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Short Communication

The Impostor Phenomenon and causal attributions of positive feedback on intelligence tests

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ABSTRACT

The Impostor Phenomenon (IP) is characterized by an external-instable-specific attributional style (i.e., Impostors perceive successful performance as due to chance). To our knowledge no study has yet tested this notion in real-life situations. Therefore, we invited 76 participants to complete computer-based numerical and verbal intelligence tasks, gave them positive feedback, irrespective of their actual performance, and assessed their attributions of the positive performance feedback. While the self-reported IP was unrelated to psychometrically measured intelligence ($rs \leq 0.07$), those high in IP discounted their performance and attributed the cause for their performance as external-instable-specific ($r = 0.40$). The findings hold when controlling for age, gender, and actual performance. Our study extends the knowledge on the associations between the IP and causal attributions of performance. We discuss how addressing attributional styles could benefit interventions for the IP.

The Impostor Phenomeneon (IP; Clance, 1985) describes individual differences in self-perceptions of intellectual fraudulence despite evidence of accomplishment (e.g., grades, recommendation letters, or promotions). Those high in the IP ("Impostors") discount their ability and attribute positive performance outcomes externally to chance and luck (Clance, 1985). The IP relates to lower mental health, anxiety, and depressiveness and is detrimental to job satisfaction, career development, and career planning (e.g., Vergauwe et al., 2015; see Sakulku & Alexander, 2011 for an overview). Numerous studies found the IP to be unrelated from demographics such as age, gender, and vocational group (Sakulku & Alexander, 2011).

While previous studies have examined the IP-related attributional styles mostly in vignette studies, we studied how the IP relates to causal attributions of real-life performance. Therefore, we tested how the IP relates to attributions of positive performance feedback and *actual* psychometrically measured performance in intelligence tasks.

1. Attributional styles

Attributional styles describe individual differences in how people perceive the cause of events along the dimensions of internality, stability, and globality (Peterson et al., 1982). *Internality* describes who/what is responsible for an outcome, ranging from external (e.g., chance/luck) to internal attributions (i.e., person characteristics; e.g., ability), *stability* describes whether a cause is perceived as stable across situations (i.e., expected to happen again) or whether one does not expect this to affect similar future situations (e.g., chance/luck), and *globality* describes whether a cause affects a specific situation (e.g., performance) or generalizes across domains. Attributional styles depend on whether an event is positive (e.g., success) or negative (e.g., failure) and the domain (social vs. performance). Numerous studies have shown that a negative (or depressive) attributional style is characterized by internal-unstable-specific attributions of positive outcomes (i.e., assuming that positive events are based on causes outside the person and depend on chance/luck) and external-stable-global attributions of negative events (i.e., assuming negative events are based on reoccurring features of oneself), whereas the opposite pattern is found in psychologically adjusted people (Weiner, 1985).

Although the relevance of Impostors discounting their ability has been highlighted for decades (e.g., Clance, 1985), few studies addressed attributional styles in IP research. Cozzarelli and Major (1990) assessed the IP and GPA at the beginning of a university semester and studied the attributions after exams in a sample of undergraduates. While Impostors did not differ from non-Impostors in their actual performance and GPA (Cohen's $d = 0.04$), they attributed exam performance externally to chance and low ability (no effect sizes available). Thompson et al. (1998) provided participants with vignettes of success and failure (between-subjects) and found that Impostors reported lower internality,

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stability, and controllability than non-Impostors when evaluating their success (*d*s between 0.39 and 0.49). When using Peterson et al.'s (1982) Attributional Style Questionnaire, that asks participants to evaluate attributions regarding vignettes describing social and performance situations, Brauer and Wolf (2016) found the expected IP-typical attributional style of external-unstable-specific causal attributions in positive performance-related situations, whereas attributions of social events were unrelated to the IP. The findings support the notion that Impostors perceive the cause for their successful performance as external (chance/luck) instead of internal (ability). However, most findings are based on vignette studies while Impostors' attributions in real-life situations are hitherto understudied.

2. The present study

We aimed at extending the knowledge of Impostors' attributions in a real-life context by testing the relationship between the IP and attributions of positive performance feedback as well as objectively measured performance in verbal and numerical intelligence tasks. Based on prior findings on Impostors' attributional styles (Brauer & Wolf, 2016; Thompson et al., 1998), we hypothesized to find the IP-typical attributions after providing positive feedback concerning the performance in the intelligence test. Thus, H1 assumes a negative correlation between the IP and internal-stable-global attributions assessed after providing feedback. In line with prior studies (e.g., Cozzarelli & Major, 1990), we expected no robust association between the IP and objectively measured performance.

3. Method

3.1. Participants and procedure

Our sample comprised 76 university students from different faculties (77.6% females; $M_{age} = 23.4$, $SD = 4.5$ years). The study was advertised as "study on personality and intelligence." When participants signed up for the study, they received a link to the online questionnaire and an appointment for an experimental session in the lab. Participants gave informed consent and were not financially compensated but could earn course credit upon participation. Our sample size allowed to detect medium-to-large effect sizes ($\rho \geq 0.27$) in line with prior research (Thompson et al., 1998) with 80% power and $\alpha = 5\%$.

The online survey (hosted by www.soscisurvey.de) contained demographic questions and the *German-language Clance Impostor Phenomenon Scale* (GCIPS; Brauer & Wolf, 2016) and was completed two days prior to the lab session. In the lab, a trained experimenter explained that this experiment aims at assessing intelligence with a standardized computer test. Participants were seated in front of a 20-inch CRT monitor (1600 × 1200 pixel) and keyboard and were told that they could start the experimental session when ready; we used E-Prime (Schneider & Zuccoloto, 2007) for this part of the study. A textual instruction to the intelligence tasks appeared on-screen and noted that the performance allows deriving conclusions on cognitive abilities.

The intelligence task contained one verbal and one numerical task with items based on the subtests 2 and 11 of Kreuzpointner et al.'s (2013) intelligence test, a standard measure in the German-speaking countries. In the numerical task, participants were presented with 28 nine-digit numbers (one number/trial). For each number, participants were asked to report the sum of digits via the keyboard. In the verbal task, participants were presented with 20 separate word jumbles (one/trial) and were asked to identify the correct word by indicating the first letter of the word via keyboard. After each response a random inter-trial interval between 1000 and 1500 milliseconds preceded the presentation of the following item. If participants did not respond within 30 s after an item was presented, a warning ("Please submit your answer now!") appeared in the upper half of the monitor. The task order was randomized between participants.

After completing each task, participants were presented with on-screen feedback stating independently of their actual performance: "Congratulations!! Very good!!! You have reached X points out of Y possible points. This is a very good result and is achieved by very few subjects." X was a randomly drawn number between 16 and 20 (verbal task) and between 24 and 28 (numerical task) while Y was 28 (numerical task) and 20 (verbal task). Pre-tests have shown that participants could not estimate their actual performance and relied on the on-screen feedback. After the second feedback, participants completed a questionnaire assessing the causal attributions concerning their performance and were then debriefed by the experimenter. On average, the lab sessions took 30 min.

3.2. Instruments

The GCIPS (Brauer & Wolf, 2016; English original by Clance, 1985) contains 20 items (e.g., "It's hard for me to accept compliments or praise about my intelligence or accomplishments") and participants give their responses on a 5-point Likert-type scale (1 = *never*; 5 = *always*). In this study, Cronbach's α was 0.89.

We assessed the attributional style of the positive feedback regarding the intelligence task with the item stems of Peterson et al.'s (1982) Attributional Style Questionnaire. Participants were asked "What main cause do you use to explain why you just performed well/badly?" and then to respond to six items asking for attributions concerning their stated cause. Three subscale scores (internality, stability, and globality) and a total score reflecting internal-stable-global attributions are computed. Each subscale is assessed with two bipolar items and participants respond on 5-point bipolar rating scales. An example item for *Internality* is "has something to do with the circumstances"—"has something to do with me" (see ESM for the verbatim instruction and items). The reliability was satisfying when considering the low number of items, with $\alpha = 0.91, 0.91, 0.84$ for the internality, globality, and total scores, whereas the two stability items showed minor overlap (0.25). A confirmatory factor analysis supported the 3-dimensional model of the items ($\chi^2[6] = 9.04$, $p = .171$; RMSEA = 0.080, CFI = 0.985, TLI = 0.962).

4. Results

The GCIPS scores ($M = 54.9$, $SD = 11.7$; min/max = 33.0/78.0) were comparable to prior studies in German-speaking samples (Brauer & Wolf, 2016). The distribution of the GCIPS scores did not deviate from the normal distribution (Skewness: 0.11, Kurtosis: −0.81; Shapiro-Wilk test: $W = 0.98$, $p = .285$). On average, participants performed well in the intelligence tests, solving 80.7% (numerical) and 90.1% (verbal) of the tasks correctly. Independently from the manipulated feedback, 52.5% (numerical) and 96.1% (verbal) of the participants reached the positive results communicated in the feedback.

As expected, the IP was unrelated to actual ability in terms of correct responses ($r = -0.07$, $p = .533$) and reaction times ($r = -0.03$, $p = .771$) in the intelligence task, whereas internal attributions related to faster reactions ($r = -0.26$, $p = .010$) and higher accuracy ($r = 0.23$, $p = .022$). As hypothesized, higher IP related to less internal-stable-global attributions of positive performance ($r = -0.40$, $p < .001$; correlations with the dimensions were $r = -0.21$ [internality], −0.41 [stability], and −0.40 [globality], $ps \leq .035$). Controlling for age, gender, and actual performance did not alter the findings ($\Delta r \leq 0.02$) and interpretations.

5. Discussion

Our study expands prior research on the associations between the IP and attributional styles (Brauer & Wolf, 2016; Thompson et al., 1998) by investigating causal attributions in a naturalistic context (i.e., measuring intelligence). As expected, the IP was unrelated to actual performance, but Impostors discounted their success and attributed their performance

to chance and luck (external-unstable-specific attributional style), with comparable effect sizes to prior experimental research (Cozzarelli & Major, 1990; Thompson et al., 1998). Our findings highlight, again, the importance of attributional styles for the IP and support Clance's (1985) theoretical notions on Impostors' perceptions of their performance, particularly inclinations to dismiss internal causes of their positive performance.

Attributional styles are potent predictors of depression and low mental health (Peterson et al., 1982; Weiner, 1985) and Impostors' attributional styles, although being particularly dominant in performance-related situations, might contribute to understand why the IP is related to experiences of depressiveness, anxiety, and low well-being (Sakulku & Alexander, 2011; Vergauwe et al., 2015). Considering the importance of attributions for the IP, our findings encourage future research that examines whether interventions addressing changes in attributional styles affect the IP. Proudfoot et al.'s (2009) 7-week cognitive-behavioral intervention to train attributional styles provided promising results since changes in attributional styles did go along with improved self-esteem, job satisfaction, and well-being. Addressing the attributional styles of Impostors with Proudfoot et al.'s training program might supplement Zanchetta et al.'s (2020) coaching intervention that reduced the IP, with effects being assessed and observable five weeks post-intervention. Also, the design we introduced in this study might be used to examine the effectiveness of such trainings beyond self-reports.

The generalizability of our findings is limited as we tested only German-speaking undergraduates; also taking range restrictions in intelligence into account. A replication and extension to testing more heterogeneous samples regarding professional status (employees show lower mean-levels in the IP than undergraduate samples; e.g., Brauer & Proyer, 2017) and gender ratio is desirable. Although the sample size is suited to detect the effect sizes expected from the literature, (meta-) analyzing findings from independent samples should extend the generalizability. Also, we have only tested attributions regarding good performance. Future research should additionally examine attributions to poor performance in relation to the IP in naturalistic settings. Using alternative operationalizations of performance-related or high-stakes situations (e.g., role-play of job application), ability measures (e.g., creativity), and additional outcomes (e.g., satisfaction with the performance) could extend the knowledge on how Impostors experience their performance. In addition, the effects of theoretically near variables should be tested. For example, the IP is characterized by low self-efficacy (Brauer & Wolf, 2016) and considering the differential contributions of attributional styles and self-efficacy to predict objective indicators of performance (e.g., Hamann et al., 2021), we recommend extending research of factors that can explain how Impostors perceive and deal with performance situations. Finally, testing the discrepancies between actual and perceived ability in association with the IP could clarify the magnitude of Impostors' misperceptions of their performance.

CRediT authorship contribution statement

Study conceptualization, data collection, and data analysis: KB; Report writing, reviewing, and editing: KB and RP.

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Open data

Data, materials, and syntaxes are openly available in the Open Science Framework under https://osf.io/dj4bg/.

Declaration of competing interest

The authors do not declare any conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2022.111663.

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