings. For example, a type with high expression of Ambition may gain confidence by seeking out formal accolades and performance indicators (male prototype). A type high in Need for Sympathy is more likely to create a positive social impression to compensate for perceived competence deficits (female prototype). Leonhardt et al.'s (2017) typology of true and strategic Impostors could also be empirically validated through a cluster analysis based on the IPP30. Another important question concerns whether the IPP30 can be validated in an English version in order to ensure its accessibility to the international research community. In addition, the experimental validation of external attributions of success would be an important finding for IP research because this attributional bias is a central assumption of the theoretical construct that has not yet been confirmed empirically. Moreover, experimentally investigating the IP's influence on success and failure attribution would represent a validation criterion for the questionnaire. We selected this latter issue as the primary research objective in the subsequent study.

## **Article 2: Examination of Success and Failure Attribution in Impostors Using a Bogus Intelligence Test.**

Ibrahim, F., Goeddertz D., & Herzberg, P. Y. (2022). The Experimental Validation of the Non-Self-Serving Attributional Bias in Impostors. [resubmitted for publication in *Current Psychology*]

### **Summary**

In Ibrahim, Goeddertz, and Herzberg (2022), we examined the moderating influence of imposter expression on attributional style following success and failure using a bogus intelligence test. We also examined the relationship between mindset and the IP in a success and failure condition and found that

Impostors attribute success externally-unstably and failure internally-stably. In addition, the IP and mindset are positively related to one another, as expected.

### **Study objective**

The IPP total score was derived and validated in the previous study to measure total IP expression. However, this validation only consisted of a correlation study of convergent and discriminant constructs. A further crucial step in the validation of the IPP is, therefore, an experimental investigation of the influence of Impostor expression on a criterion variable. According to Clance (1985), Impostors are characterized by attributing their success to luck, special effort, or the goodwill of others. This external attribution of success thus prevents the development of self-efficacy and is why a discrepancy arises between one's self-image and other-image. Therefore, an experimental investigation of non-self-serving bias in the IP (external attribution of success and internal attribution of failure) would represent a validity criterion for the IPP total score and the theoretical construct itself. Previous experimental validation studies regarding success attributions in Impostors did not detect the expected bias. Cozzarelli and Major (1990) found that Impostors felt worse about failure and self-esteem decreased more after failure, but success attribution did not differ from non-Impostors. Thompson et al. (1998) and Thompson et al. (2000) also found a moderating effect of the IP on the effect of failure on attribution, but no moderating effect for success was found. Therefore, the question arose as to whether the experimental design of previous studies (Cozzarelli & Major, 1990; Thompson et al., 1998; Thompson et al., 2000) had to be modified to increase the relevance of success or failure for the subject to detect attributional bias in Impostors. Consequently, in this study, we conducted a bogus intelligence test in which the subjects were randomly assigned to a positive or negative feedback condition. The bogus construct of what we termed "inductive-holistic problem-solving competence" was described within the study as a valid indicator of future success and assessed via an online test battery. First, proficiency in mindset (implicit theory of intelligence) and Impostor proficiency were assessed using the IPP. Second, attributional style

was assessed after participants received their results. The first research objective was to determine the moderating effect of the IP on the relationship between success (positive outcome) and failure (negative outcome) on attribution style (locus of causality and stability). In addition, we wanted to examine the IP's relationship with the mindset construct in cases of success and failure. A fixed mindset (incremental theory) describes the belief that intelligence is not changeable. People with a fixed mindset have a performance goal orientation and, like Impostors, believe that effort is evidence of a deficiency in ability (Dweck & Yeager, 2019). A fixed mindset is thus related to negative affect (King, 2016) and decreases positive affect after success when effort was required (Dweck, 2006). Therefore, due to the conceptual overlap between mindset and the IP, the study's second aim was to investigate this association quantitatively.

### **Findings and interpretation**

The study results show that the IP moderates the influence of feedback condition on attribution style. Impostors are more likely to express an external-unstable attribution of success (positive feedback). In the case of failure, higher IP expression leads to a more internal-stable attribution. The moderation effect for locus of control is greater than for stability. Overall the non-self-serving bias could be determined experimentally for the first time. This interaction effect is a validation criterion for the theoretical conceptualization of the IP and the IPP total score. As expected, the correlation study for mindset and IP showed a moderate positive correlation. Even though the correlation between mindset and the IP was only moderate, further research on both constructs seems to make sense from a conceptual point of view. Both constructs are linked by a performance orientation, the belief that effort reflects a low level of talent, and a tendency to engage in increased impression management. From this perspective, mindset could be a key factor influencing the development of Impostor tendencies.

## **Perspective**

This study experimentally supported a non-self-serving bias in Impostors for the first time, so it should continue to be considered an important element of the theoretical construct. In particular, the external attribution of success prevents the development of self-efficacy and leads to an increasing divergence between perceptions of one's abilities held by the social environment and one's own perception of one's abilities. This discrepancy is responsible for the imposters' feelings of fraudulence and phoniness.

Interventions that address this maladaptive success internalization would be a central mechanism for reducing Impostor feelings. The relationship between mindset and the IP should be further investigated in future research. Although the correlation study only indicated a moderate correlation, the two constructs share substantial overlap theoretically, such as the external attribution of success (Licht & Dweck, 1984), effort beliefs (Miele et al., 2013), and increased impression management (Burnette et al., 2013). In early research on mindset, Licht and Dweck (1984) found that high-achievers with a helpless response pattern were successful but could not internalize success. The belief that intelligence is fixed led to a performance goal orientation and learned helplessness (Elliot & Dweck, 1988). Morris and Tiggemann's (2013) study showed that learned helplessness did not lower academic performance. The authors explained this lack of negative effect on academic performance with the IP. This finding raises the question of the extent to which the IP is related to learned helplessness and how a fixed mindset and defensive pessimism could be part of an explanatory model of the IP. We addressed this question in the last article of this dissertation.

### **Article 3: Learned Helplessness as a Central Component in Explaining the Impostor Phenomenon and Validation of the English Imposter-Profile**

Ibrahim, F., Münscher J.C., & Herzberg, P. Y. (2022). The Validation of the English Imposter-Profile 30 and Exploratory Formulation of the Learned Helplessness Model of the Impostor Phenomenon. *Acta Psychologica* [accepted for publication in April 2022]

## **Summary**

In Ibrahim, Münscher, and Herzberg (2022), we combined the IP's identified relationship with mindset and other constructs related to the IP into an exploratory path model that postulates learned helplessness as a central influencing factor. In addition, we wanted to investigate the psychometric properties and factorial validity of the English IPP. The psychometric properties of the English IPP were sufficient, and the bifactor model has the best fit in the English IPP as well. Furthermore, the exploratory LHMIP has a good fit after a few adjustments and explains the emergence of the IP through the key construct of learned helplessness.

## **Study objective**

This study aimed to confirmatorily examine the English IPP and develop an explanatory model of the IP that links previous study results and theoretically derived construct intersections. The previous study showed that mindset influences the IP in response to positive and negative feedback. Convergence between the content of the two constructs also comes in the form of increased expectations of failure (Dweck, 1975) and the belief that effort is an indicator of a deficit in intelligence (Dweck & Yeager, 2019). Mindset develop as a core meaning system in childhood, with person-related praise (praise for intelligence) leading to a fixed mindset and process-related praise (praise for effort) leading to a growth mindset (Mueller & Dweck, 1998). Therefore, as the first component of our model, we investigated whether participants who were labelled very talented during their childhood by parents, teachers, and peers, reported a stronger fixed mindset. According to the model, this resulting fixed mindset then influences the expression of learned helplessness because of the relation with performance goals, internal attribution of failure, and reduced performance in the face of failure. Learned helplessness is the central component in the model, reducing perseverance and therefore grit as well (Duckworth et al., 2007). In addition, following Morris and Tiggemann's (2013) hypothesis, who explained the lack of

influence of a depressogenic (helpless) attributional style on academic performance with the IP, we hypothesize that learned helplessness has a direct influence on the IP. In addition, we expect learned helplessness to increase thought-action fusion because the belief that thinking about an event influences the likelihood of its occurrence may act as a strategy to reduce helplessness. This might result in a superstitious control belief in which defensive pessimism is considered a prerequisite for success. A statement by an Impostor in a qualitative study by Martin et al. (2003) illustrates this idea: “In the past when I've looked at things optimistically, something bad has happened and now I question myself all the time.” The model further postulates that defensive pessimism functions as a self-protective strategy in Impostors (Norem & Cantor, 1986b). Because they are usually defensively pessimistic but still succeed, they form an implicit contingency perception of defensive pessimism as a prerequisite for success. Norem and Cantor (1986a) likewise note that defensive pessimism tends to be exhibited by high-achieving, anxious individuals, which illustrates a parallel with the IP. Overall, this exploratory model aims to explain the emergence of the IP not through parenting styles but through interrelated constructs and their interplay.

### **Findings and interpretation**

The reliability of the subscales of the English IPP30 was sufficient to very good ( $\omega = .68 - .93$ ), with Need for Sympathy showing only insufficient reliability ( $\omega = .57$ ). We again pointed out that this subscale should be considered in the overall profile and not as a solitary indicator. The IPP total score showed very good reliability ( $\omega = .94$ ). The confirmatory examination of the factor structure showed that the bifactor model had the best goodness-of-fit compared to the other models (six-factor, single-factor, second-order), making it possible to calculate a total score. The nomological validity of the subscales was indicated, for example, by the negative correlation of Alienation with a growth mindset ( $r = -.44$ ). The correlations of the IPP subscales with learned helplessness were high ( $r_s = .56 - .69$ ), except for Ambition ( $r = .07$ ) and Need for sympathy ( $r = .08$ ), which were not related to learned helplessness and

are therefore considered important IP-inherent characteristics that distinguish the IP from learned helplessness, just as in the first study (Ibrahim et al., 2021).

The exploratory path model was augmented after examining modification indices by adding three direct and two indirect paths. Overall, all hypothesized relationships were confirmed. The formulated LHMIP is explicitly exploratory in nature, as the correlations do not allow for any conclusions about causality. The direction of the correlations was only derived theoretically. Nevertheless, this path model helps explain the relations among neighboring constructs and provides new impulses for etiological research on the IP. The high correlation of learned helplessness with the IPP total score ( $r = .71$ ), as well as with constructs converging with the IP, such as grit ( $r = -.60$ ) and defensive pessimism ( $r = -.38$ ), demonstrates the central role of the construct in this model. Learned helplessness in Impostors would explain defensive pessimism as a self-protective strategy. Also, the correlation between the likelihood subscale of learned helplessness with the thought-action fusion scale ( $r = .56$ ) indicates that learned helplessness increases the tendency towards superstitiousness. Thus, a possible superstitious belief might include perceiving defensive pessimism as a prerequisite for success. Accordingly, Impostors may have internalized the belief that "pride goeth before a fall" and avoid pride by developing a defensive pessimistic attitude.

### **Perspectives**

In sum, the English IPP30 could be validated and is ready for use in English-speaking countries. The next step to increasing usability in a practical context would be a standardization study. Norm values would enhance the interpretability of the total score and subscale expressions. In addition, cluster-analytical studies could determine typological profiles, which would also be valuable for practice by making it possible to develop distinct interventions for different types of Impostors. The LHMIP is a path model with an exploratory purpose. The directions of effects formulated in the model must be tested in further studies before assuming causality. Nevertheless, we believe that this model will

contribute to further research on the etiology of the IP. In addition, we wanted to triangulate the different proximate constructs and identify interrelated mechanisms. Future research could examine whether extending the model to include still other constructs is reasonable. Overall, however, our intention in proposing this exploratory model is to consider the IP more as an amalgamation of several interacting intrapsychic mechanisms.

### **General Discussion**

This dissertation project aimed to develop an instrument to assess Impostor expression on a facet and total level. In the preliminary study, we developed and validated the initial Imposter-Profile (IPP31). In the first study of the dissertation project, we further developed the instrument (IPP30) and fitted a bifactor model, making it possible to calculate a total score and subscale expressions. In the second study, we found non-self-serving attributional bias in Impostors in an experimental research design, which lends support to the theoretical construct and the validity of the IPP total score. Finally, in the third study, we demonstrated the factor validity of the English IPP30 and formulated an exploratory model to explain the constructs influencing the IP.

### **Summary of results**

Overall, this dissertation project took a bottom-up approach, focusing on diagnostics, validation, and finally on modeling and extending an etiological framework. The core of this project was the construction of a multidimensional questionnaire to measure Impostor expression. At the same time, we wanted to use this instrument to address existing questions about experimental validity and gender differences. Finally, we sought to create an exploratory model for the etiology of the IP by linking it to several proximal constructs.

The questionnaire's construction process in the preliminary investigation resulted in a six-scale instrument, which captures the aspects of the IP defined by Clance (1985). The correlation analysis of



the IPP31 with the CIPS also supported the instrument's validity, and the scales for Frugality and Need for Sympathy did not show any correlations with the CIPS. Therefore, they were considered to reflect the instrument's incremental diagnostic value, as the CIPS does not cover these aspects of the IP.

The possible presence of a general factor was examined in the second study. The evaluation of four competing factor models showed that the bifactor model had the best goodness-of-fit and made it possible to calculate a total score. This total score captures general Impostor expression, broadening the practical and scholarly implications of the IPP. In addition to total expression, the subscale expressions also provide further information. Furthermore, the bifactor model specifically required combined use of the total and subscale scores, since variance is explained both by the bifactor (total score) and the group factors (subscales) simultaneously. Therefore, the bifactor model exhibits the best psychometric properties and corresponds most closely to the intended holistic use of the instrument.

The bifactor model also allows for determining measurement invariance at the subscale level, which we used in this study to examine gender differences. We modified the question of whether general Impostor expression differs by gender, asking instead: In which Impostor-typical characteristics are gender differences present? The investigation of measurement invariance showed that the latent trait meanings of the IPP scales are comparable across genders. However, the differences are significant, so a gender-specific standardization is necessary and should be conducted in future investigations. Women have higher scores on Competence Doubt and Need for Sympathy, whereas men have higher scores on the Ambition subscale. Such differences are not evident when examining total scores only and illustrate why a multidimensional instrument is valuable for more fine-grained investigations. If these gender differences are confirmed in future studies, they could lead to a gender-specific perspective regarding Impostor feelings.

Another outstanding issue in prior research concerned validation of imposters' attribution style. In particular, external attribution of success is a core theoretical feature of the IP. It inhibits self-efficacy development and ultimately leads to divergence between one's self-concept and other-concept, which is

the basis for feeling like an Impostor. The second study investigated the moderating influence of IP expression on attributional style following success and failure by administering a bogus intelligence test in which subjects were randomly assigned to the success or failure condition. The results showed that the IP has a moderating influence on attributional style, with Impostors attributing success externally-unstably and failure internally-stably. These results are the first experimental validation of the non-self-serving bias in Impostors and support the theoretical foundation and external criterion validity of the IPP total score.

Thus, the IPP30 had at this point been constructed and psychometrically and experimentally validated. Subsequently, we wanted to make the instrument available for English-speaking countries by validating the factorial structure of an English version of the IPP. In addition, we intended to contribute to causal research by formulating an exploratory model showing the IP's relationship with related constructs, thus creating a potential framework to stimulate subsequent research and hypothesis formulation. The factorial validation of the English IPP30 indicated that the bifactor model continued to have the best goodness-of-fit. Accordingly, a total score can also be calculated using the English IPP30. Furthermore, a correlation study of the subscales with the constructs of learned helplessness, mindset, grit, thought-action fusion, and defensive pessimism supported the criterion validity of the English version. Finally, the LHMIP was formulated, an exploratory model explaining the development of the IP.

The initial version of the model was adapted by examining modification indices, adding three direct and two indirect pathways. This exploratory path model represents the interrelationships between the constructs and proposes directions of effects, although the latter are only hypothetical and need to be examined in future research. The path model essentially posits that the IP is a form of learned helplessness. This hypothesis originates from Morris and Tigge mann (2013), who found no negative impact of learned helplessness on academic performance and attributed this to the IP. The exploratory LHMIP posits that the IP is partially generated by a fixed mindset, which results from being labeled

especially talented in childhood by parents, peers, or teachers. This fixed mindset includes the conviction that intelligence and abilities are unchangeable.

On the one hand, this perceived immutability leads to helplessness, because one is literally at the mercy of one's aptitudes and abilities. In addition, a fixed mindset leads to a performance goal orientation since one wants to convince oneself and one's environment that one is intelligent. The resulting learned helplessness reduces grit because perceived powerlessness reduces the long-term effort one puts into influencing future results or development. Low grit increases the IP facet of a maladaptive working style (pro- or precrastination). The second consequence of learned helplessness is greater superstitious beliefs. On the one hand, a fixed mindset increases superstitious beliefs due to a performance goal orientation, which implies a dependency on the performance assessor. On the other hand, superstitious belief is increased by learned helplessness because those affected feel they have little influence on future developments. Superstitiousness is thus a way to positively influence one's control beliefs regarding future events or the opinion of others. The model also links thought-action fusion (superstitiousness) and defensive pessimism. Accordingly, defensive pessimism could be a manifestation of superstitious control beliefs. How could this connection be manifested in Impostors? Impostors may exhibit a higher tendency to superstition as a way of reducing their feeling of helplessness. Impostors are very successful and show early success at school. At the same time, however, they perceive high expectations from others and deliberately engage in defensive pessimism to reduce these expectations. This consolidates a process of operant conditioning in which Impostors are defensively pessimistic regarding a performance task and nevertheless receive positive performance feedback at the end. If this sequence of defensive pessimism and subsequent success is repeated, an perceived implicit association in which a defensive pessimistic attitude is a prerequisite for success is consolidated. This implicit association is a superstitious belief. Thus, it is conceivable that Impostors would react aversively if they had to assess themselves optimistically after a performance task because they would believe that this would negatively affect their results. This feeling would be irrational and the result of an implicit superstition.

Overall, the LHMIP is an explicitly exploratory model that needs to be examined longitudinally in future research to determine the directions of effects among the constructs. Qualitative research should also be conducted to test the model, especially with regard to the hypothesized superstitious control beliefs.

Nevertheless, this model should provide an impulse for the development of new research hypotheses and intervention methods and can connect theoretically overlapping constructs into a coherent framework.

### **Limitations**

The knowledge gained from studies must always be considered in light of their limitations. In the following, we would like to summarise the limitations of the studies described. Overall, the German and English versions of the IPP30 show sufficient factorial validity. Nevertheless, the bifactor model in the English version did not meet all cut-off values for goodness-of-fit according to Hu and Bentler (1999). Furthermore, the studies showed that the Need for Sympathy scale had a low internal consistency. Therefore, this subscale has only an indicative value and should always be interpreted in the context of the other profile scales. Secondly, the IPP30 is highly correlated with the CIPS score ( $r = .78$ ; Ibrahim et al., 2021), but comprises more items. Thus, the CIPS may be the more economical method for studies that are only interested in a total score. In addition, the CIPS is the better-established and better-validated instrument, even though the IPP30 covers additional IP-inherent aspects with the Ambition and Need for Sympathy scales. Thirdly, all studies were conducted using online surveys. This form of data collection in the time of the pandemic restrictions has numerous limitations because background circumstances could not be controlled, even though plausibility checks were used. In addition, participants' demographic data could not be independently verified. Furthermore, incentives were used in the study, such as credit hours for students or a monetary reward for commercial panels. This extrinsic motivation among subjects could have potentially undermined intrinsic motivation and consequently reduced the response quality. Fourth, the study samples had different characteristics. The preliminary study consisted mainly of younger people ranging in age from 18-23 years. In the first study, a

representative age distribution was achieved using a commercial panel, but more women than men participated in the survey. In the second experimental study, the sample consisted mainly of students, limiting the results' generalisability. Fifth, the cross-sectional design of the third study does not allow for conclusions regarding the directions of effects in the path model. Therefore, the LHMIP is only exploratory and requires future longitudinal support.

### **Perspectives and practical applications**

The development of a multidimensional questionnaire to measure Impostor expression has led to numerous research questions and ideas for future development, which we will discuss in this section. First, the IPP30 has been validated and is ready for use in both English and German versions. Our descriptive results allow for a first assessment of subscales and total score expressions. Nevertheless, a comprehensive, gender-specific standardization study is needed in order to be able to interpret and use the IPP30 reliably in a practical context. Future interpretation guidelines, including T-values, percentiles, and stanines, should be formulated based on the standardization study to simplify the instrument's practical use. Furthermore, interpretation guidelines should be formulated for both the subscales and the total score in order to increase accessibility and comprehension of the IPP30. Overall, future work on the IPP30 should also strive to improve the instrument's practical usability for psychotherapists and counselors. Secondly, future research could investigate the IP in samples where it is particularly prevalent. According to Clance (1985), the IP describes very successful people who cannot internalize their successes and therefore feel like Impostors. Thus, future studies should specifically select such very successful people, which was not the case in this dissertation project and is not common in Impostor research in general. For example, a sample of doctoral students, junior professors, or students at renowned universities would align with the constructs' success requirements. Another way to generate a particularly IP-prevalent sample would be to examine individuals based on their past social roles, e.g.,

the best in class. Controlling for this inclusion criterion could contribute to clarifying the divergent findings on the influence of gender or parenting styles.

Third, another very fruitful yet less common research design is the longitudinal study of Impostor feelings. Such a study would be necessary to calculate the retest reliability of the IPP30 and its subscales. In addition, it would be essential for general IP research to examine the course of Impostor feelings over an extended period of time and across different stages of life. This type of research would allow us to determine the influence of contextual changes on the IP and shed more light on the phenomenological quality of the construct. In particular, the transition to new challenges (start of university, new job) is characterized by increased IP expression; adolescence, in which young people try out new self-concepts, could also be characterized by increased IP feelings. Furthermore, a comparative diagnostic tool across educational stages would be a validity criterion for the construct. It is conceivable that people with a high level of the IP develop less academic self-efficacy with the same degree of success in their university studies than people with a lower level of the IP at the beginning of their studies.

Fourthly, the instrument makes it possible to empirically test a typology already formulated in the early work of Harvey and Katz (1985). For example, the IPP total score could be used to analyze and distinguish between different clusters of people with high IP expression. This typology could also be used diagnostically by classifying certain expressions and combinations of expressions as types. A more in-depth investigation of these hypothetical types could identify specific vulnerabilities, behaviors, and intervention options. Therefore, such a typology, which could be identified through the IPP30, would be relevant for research and practice and could be an extension of the IPP30 as a diagnostic interpretation scheme.

Fifthly, another potentially fruitful further development of the IPP30, which is already in progress at the time of this dissertation, would be the construction and validation of an informant assessment questionnaire. Comparing self- and other-perceptions of the IPP30 could help to validate the subscales

of Competence Doubt, Alienation, and Other-Self Divergence. The difference between other- and self-perception is a defining characteristic of the IP. Impostor feelings only match the actual definition of the construct when the persons concerned have a low opinion of themselves and at the same time perceive a very high opinion of themselves by others. In my view, there is an essential research gap with regard to informant assessment, which should be addressed in the future. An external assessment questionnaire could also be important for diagnostics in order to obtain more comprehensive assessments. It would even be conceivable to include such an external assessment in the diagnostic process, with discrepancy between external and self-image established as a diagnostic criterion.

Sixthly, while the IP is predominantly studied quantitatively, qualitative research could contribute to the instrument's validation and examine related intrapsychic conflicts and individual causes of their development. Future projects could also construct a qualitative interview guide and examine the IP from the psychodynamic paradigm, which could expand the existing body of theory and contribute to the development of new hypotheses and possibilities for intervention. Also the In particular, the hypothesis formulated in the LHMIP, with a superstitious control belief that defensive pessimism is an implicit prerequisite for success, could be explored more deeply through qualitative research and retrospection by Impostors.

Seventh, the LHMIP should be critically examined in future research, as the model's exploratory claims should be used only for hypothesis generation. An essential question raised by the model is whether the IP is a form of learned helplessness. The high correlation between the two constructs makes a deeper investigation of this hypothesis intriguing. However, how could highly successful individuals simultaneously be experiencing learned helplessness? One explanation would be that Impostors perceive a non-contingency between achievement and success. They are almost always successful, even when they have a low opinion of their performance. They may therefore think that evaluators are favorably evaluating their performance. As a result, they make an external attribution. However, this explanation of success through benevolence leads to a dependency and could increase the feeling of helplessness.

The lack of contingency between performance and outcome is also a central mechanism in research on learned helplessness, which could also contribute to understanding of the IP.

Finally, I would like to discuss the aspect of psychological research that creates the most value for those affected, the intervention. Initial research on interventions to reduce the IP by Zanchetta et al. (2020) shows that addressing the implicit theory of intelligence (mindset) reduces the IP. It seems to make sense to address related constructs (such as mindset or defensive pessimism) through specific interventions to reduce overall IP expression. At the same time, the IPP30 enables a differentiated assessment at the facet level, so that interventions could target and differentiate individual facet expressions among those affected. Further intervention possibilities could be increasing lighthearted playfulness (seeing life more as a playground), which specifically counteracts core elements of the IP (e.g., perfectionism, low self-esteem, worrying). Possibilities for leaders to reduce the IP in employees and themselves also represents a rich field for future research. The development of an empowering error culture and the enhancement of performance transparency in companies would be conceivable intervention possibilities. Onboarding of new employees could also consider the potential risk of increased Impostor expression when beginning a new job. In particular, training programs for young managers should consider the IP as a field in human resource development. Companies' increasingly agile culture demands that employees make mistakes and quickly learn from them. Working with a minimum viable product (MVP), which is deployed in an unfinished state to gather customer feedback, requires a high tolerance for mistakes and ambiguity. Thus, IP seems to be a particular hindrance in such a work environment due to its inherent perfectionism and fear of failure. Employee development and team development programs within agile companies should therefore also take the IP into account in order to develop the full potential of their employees and profit from synergies. Finally, I would like to highlight the potential use of the multidimensional IPP30 in a therapeutic setting. The IPP30 form allows therapists, psychologists, and counsellors to create an IP-specific profile that can be used as a basis for



further exploration and intervention. In particular, gestalt therapy approaches such as the inner team can be used to address imposter feelings in a targeted way based on the profile.

### **Conclusion**

The development of the Impostor-Profile as a multidimensional questionnaire to measure the IP at the facet level was the core objective of this dissertation project. The four studies yielded an instrument that measures IP expression with six scales and a total score. The psychometric and experimental investigations support the instrument's validity. The instrument's advantages could be shown, for example, by examining gender differences at the facet level. Nevertheless, our aspiration is that the IPP30 will not be used exclusively for research purposes in the future but also in practical settings. We hope that the results of this dissertation contribute to academic knowledge of the IP and ultimately help those affected, the felt Impostors, by leading them to a better understanding of themselves. As is well known, knowledge is the first step towards progress, and the results of the Impostor-Profile could be the first step towards personal progress for imposters: "One day to collect the scattered fragments of myself, and give them symmetry, and wholeness, and use" (Strode, 1912; p. 81).

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## Appendix

### Research articles

In the appendix you will find the research articles that were written as part of this dissertation.

#### **Prestudy**

Ibrahim, F., Münscher, J.-C., & Herzberg, P. Y. (2020). The facets of an impostor–development and validation of the impostor-profile (IPP31) for measuring impostor phenomenon. *Current Psychology*, 1–12.

Journal impact factor (2020): 2.051

#### **Author contributions:**

FI generated the initial idea, carried out the data collection, and analyzed the data. J-CM and PH helped formulate the initial item pool and participated in the expert rounds. FI interpreted the data, with PH providing significant suggestions for improvement. Critical revision was done by PH. The final submission was made by FI. All authors contributed to the article and approved the submitted version.

**Article 1**

Ibrahim, F., Münscher, J.-C., & Herzberg, P. Y. (2021). Examining the Impostor-Profile—Is

There a General Impostor Characteristic? *Frontiers in Psychology, 12*, 720072.

<https://doi.org/10.3389/fpsyg.2021.720072>

Journal impact factor (2021): 2.78

**Author contributions:**

This article was written in joint collaboration. FI had the initial study idea, with PH and J-CM assisting with the final design. FI performed the data collection. FI performed the data analysis in collaboration with J-CM. FI made the data interpretation, with PH providing essential suggestions for improvement. FI prepared the first draft article and improved it through three feedback cycles with improvements from J-CM and PH. Critical revision has been done by PH. The final submission has been done by FI. All authors contributed to the article and approved the submitted version.

**Article 2**

Ibrahim, F., Goeddertz D., & Herzberg, P. Y. (2022). The Experimental Validation of the Non-Self-Serving Attributional Bias in Impostors. [manuscript resubmitted for publication in Current Psychology]

Journal impact factor (2022): 4.297

**Author contributions:**

FI: Writing – Conceptualization, Methodology, Formal Analysis, Investigation, Resources, Writing – Original Draft, Visualization. DG – Conceptualization, Writing, Methodology, Investigation, Review & Editing. PH – Conceptualization, Methodology, Writing – Review & Editing.

**Article 3**

Ibrahim, F., Münscher, J. C., & Herzberg, P. Y. (2022). The validation of the English Impostor-Profile 30 and the exploratory formulation of the learned helplessness model of the impostor phenomenon. *Acta Psychologica*, 226, 103589.

Journal impact factor (2022): 1.734

**Author contributions:**

FI: Writing – Conceptualization, Methodology, Formal Analysis, Investigation, Resources, Writing – Original Draft, Visualization. J-CM– Conceptualization, Writing – Review & Editing. PH – Conceptualization, Methodology, Writing – Review & Editing.