Replication Study

I still cannot see it – A replication of blind spots in self-perception

Anne-Marie B. Gallrein [a,*], Nele M. Weßels [a], Erika N. Carlson [b], Daniel Leising [a]

[a] TU Dresden, Department of Psychology, Professur für Diagnostik und Intervention [Chair of Diagnostic and Intervention], 01062 Dresden, Germany
[b] Department of Psychology, University of Toronto Mississauga, 3359 Mississauga Rd, Mississauga, ON L5L 1C6, Canada

A R T I C L E   I N F O

A B S T R A C T

Gallrein, Carlson, Holstein, and Leising (2013) tested a novel form of so called "blind spots" as conceived in the social reality paradigm that contrasts self- *and* metaperception with one's reputation (i.e., the *consensual* impression one makes). They found that people are not always aware of the unique views that others have of them, providing evidence for *distinctive blind spots in self-perception.* The current research replicates this finding and the original effect size using a larger set of personality ratings (Study 1), a more diverse set of informants (Study 1) and two different cultures (Study 1 vs. Study 2). This replication suggests that the blind spot phenomenon is robust across item sets, participant samples, and language communities.

1. Introduction

People tend to believe that they know themselves better than other people know them (Vazire & Mehl, 2008). Indeed, the self has "privileged access" to feelings, motives, and thoughts, and people are able – in principle – to observe their own behavior in all situations (Hofstee, 1994; Vazire, 2010). Nevertheless, research has also demonstrated substantial limits to self-knowledge in a wide range of domains (e.g., overestimation of performance; Dunning, Heath, & Suls, 2004). Furthermore, a growing body of research shows that the impressions *others* have of an individual's personality can provide valuable information above and beyond the individual's self-perception (Connelly & Ones, 2010; Vazire & Mehl, 2008), suggesting others sometimes know things the self does not know or will not tell.

Gallrein, Carlson, Holstein, and Leising (2013) investigated the existence of so-called "blind spots"; that is, features of targets' personalities that others are aware of, but which are oblivious to the targets themselves (Luft & Ingham, 1955). Similar to past work using a social reality approach to self-knowledge, the authors used the consensual impressions of knowledgeable others (i.e., informants) as a way to measure what a person is really like (Hofstee, 1994; Kenny, 2004). Given this accuracy criterion, "social reality blind spots" refer to aspects of people's personalities that others

consensually perceive but that the self does not report. However, going beyond previous research (Leising, Erbs, & Fritz, 2010), Gallrein et al. (2013) conceptualized self-perceptions as targets' perceptions of their own personality as well as targets' *generalized metaperceptions,* or their beliefs about how other people generally perceive their personality (Carlson & Kenny, 2012; Kenny, 1994). Thus, blind spots refer to the characteristics that others consensually attribute to a person that the person does not attribute to him/herself (i.e., self-perceptions) or to his/her reputation (i.e., general metaperceptions).

Gallrein et al. (2013) found evidence for the existence of such blind spots using a person-centered approach, which essentially indexes self-knowledge as the degree to which people perceive their own characteristic pattern of traits (i.e., self-perceptions and metaperceptions) as being similar to how others describe that pattern (e.g., more outgoing than kind or responsible). Thus, the social reality blind spot is measured as a pattern of traits that others – and only others – *consensually* attribute to a target. Going further, Gallrein et al. (2013) identified two forms of blind spots. The first is the *distinctive blind spot* which is the pattern of traits that informants – and only informants – consensually attribute to *particular* targets. The average profile correlation expressing the level of agreement between informants in that regard was $r = .26$. The second is the *normative blind spot,* which is the personality pattern that informants – and only informants – attribute to the *average* target. This normative profile correlates strongly with the rated social desirability of traits, suggesting that typical informants tend to attribute more positive personality characteristics to

* Corresponding author.
   E-mail addresses: anne.gallrein@tu-dresden.de (A.-M.B. Gallrein), nele.wessels@tu-dresden.de (N.M. Weßels), erikan.carlson@utoronto.ca (E.N. Carlson), daniel.leising@tu-dresden.de (D. Leising).

targets that targets fail to attribute to them themselves (cf. Leising et al., 2010).

Given the increased interest in replication in the field of personality and social psychology (Asendorpf et al., 2013; Nosek, Spies, & Motyl, 2012; Pashler & Wagenmakers, 2012), we present two studies aiming to replicate the previous findings. We believe that a replication of the blind spot is important given the growing literature on the adaptiveness of self-knowledge (e.g., Tenney, Vazire, & Mehl, 2013; Ward & Brenner, 2006). Indeed, people's reputations likely affect how they are treated by others (e.g., when Tina has a reputation of being "arrogant" and thus others avoid her; cf. Leising & Müller-Plath, 2009), and poor insight into social reality makes it difficult for people to effectively navigate their social environment (e.g., modify problematic behaviors). Thus, a replication of the existence of this blind spot will hopefully encourage future work that explores outcomes of poor self-knowledge or interventions designed it shed light on these blind spots.

In addition to replicating the original effect, the current studies also provide a number of important extensions. First, Study 1 employs a larger and more diverse set of personality items and, second, a more sophisticated strategy for recruiting informants. Unlike most research where targets recruit or nominate their own informants, or "target-nominated informants" (TNI), we recruited informants in a classroom setting. This is important as TNI tend to hold extremely positive views of targets (Leising, Gallrein, & Dufner, 2014; Leising et al., 2010) and informants who like their targets tend to perceive targets in normative ways, or ways that reflect the typical person's personality (i.e., Leising, Ostrovski, & Zimmermann, 2013; Leising et al., 2010). The reliance on TNI in the original research likely underestimated the blind spot effect due to variance restriction, a hypothesis tested in the current work. Third, given that the original effect was only observed in a German sample, Study 2 investigates the blind spot in a large sample from the US to demonstrate the generalizability of the effect across cultures and languages.

2. Study 1

The main goal of Study 1 was to replicate Gallrein et al.' (2013) findings using a larger and more diverse set of personality items and a more diverse sample of informants. While Gallrein et al. (2013) used 37 self-generated items to measure the Big Five (Goldberg, 1993), the current study included 107-items that measured: (a) the Big Five, (b) self-esteem, (c) interpersonal style, (d) personality pathology, and (e) person-descriptive adjectives from the natural language. As in the original research, targets nominated three informants (TNI), but the experimenters also nominated six additional informants from the targets' university classes. Given that classmates have little choice but to interact with – and thus get to know – each other, university classes likely represent an environment where informants *know*, but do not necessarily *like* each other (Oltmanns & Turkheimer, 2006). For each target, we took care to recruit classmates who reported liking the target (CM+), but also classmates who reported not liking the target too much (CM−).

2.1. Method

2.1.1. Sample

Participants were recruited in large classes at a university in the East of Germany. Initially, 85 seminar groups comprising at least eight students willing to participate were recruited. For each seminar we selected one person as the target. The target was asked to complete an online personality questionnaire. We also selected six classmates as informants for each target. These informants were asked to also evaluate their respective target using the same personality questionnaire. For a seminar group to be included in the study, at least three classmates had to report liking their respective target (CM+), and three had to report not liking their respective target too much (CM−). The complete assignment algorithm is described below.

Out of the 85 targets we initially identified, 73 (female = 38; age: $M = 23.19$, $SD = 3.45$) completed the questionnaire and had at least one CM+ and one CM−. The targets were well-educated, with 51 (69.9%) reporting having "Abitur" (comparable to A-level exams). Across all seminars, 400 classmates were recruited as informants. Two informants were excluded due to missing data leaving 200 CM− (female = 135, sex not reported = 1; age: $M = 23.66$, $SD = 4.22$) and 198 CM+ (female = 133, sex not reported = 4; age: $M = 23.44$, $SD = 4.39$, not reported = 2). On average each target had $M = 2.75$ ($SD = 0.49$) CM− and $M = 2.73$ ($SD = 0.48$) CM+. Classmates were also well-educated, with 125 CM− (62.50%) and 126 CM+ (63.6%) reporting having Abitur. Most informants described themselves as "friends" ($n_{CM−} = 4$, $n_{CM+} = 74$), "acquaintances" ($n_{CM−} = 39$, $n_{CM+} = 56$) or just "classmates" ($n_{CM−} = 195$, $n_{CM+} = 185$) of the targets. Additionally, we asked the targets to recruit three informants from their own personal social networks (TNI). These informants were also asked to describe their respective target using the same personality online questionnaire. Fifty-six of the targets recruited an additional 147 TNI (female = 78, sex not reported = 10; age: $M = 30.14$, $SD = 12.73$), with an average of $M = 2.01$ ($SD = 1.24$) TNI per target. Seventy-four TNI (50.3%) reported having Abitur. Most TNI described themselves as "friends" ($n = 75$) of the targets, followed by "family members" ($n = 45$), "classmates" ($n = 24$), "romantic partners" ($n = 18$) and "acquaintances" ($n = 13$).

2.1.2. Procedure

Participants were recruited in two phases. In phase 1, a research assistant briefly advertised the project in university seminars and collected email addresses of students interested in participating. These students received an email containing a link to a short sociometric online questionnaire in which they were asked to report how much they liked and how well they thought they knew each of their classmates. For completing this stage of the study, participants were reimbursed with either 5 € or 0.5 h of course credit. Based on the levels of liking and knowing assessed during the first stage, we then assigned one target and six informants per class. To avoid statistical non-independence, we chose only one target per class. A student was declared a target when at least three of his/her classmates reported not liking that student very much (i.e., mean liking for each informant <3 on a scale from 1 [*not at all*] to 5 [*very much*]) *and* when three other classmates reported liking the same student at least somewhat (i.e., mean liking for each informant >3 on a scale from 1 [*not at all*] to 5 [*very much*]). Thus, to qualify as a target, a student needed to be liked by at least three classmates and to be disliked by at least three other classmates. If a potential target was liked and disliked, respectively, by more than three potential class informants, we chose those classmates as informants who reported knowing the target best.

In the second phase, targets and informants received an email informing them that they had been selected for continued participation. Targets were asked to provide more detailed self-perceptions and metaperceptions, using a different online questionnaire, and informants were asked to describe the personality of their respective targets using the online informants' questionnaire. Targets were also asked to recruit three TNI from their personal social networks via email. For this purpose, we provided the targets with pre-formulated emails that they only had to forward to their respective TNI. The TNI also described the targets' personalities using the online informants' questionnaire. After completing

the second stage successfully, targets and classmate informants were compensated with an additional 1 hour of course credit or 10 €.

2.2. Measures

2.2.1. Personality ratings

The following personality ratings were measured during the second phase of Study 1. The response scale for all items ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Targets were asked to report (a) how they see themselves (i.e., self-perception; "I am a person who is …") and (b) how they think *others* would evaluate them on the same items (i.e., general metaperception; "Others think I am a person who is …"). The sequence in which self-perceptions and metaperceptions were assessed was randomized. Informants (CM+, CM−, TNI) were asked to rate their respective target on the same items (i.e., other-perception; "This is a person who is …"). These three different perspectives on the same targets' personalities were used to calculate blind spot profiles for each target later on (see below).

The item pool comprised 107 items, including: (a) the German version of the Big Five Inventory 10 (BFI-10; "… is reserved"; Rammstedt & John, 2007), (b) a 30-item adjective list compiled by Borkenau and Ostendorf (1998; e.g., "industrious") as additional markers of the Big Five, (c) the 10-item German version of the Rosenberg Self-Esteem Scale (e.g., "I feel that I have a number of good qualities"; Rosenberg, 1965; von Collani & Herzberg, 2003) and two additional self-esteem items ("I like myself a lot", "I am critical of myself"), (d) a 16-item (e.g., "shy", two per scale) short version of the German Interpersonal Adjective List (IAL; Jacobs & Scholl, 2005), which is based on the interpersonal circumplex model of personality (Kiesler, 1983; Leary, 1957; Wiggins, 1979), (e) 25 items designed to measure more "extreme" aspects of personality or personality pathology (e.g., "gets mad at others easily"), and (f) a 14-item list of person-descriptive adjectives from the natural language (e.g., "attractive") that were not included in the scales mentioned above but measured in past work (Leising, Ostrovski, & Borkenau, 2012). All items were presented in separate blocks comprising approximately 10–15 items per screen. A block always comprised items of the same measure (e.g., block A = IAL, block B = BFI-10). Measures comprising more than 16 items were divided into two blocks. To balance possible effects of priming, fatigue, or boredom, the order of items was randomized within each block. Blocks were presented in randomized orders as well.

2.2.2. Liking and knowing

Informants used eight items to report how much they liked their respective target (e.g., "I like ___ very much", four items) and how well they thought they knew the target (e.g., "I know ___ very well", four items), on a 5-point rating scale (1 = *not at all* to 5 = *very much/very well*). The reliability of both scales, assessed across all informants, was sufficient with α = .84 (M = 13.55, SD = 4.16) and α = .92 (M = 13.22, SD = 4.59) for liking and knowing, respectively. TNI reported liking and knowing using the informants' questionnaire during the second phase of the study; classmates reported liking and knowing using the same informants' questionnaire during the second phase, and the sociometric questionnaire during the first phase of the study. Note that the statistical significance of following effects was tested by computing 95% bootstrap confidence intervals (1000 resamplings). Liking a particular target at phase one strongly predicted liking the same target at phase two (r = .77, 95% CI [.69,.83]). Ratings of knowing also showed similar significant stability across the two measurements (r = .77, 95% CI [.69,.82]). For all subsequent analyses of group differences, we used the informants' first ratings of liking and knowing. The liking means differed significantly between the three

informant groups (M_{CM-} = 2.18, 95% CI [2.07,2.27] vs M_{CM+} = 3.92, 95% CI [3.82,4.02] vs M_{TNI} = 4.45, 95% CI [4.33,4.57]). The knowing means also differed significantly from each other (M_{CM-} = 2.47, 95% CI [2.31,2.64] vs M_{CM+} = 3.70, 95% CI [3.55,3.85] vs M_{TNI} = 4.49, 95% CI [4.37,4.60]). Furthermore, liking and knowing were significantly correlated across all informants with r = .74, 95% CI [.66,.80].

2.3. Data analysis[1]

We adopted a *person-centered approach*, which focuses on the extent to which perceivers (e.g., the self and others) agree in judging a target's personality profile, or the target's characteristic pattern of traits (Furr, 2008). This enables an integrative analysis of large amounts of information about an individual, and is statistically more powerful (i.e., requires fewer participants to achieve the same certainty of inference) as compared to analyses concentrating on single traits (Borkenau & Zaltauskas, 2009).

Recall that a blind spot in self-perception in the current context refers to the extent to which others agree in attributing personality patterns to targets that those targets are not aware of Gallrein et al. (2013). For example, Tina's blind spot includes the characteristic pattern of traits that others consensually ascribe to her (e.g., other people agree that she is more arrogant than friendly and kind) but that Tina does not attribute to herself (i.e., she does not describe her personality in this way) or to her reputation (i.e., she does not expect others to describe her in this way). However, to compute blind spot indices, the raw personality profiles (i.e., informants' perceptions, targets' self- and meta-perceptions on the 107 items) were decomposed into a normative and a distinctive component (Borkenau & Zaltauskas, 2009; Cronbach, 1955; Furr, 2008). The *normative component* of a raw profile represents the average profile across raters (e.g., how the typical person describes him- or herself). Note that there is only one normative profile for any given perceiver group (i.e., one normative self-perception profile). The normative profile tends to be socially desirable, whereas personality traits not attributed to the average person are often undesirable or neutral (Edwards, 1953; Wood & Furr, 2015). The *distinctive component* of a raw profile comprises the *deviations* of the raw profile from the normative profile (e.g., how a person perceives him- or herself differently from the typical person; Furr, 2008). In other words, the distinctive profile reflects the ways in which a person's description is *unique*. Usually, distinctive profiles are derived by computing simple differences between raw profiles and the normative profile (Borkenau & Zaltauskas, 2009; Furr, 2008). However, in line with Gallrein et al.'s approach (2013), we used linear regression to adapt profile decomposition accordingly; specifically, we calculated distinctive profiles by saving the residuals when *regressing* raw profiles on the respective normative profile. Gallrein et al. (2013) demonstrated that this approach leads to results very similar to those of the more traditional procedure.

In addition to assessing blind spots, we also assessed (a) consensus, or the extent to which informants agreed in their judgments of the targets' personality patterns; (b) self-other agreement, or the extent to which informant ratings agreed with their respective targets' self-perceptions; (c) general meta-accuracy, or the extent to which targets knew how their personality patterns were perceived by their informants; and (d) meta-insight, or the extent to which the targets knew how their personality patterns were perceived by others, above and beyond how they saw themselves. General meta-accuracy was assessed as the average profile correlation between other-perceptions and the respective targets' general meta-perception (i.e., the single

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[1] Detailed descriptions of the data analyses are also presented in Gallrein et al. (2013).

general meta-perception profile was correlated individually with each informant-impression profile). Meta-insight was assessed as the average semi-partial profile correlation between meta-perception and other-perceptions, controlling for the shared variance between meta- and self-perceptions (Carlson, Vazire, & Furr, 2011).

For all types of agreement, we computed *average pairwise profile correlations* (John & Robins, 1993). We first correlated each possible pair of descriptions (e.g., the self and a particular informant, or two particular informants), using the items as "cases". For each type of agreement (e.g., self-other agreement), all pairwise correlations were averaged within targets (e.g., all of a target's correlations between self- and informant-rating profiles were averaged). This prevents unfair comparisons between different types of agreement (e.g., self-other agreement versus consensus) given that there were more informant-ratings than self- or meta-ratings for each target. Finally, correlations were averaged across targets to obtain an estimate of the overall effect size. Before averaging, correlations were subjected to Fisher's r-to-Z transformation, and averaged Z coefficients were back-transformed to correlations.

To index *normative* and *distinctive* blind spot profiles, we first computed *raw residual profiles* for each target by simultaneously regressing each informant-rated profile on the self- and meta-perception profiles of the respective target. For example, we regressed Ian's, Irene's, and Isaac's perception of Tina on Tina's self-perception and general meta-perception. The residuals from these models were saved and represent the patterns of personality traits that the individual informants attributed to the target that the target did not attribute to himself/herself or to his/her reputation. This procedure resulted in three to nine raw residual profiles per target (i.e., one for each informant). These raw residual profiles were averaged within targets (e.g., Tina) across informants (e.g., Ian, Irene, and Isaac), creating a *raw blind spot profile* for each target. Such a profile comprises the pattern of characteristics that, for example, Ian, Irene, and Isaac *consensually* attribute to Tina that Tina did not attribute to herself or to her reputation. This procedure led to one raw blind spot profile for each individual target (i.e., $N = 73$ raw blind spot profiles).

Given that the raw blind spot profiles might contain normative information, or characteristics attributed to the average person rather than the particular target, we computed a *normative blind spot profile,* by averaging the 73 raw blind spot profiles across targets. The normative blind spot profile reflects *only* those characteristics that were attributed to the average target by the average informant, but not by the targets. Put another way, this is the impression that the typical person is not aware of making. Note that there is one normative blind spot profile across *all* informants. We then used the normative blind spot profile to compute *distinctive residual profiles* for each informant's rating of his or her respective targets. To do so, we regressed each informant's raw residual profile on the normative blind spot profile. For example, Ian's, Irene's, and Isaac's raw residual profiles (in rating Tina) were regressed on the normative blind spot profile, resulting in Ian's, Irene's, and Isaac's *distinctive residual profiles*. Irene's distinctive residual profile comprises the set of characteristics that Irene, but not Tina, attributes to Tina, as distinguished from the set of characteristics that any perceiver, but not the target, attributes to the average target. By averaging across Ian's, Irene's, and Isaac's distinctive residual profiles, we obtained Tina's *distinctive blind spot profile*. It captures the *unique* pattern of blind spot characteristics that Ian, Irene, and Isaac *consensually* attribute to Tina while she does not attribute this pattern of characteristics to herself or to her reputation.

The most important measure in the present study is the agreement between different informants regarding their target's distinctive blind spot profile. The average pairwise *distinctive blind spot correlation* between Ian's, Irene's, and Isaac's distinctive residual profiles reflects the extent to which they consensually attribute some personality pattern to Tina that Tina is not aware of, and that distinguishes her from the average target. If this correlation differs significantly from zero, it may be concluded that blind spots, as defined by Gallrein et al. (2013), do indeed exist. We tested the statistical significance of this effect, and all other effects, by computing 95% bootstrap confidence intervals (1000 resamplings). This also allowed us to directly compare the sizes of the different effects: Two averaged correlations (e.g., x and y) were considered significantly different when neither x was included in the 95% confidence interval of y nor y was included in the 95% confidence interval of x.

2.4. Results

2.4.1. Profile agreement between self-, other- and, metaperception

Informants agreed about their targets' personalities (consensus: average pairwise $r = .55$, 95% CI [.52,.57]), and targets tended to agree with informants about their own personalities (average pairwise self-other agreement $r = .51$, 95% CI [.48,.55]). Replicating past work (Carlson et al., 2011), targets strongly believed others perceived them as they perceived themselves (self- and metaperception average pairwise $r = .76$, 95% CI [.72,.79]), but targets also understood how informants perceived them (meta-accuracy: average pairwise $r = .56$, 95% CI [.53,.59]) and how informants perceived them differently from how they perceive themselves (meta-insight: average pairwise $r = .25$, 95% CI [.22,.28]). These effects are comparable to the average pairwise correlations reported in the original study (Gallrein et al., 2013; consensus: average pairwise $r = .64$, self-other-agreement: average pairwise $r = .59$, self-meta-agreement: average pairwise $r = .71$, general meta-accuracy: average pairwise $r = .55$, meta-insight: average pairwise $r = .18$).

2.4.2. Profile agreement on blind spot characteristics

The average level of pairwise agreement between *raw residual profiles* (profiles attributed to the same target by different perceivers, controlling for the target's self- and metaperception) varied substantially across targets (range: $r_{min} = .09$ to $r_{max} = .59$), but when averaged across targets, the pairwise correlation was significant (average pairwise $r = .32$, 95% CI [.30,.35]). This suggests that informants from different contexts and with different attitudes towards their targets agreed in judging the targets, but the targets were unaware of some of these shared judgments. As reported in Gallrein et al. (2013), the normative blind spot profile correlated strongly with the social desirabilities of the items ($r = .88$, 95% CI [.83,.91]). This indicates that the shared impression that only the informants, but not the targets, had of the targets were very positive, on average.

The average pairwise agreement between distinctive residual profiles (raw residual profiles controlled for the normative blind spot profile) varied considerably across targets (range: $r_{min} = .06$ to $r_{min} = .45$), but when averaged across targets, it was significant (average pairwise $r = .23$, 95% CI [.21, .24]). This suggests that the targets were oblivious to some of the personality attributes that their informants attributed to them in particular. Thus, Study 1 replicated the existence of the blind spot, as conceptualized in the social reality paradigm. As in the previous study, the targets' distinctive blind spot profiles were not related to the social desirabilities of the items (average $r = .01$, 95% CI [−.02,.03]).

These results did not change when separating the three different informant groups from each another (see Table 1). As shown, the average agreement regarding raw blind spot profiles, as well as the average agreement regarding distinctive blind spot profiles remained significant. Within, and even across, the different infor-

Table 1
Average pairwise agreement regarding raw and distinctive blind spot profiles within and across informant groups.

	CM−	CM+	TNI
Raw residual profiles			
CM−	.32 [.28,.35][d]	.32 [.29,.35][b]	.23 [.19,.26][c]
CM+		.39 [.35,.43][a]	.34 [.31,.38][c]
TNI			.38 [.33,.43][e]
Distinctive residual profiles			
CM−	.23 [.20,.26][d]	.23 [.21,.25][b]	.16 [.15,.19][c]
CM+		.28 [.25,.31][a]	.23 [.20,.25][c]
TNI			.26 [.22,.29][e]

Note. CM− = classmates with mean liking for each informant <3 on a scale from 1 (not at all) to 5 (very much). CM+ = classmates with mean liking for each informant >3 on a scale from 1 (not at all) to 5 (very much). TNI = Target nominated informants. In brackets we report the 95% confidence interval based on 1000 bootstrap resamplings.

[a] $n = 72$.
[b] $n = 73$.
[c] $n = 56$.
[d] $n = 71$.
[e] $n = 52$.

mant groups, informants shared some unique views of their respective targets without the targets being aware of those views.[2]

3. Study 2

The main goal of Study 2 was to replicate findings in another language (i.e., English) and culture (i.e., the US) to rule out the possibility that social reality blind spots in self-perception are simply a German phenomenon.

3.1. Method

3.1.1. Sample

Participants were undergraduate students at a Midwestern US university ($N = 216$; female = 145; age: $M = 20.19$, $SD = 2.58$). Each participant nominated up to eight informants from different contexts by providing email addresses for each person: two college friends, two hometown friends, one sibling, one roommate, one romantic partner and one ex-partner. Only participants with at least 3 responding informants were included in the analyses presented here. Thus, the final sample comprised $N = 129$ target participants (female = 92; age: $M = 19.98$, $SD = 1.54$). The ethnicity of these targets was: 62.8% White/Caucasian/Anglo, 23.3% Asian, 8.5% African American/ Black, 3.9% Hispanic, 0.8% Mixed. 0.8% did not report their ethnicity. In total $N = 545$ informants (female = 363, sex not reported = 2; age: $M = 20.20$, $SD = 1.93$) responded and rated the personality of their respective target on an online personality questionnaire. This led, on average, to $M = 4.22$ ($SD = 1.15$) informants per target.

3.1.2. Procedure

As part of a larger study, participants provided self-reports on the personality measures described below. They also provided an e-mail address for each of their informants. Using these e-mail addresses, the informants received an invitation, stating that they

had been nominated by the respective target as someone who could describe the target's personality. The e-mail also stated that the target had agreed to be described by that informant, and included a direct link to an online personality questionnaire.

3.2. Measure

3.2.1. Personality ratings

The target's global self-perceptions (i.e., "How do you see yourself?") and generalized meta-perception ratings (i.e., "How do people who know you well see you?") as well as the informants' actual impressions of the targets ("How do you see Person X?") were measured with the Ten-Item Personality Inventory (TIPI; e.g., "extraverted, enthusiastic"; Gosling, Rentfrow, & Swann, 2003) and 19 additional items assessing characteristics that are not included in the TIPI (e.g., arrogant, funny, honest). All attributes were rated on a Likert scale ranging from 1 (*disagree strongly*) to 15 (*agree strongly*).

3.2.2. Liking and knowing

Informants reported how much they liked ("I like ___ very much") and how well they thought they knew their respective target ("I know ___ very well"), using a 15-point rating scale (1 = *not at all* to 15 = *very much/well*). On average, informants reported liking their respective target very much ($M = 9.38$, $SD = 3.89$) and knowing their respective target rather well ($M = 8.53$, $SD = 3.66$). Across all informants liking and knowing correlated significantly ($r = .47$, 95% CI [.38,.56]).

3.3. Data analysis

The computation of consensus, self-other agreement, meta-accuracy, meta-insight, and blind spot profiles were the same as in Study 1.

3.4. Results

3.4.1. Profile agreement between self-, other- and metaperception

Informants agreed about their respective targets (consensus: average pairwise $r = .64$, 95% CI [.61,.67]), and targets agreed with their informants (self-other agreement: average pairwise $r = .58$, 95% CI [.54,.61]). While self- and metaperception where highly related (average pairwise $r = .82$, 95% CI [.80,.84]), suggesting targets assumed others would see them as they saw themselves, targets were largely aware of how they were seen by others (general meta-accuracy: average pairwise $r = .61$, 95% CI [.57,.64]), and were aware of how their self-perceptions differed from how they were perceived by others (meta-insight: average pairwise $r = .23$, 95% CI [.20,.25]),. The levels of agreement we found between the different perspectives were similar to the ones reported in Study 1, and in the original study by Gallrein et al. (2013).

3.4.2. Profile agreement on blind spot characteristics

As in Study 1, the average pairwise agreement between *raw residual profiles* varied substantially across targets (range: $r = -.07$ to $r = .80$), but the average level of agreement across targets was significantly different from zero (average pairwise $r = .40$, 95% CI [.37,.44]). After computing the normative blind spot profile, we were able to control for the normative component again. The average pairwise agreement between *distinctive residual profiles* varied also substantially across targets (range: $r = -.13$ to $r = .73$), but the average level of agreement across targets was again significantly different from zero with $r = .29$, 95% CI [.26,.32], suggesting our attempt at replicating the existence of social reality blind spots across languages and cultures was successful.

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[2] For these analysis we derived a normative blind spot profile for each informant group (CM−, CM+, TNI). For example, the normative blind spot profile of the CM− group reflects *only* those characteristics that were attributed to the average target by the average classmate who did not like his/her target, but not by the targets. More details on how to derive the normative and distinctive profiles for each group are provided upon request from the first author. Consistent with the results across all informants, each informant group's normative blind spot profile correlated significantly with the social desirability of the items (range: $r_{min} = .66$, 95% CI [.56,.74] to $r_{max} = .91$, 95% CI [.88,.94]), whereas the distinctive blind spot profiles, derived in each group, were on average evaluatively neutral (range: $r_{min} = -.01$, 95% CI [−.06,.05] to $r_{max} = .01$, 95% CI [−.02,.04]).

4. General discussion

In their original study, Gallrein et al. (2013) investigated the existence of social reality blind spots, or the degree to which people's beliefs about themselves and their reputation diverge from the consensual impressions they made on others. While Gallrein et al. (2013) found that people agreed with others about their personality (i.e., self-other agreement) and realized how they were seen by others (i.e., meta-accuracy and meta-insight), results also suggested the existence of *distinctive blind spots in self-perception* as conceived in the social reality paradigm. That is, that people were oblivious to some of the unique ways in which they were consensually perceived by their informants. The authors also found evidence for *a normative blind spot in self-perception*, or a pattern of traits that informants ascribe to the average target, without targets being aware of it. This pattern of traits was highly desirable, suggesting that the average person is at least partly unaware of how positively he/she tends to be seen by others.

In Study 1, we replicated these findings using a larger and more diverse set of personality items, and a more diverse set of informants – specifically informants who were not recruited by the targets. In Study 2, we replicated the findings in another language (English) and culture (the US). Interestingly, our expectation that blind spot correlations would increase in samples of informants who were not recruited by the targets (Study 1) was not confirmed. The effects sizes in both studies were similar to each other and to those obtained in the original study. Thus, the social reality blind spot seems to be a robust phenomenon, observed across different item sets, participant samples, and language communities. Taken together, the current findings provide further support for Gallrein et al.'s (2013) conclusion that "the typical person is not aware of some of the unique ways in which he or she is consensually perceived by others" (p. 469).

To emphasize the generalizability and robustness of the social reality blind spot, we computed the overall effect size across all known studies to date. To do so, we combined the observations from the original study ($n = 65$) with those from the current research ($n_{Study\ 1} = 73$; $n_{Study\ 2} = 129$; Total $N = 267$). The average pairwise agreement between informants regarding the targets' *distinctive* blind spot profiles was significant ($r = .26$, 95% CI [.25,.28]), and the narrow confidence interval suggests that the estimate was quite precise. The individual observations (blind spots for a given target) probably varied in reliability given that profiles were based on a different number of items in the three studies. Nevertheless, the reported effect sizes of the distinctive blind spot correlations were similar across all three studies regardless of potentially varying reliability.

Our replication had many strengths, but there are some potential limitations. In Study 1, we selected targets based on how much they were liked (and known) by their potential informants. As we selected targets who were disliked by at least some other informants, our resulting sample of targets may have included a disproportionate number of more "unlikeable" targets. To rule out this possibility, we compared the 73 targets who were actually selected ($M = 2.98$, $SD = 0.29$) to the other 636 persons who might have become targets ($M = 3.12$, $SD = 0.52$) in terms of how much they were liked by their classmates, on average. The effect size ($d = 0.27$) was relatively small (a *p*-value is not reported due to complex non-independency in the data), suggesting that the target sample in Study 1 was not very different from any other target sample that might have been construed from the pool of participants. In any case, the effects sizes obtained in all studies so far were highly similar, regardless of how the informants were recruited. Future work might thus explore the possible *consequences* of blind spots.

Notably, the effect size of the distinctive blind spot varied considerably between targets. Individuals with "larger" blind spots are arguably more "out of touch" with the perceptions that others actually have of them. We did not test social consequences of these blinds spots, but future work might explore if being out of touch with social reality has positive or negative consequences for a person. Arguably, individuals who are unaware of how people in their lives consensually perceive their undesirable characteristic (e.g., "bossy") are treated differently and likely experience negative interpersonal outcomes such as social isolation. However, the fact that distinctive blind spot profiles were evaluatively neutral, on average, implies that these profiles might be comprises of a balance of hidden weaknesses *and* hidden strengths. This latter possibility has received very little attention in research so far and clearly deserves more in the future. Indeed, future work might explore whether informing people about the positive characteristics that others consensually attribute to them (without their awareness) systematically increases well-being.

We did not identify the source of blind spots, but a reasonable explanation for the variability in social reality blind spots is the amount and quality of interpersonal feedback that people receive (e.g., Bollich, Johannet, & Vazire, 2011; Luft & Ingham, 1955; Srivastava, 2012). Unfortunately, honest (especially critical) feedback seems hard to get (DePaulo & Bell, 1996; Fay, Jordan, & Ehrlinger, 2012; Larson, 1986) and some blind spots may persist because people are simply lacking honest feedback and see no reason to change (Leising & Müller-Plath, 2009). Therefore, the potential of interpersonal feedback to reduce distinctive blind spots and the related consequences should be further investigated.

While we did find evidence for blind spots in self-knowledge, it is important to note that our participants also showed significant self-other agreement, general meta-accuracy and meta-insight. That is, people agreed considerably with others about their personality and reputation. This provides considerable support for Luft and Ingham's idea (1955) that blind spots (i.e., aspects of a person's personality that only others are aware of) and open areas (i.e., characteristics that are consensually attributed to a target by the target and by others) exist simultaneously. That is, both the extent to which a given characteristic is attributed to a person by perceivers, and the extent to which such attributions are shared across perceivers, are not a matter of "yes or no", but vary continuously. Going further, the current work suggests that a more complete representation of self- and other-knowledge must incorporate meta-perceptions. Indeed, people can and do make valid distinctions between their self-perception and their reputation (Carlson et al., 2011); thus, a true measure of self-knowledge must account for people's insight into the fact that the characteristics they ascribe to themselves may not be shared by others.

References

Asendorpf, J. B., Conner, M., De Fruyt, F., De Houwer, J., Denissen, J. J. A., Fiedler, K., ... Wicherts, J. M. (2013). Recommendations for increasing replicability in psychology. *European Journal of Personality, 27*, 108–119. http://dx.doi.org/10.1002/per.1919.

Bollich, K. L., Johannet, P. M., & Vazire, S. (2011). In search of our true selves: Feedback as a path to self-knowledge. *Frontiers in Psychology, 2*. http://dx.doi.org/10.3389/fpsyg.2011.00312.

Borkenau, P., & Ostendorf, F. (1998). The Big Five as states: How useful is the five-factor model to describe intraindividual variations over time? *Journal of Research in Personality, 32*, 202–221. http://dx.doi.org/10.1006/jrpe.1997.2206.

Borkenau, P., & Zaltauskas, K. (2009). Effects of self-enhancement on agreement on personality profiles. *European Journal of Personality, 23*, 107–123. http://dx.doi.org/10.1002/per.707.

Carlson, E. N., & Kenny, D. A. (2012). Meta-accuracy. Do we know how others see us? In S. Vazire & T. D. Wilson (Eds.), *Handbook of self-knowledge* (pp. 212–257). New York, NY: Guilford Press.

Carlson, E. N., Vazire, S., & Furr, R. M. (2011). Meta-insight: do people really know how others see them? *Journal of Personality and Social Psychology, 101*, 831–846. http://dx.doi.org/10.1037/a0024297.

Connelly, B. S., & Ones, D. S. (2010). An other perspective on personality: Meta-analytic integration of observers' accuracy and predictive validity. *Psychological Bulletin, 136*, 1092–1122. http://dx.doi.org/10.1037/a0021212.

Cronbach, L. (1955). Processes affecting scores on "understanding of others" and "assumed similarity". *Psychological Bulletin, 52*, 177–193. http://dx.doi.org/10.1037/h0044919.

DePaulo, B. M., & Bell, K. L. (1996). Truth and investment: Lies are told to those who care. *Journal of Personality and Social Psychology, 71*, 703–716. http://dx.doi.org/10.1037/0022-3514.71.4.703.

Dunning, D., Heath, C., & Suls, J. M. (2004). Flawed self-assessment implications for health, education, and the workplace. *Psychological Science in the Public Interest, 5*, 69–106. http://dx.doi.org/10.1111/j.1529-1006.2004.00018.x.

Edwards, A. L. (1953). The relationship between the judged desirability of a trait and the probability that the trait will be endorsed. *Journal of Applied Psychology, 37*, 90–93. http://dx.doi.org/10.1037/h0058073.

Fay, A. J., Jordan, A. H., & Ehrlinger, J. (2012). How social norms promote misleading social feedback and inaccurate self-assessment. *Social & Personality Psychology Compass, 6*, 206–216. http://dx.doi.org/10.1111/j.1751-9004.2011.00420.x.

Furr, R. M. (2008). A framework for profile similarity: Integrating similarity, normativeness, and distinctiveness. *Journal of Personality, 76*, 1267–1316. http://dx.doi.org/10.1111/j.1467-6494.2008.00521.x.

Gallrein, A.-M. B., Carlson, E. N., Holstein, M., & Leising, D. (2013). You spy with your little eye: People are "blind" to some of the ways in which they are consensually seen by others. *Journal of Research in Personality, 47*, 464–471. http://dx.doi.org/10.1016/j.jrp.2013.04.001.

Goldberg, L. R. (1993). The structure of phenotypic personality traits. *American Psychologist, 48*, 26–34. http://dx.doi.org/10.1037/0003-066X.48.1.26.

Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*, 504–528. http://dx.doi.org/10.1016/S0092-6566(03)00046-1.

Hofstee, W. K. B. (1994). Who should own the definition of personality? *European Journal of Personality, 8*, 149–162. http://dx.doi.org/10.1002/per.2410080302.

Jacobs, I., & Scholl, W. (2005). Interpersonale Adjektivliste (IAL). *Diagnostica, 51*, 145–155. http://dx.doi.org/10.1026/0012-1924.51.3.145.

John, O. P., & Robins, R. W. (1993). Determinants of interjudge agreement on personality traits: The Big Five domains, observability, evaluativeness, and the unique perspective of the self. *Journal of Personality, 61*, 521–551. http://dx.doi.org/10.1111/j.1467-6494.1993.tb00781.x.

Kenny, D. A. (1994). *Interpersonal perception: A social relations analysis*. New York: Guilford Press.

Kenny, D. A. (2004). PERSON: A general model of interpersonal perception. *Personality and Social Psychology Review, 8*, 265–280. http://dx.doi.org/10.1207/s15327957pspr0803_3.

Kiesler, D. J. (1983). The 1982 interpersonal circle: A taxonomy for complementarity in human transactions. *Psychological Review, 90*, 185–214. http://dx.doi.org/10.1037/0033-295X.90.3.185.

Larson, J. R. (1986). Supervisors' performance feedback to subordinates: The impact of subordinate performance valence and outcome dependence. *Organizational Behavior and Human Decision Processes, 37*, 391–408. http://dx.doi.org/10.1016/0749-5978(86)90037-3.

Leary, T. (1957). *Interpersonal diagnosis of personality*. New York: Ronald Press.

Leising, D., Erbs, J., & Fritz, U. (2010). The letter of recommendation effect in informant ratings of personality. *Journal of Personality and Social Psychology, 98*, 668–682. http://dx.doi.org/10.1037/a0018771.

Leising, D., Gallrein, A.-M. B., & Dufner, M. (2014). Judging the behavior of people we know objective assessment, confirmation of preexisting views, or both? *Personality and Social Psychology Bulletin, 40*, 153–163. http://dx.doi.org/10.1177/0146167213507287.

Leising, D., & Müller-Plath, G. (2009). Person–situation integration in research on personality problems. *Journal of Research in Personality, 43*, 218–227. http://dx.doi.org/10.1016/j.jrp.2009.01.017.

Leising, D., Ostrovski, O., & Borkenau, P. (2012). Vocabulary for describing disliked persons is more differentiated than vocabulary for describing liked persons. *Journal of Research in Personality, 46*, 393–396. http://dx.doi.org/10.1016/j.jrp.2012.03.002.

Leising, D., Ostrovski, O., & Zimmermann, J. (2013). "Are we talking about the same person here?" Interrater agreement in judgments of personality varies dramatically with how much the perceivers like the targets. *Social Psychological and Personality Science, 4*, 468–474. http://dx.doi.org/10.1177/1948550612462414.

Luft, J., & Ingham, H. (1955). *The Johari Window a graphic model for interpersonal relations*. Los Angeles: University of California, Los Angeles.

Nosek, B. A., Spies, J. R., & Motyl, M. (2012). Scientific Utopia II. Restructuring incentives and practices to promote truth over publishability. *Perspectives on Psychological Science, 7*, 615–631. http://dx.doi.org/10.1177/1745691612459058.

Oltmanns, T. F., & Turkheimer, E. (2006). Perceptions of self and others regarding pathological personality traits. In R. F. Krueger & J. L. Tackett (Eds.), *Personality and psychopathology* (pp. 71–111). New York: Guilford Press.

Pashler, H., & Wagenmakers, E.-J. (2012). Editors' introduction to the special section on replicability in psychological science a crisis of confidence? *Perspectives on Psychological Science, 7*, 528–530. http://dx.doi.org/10.1177/1745691612465253.

Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*, 203–212. http://dx.doi.org/10.1016/j.jrp.2006.02.001.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.

Srivastava, S. (2012). Other people as a source of self-knowledge. In S. Vazire & T. D. Wilson (Eds.), *Handbook of self-knowledge* (pp. 90–104). New York: Guilford.

Tenney, E. R., Vazire, S., & Mehl, M. R. (2013). This examined life: The upside of self-knowledge for interpersonal relationships. *PLoS ONE, 8*, e69605. http://dx.doi.org/10.1371/journal.pone.0069605.

Vazire, S. (2010). Who knows what about a person? The self-other knowledge asymmetry (SOKA) model. *Journal of Personality and Social Psychology, 98*, 281–300. http://dx.doi.org/10.1037/a0017908.

Vazire, S., & Mehl, M. R. (2008). Knowing me, knowing you: The accuracy and unique predictive validity of self-ratings and other-ratings of daily behavior. *Journal of Personality and Social Psychology, 95*, 1202–1216. http://dx.doi.org/10.1037/a0013314.

von Collani, G., & Herzberg, P. Y. (2003). Eine revidierte Fassung der deutschsprachigen Skala zum Selbstwertgefühl von Rosenberg [A revised German version of Rosenberg's German scale on self-esteem by Rosenberg]. *Zeitschrift Für Differentielle Und Diagnostische Psychologie, 24*, 3–7. http://dx.doi.org/10.1024//0170-1789.24.1.3.

Ward, A., & Brenner, L. (2006). Accentuate the negative the positive effects of negative acknowledgment. *Psychological Science, 17*, 959–962. http://dx.doi.org/10.1111/j.1467-9280.2006.01812.x.

Wiggins, J. S. (1979). A psychological taxonomy of trait-descriptive terms: the interpersonal domain. *Journal of Personality and Social Psychology, 37*, 395–412. http://dx.doi.org/10.1037/0022-3514.37.3.395.

Wood, D., & Furr, R. M. (2015). The correlates of similarity estimates are often misleadingly positive the nature and scope of the problem, and some solutions. *Personality and Social Psychology Review*. http://dx.doi.org/10.1177/1088868315581119.