Who knows what we are good at?

Unique insights of the self, knowledgeable informants, and strangers into a person's abilities

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Highlights

- We found self-other knowledge asymmetries in abilities.
- In most domains, self-estimates of abilities were at least moderately accurate.
- Only knowledgeable informants had insight into people's verbal intelligence.
- Strangers were unexpectedly accurate about people's spatial intelligence.
- Asymmetries were not explained by self-worth relevance or judgment certainty.

Abstract

Who is the best judge of a person's abilities—the person, a knowledgeable informant, or strangers just met in a 3-min speed date? To test this, we collected ability measures as well as self-, informant- and stranger-estimates of verbal, numerical and spatial intelligence, creativity, and intra- and interpersonal emotional competence from 175 young adults. While people themselves were the most accurate about the majority of their abilities, their verbal and spatial intelligence were only estimable by informants or strangers, respectively. These differences in accuracy were not accompanied by differences in the domains' relevance to people's self-worth or strangers' judgment certainty. These results indicate self-other knowledge asymmetries in abilities but raise questions about the reasons behind these asymmetries.

Keywords: Self-Knowledge; Other-Knowledge; Intelligence; Creativity; Social-Emotional Competence; Person Perception; Self-Other Knowledge Asymmetry; Zero-Acquaintance; Speed Dating

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“Nobody knows you better than yourself” is a common piece of folk wisdom that people tend to believe to be true (Vazire & Mehl, 2008), even though it might be a misconception: People sometimes have surprisingly little insight into their personality traits (e.g., Vazire, 2010) but also their abilities (Zell & Krizan, 2014). The latter might be particularly problematic because an accurate¹ sense of one's strengths and weaknesses can be important. Self-views can inform career decisions and a fit between job demands and actual abilities would be beneficial for the employee and the employer (see also Freund & Kasten, 2012). What is more, self-estimates are widely used in career counseling, sometimes even as more economic replacement of psychometric intelligence tests (Holling & Preckel, 2005). There is also some support that accurate self-views are associated with higher well-being (Kim et al., 2010; Kim & Chiu, 2011). Other work found positive (Humberg et al., 2019) or even overly positive self-views (i.e., self-enhancement; Dufner et al., 2018; He & Côté, 2019) to be more beneficial. Despite the mixed evidence for the relative merits of accurate, positive, or inflated self-views, in many areas, the advantages of self-knowledge are likely greater than the costs (see also Bollich et al., 2011). This raises the following question: How can we improve our limited knowledge about our abilities?

According to Bollich and colleagues (2011, p. 1), “the road to self-knowledge is likely interpersonal”, suggesting feedback from others to be the most promising avenue towards improving self-knowledge. Accurate ability judgments by others can also be relevant in situations like job interviews or even at first dates: Intelligence has been proposed as a fitness indicator that showcases good genes, good health, and good psychological functioning (G. F. Miller, 2000; Prokosch et al., 2009). It should, therefore, be both desirable and detectable in potential mates. Similar arguments have been made for creativity (G. F. Miller, 2000; Prokosch et al., 2009) and emotional competence (Gignac & Callis, 2020; G. F. Miller, 2007). The high relevance of interpersonal perception for a species as social as humans likely led us to be good judges of others (Vazire & Carlson, 2011). And indeed, ability estimates by others can be similarly or sometimes even slightly more accurate than self-estimates (e.g., Borkenau & Liebler, 1993; Denissen et al., 2011) and show relevant predictive validity over and above self-estimates (Denissen et al., 2011; Elfenbein et al., 2015).

Past research indicated that there are personality traits that others can judge accurately but people themselves cannot, just as there are traits for which the opposite holds true (Beer & Vazire,

¹ Here, accuracy refers to the correlation between judgments and the person's performance on an objective performance measure in the domain in question (see also Freund & Kasten, 2012; for a discussion on accuracy criteria see Funder, 1995), if not noted otherwise.

2017; Vazire, 2010; Vazire & Mehl, 2008). The same was observed for ability estimates by adolescents and their schoolmates (Neubauer et al., 2018): While for some abilities, only self-estimates were reasonably accurate, for other domains only peers provided accurate judgments. Thus, requesting feedback from others might be particularly helpful for some abilities but even detrimental for others. It is yet unknown whether these findings generalize beyond the school context. Moreover, the level of acquaintance plays an important role in the accuracy of other-estimates of personality traits (Paunonen, 1989; Vazire, 2010; Wessels et al., 2018). Whether this holds true for abilities is still open. The present investigation aimed to bridge these gaps in the literature. To this end, we compared the accuracy of perceptions of six different abilities provided by people themselves, knowledgeable informants, and a set of strangers just met at a speed-dating event.

1.1. What factors are relevant for accurate interpersonal perception?

Many models of interpersonal perception suggest that both informational and motivational factors affect accuracy (Vazire, 2010). According to Funder's (1995) realistic accuracy model, for accurate judgments, relevant cues of the trait must not only exist and be available to the perceiver but also need to be detected and used correctly by them. While perceivers might be motivated to make accurate judgments, there are also other motivational forces, like the motivation to think one is right (Funder, 1995). Correspondingly, many theoretical models (e.g., Anusic et al., 2009; Leising et al., 2015; West & Kenny, 2011) consider that a perceiver's judgments of a person's trait are not only driven by the person's trait level—the "truth"—but also by biases (i.e., factors besides the truth that affect the judgment; West & Kenny, 2011). Funder (1995) also proposed that accuracy depends on different types of moderators pertaining to the trait, the perceiver and the information available to them, and the target. On the part of the trait, observability (i.e., how visible the trait is) and evaluativeness (i.e., how socially desirable or undesirable the trait is) are relevant for accuracy (Funder, 1995; John & Robins, 1993). More observable traits can be judged more accurately than less observable ones (John & Robins, 1993), especially if there is a low level of acquaintance (Paunonen, 1989) or intimacy (Connelly & Ones, 2010) between the perceiver and the target. Judgments of more evaluative traits are less accurate, particularly if the perceiver likes the target (Leising et al., 2015) or if the judgment is a self-rating (John & Robins, 1993). Highly evaluative traits are thought to be relevant to people's self-esteem, making ego-protective mechanisms stand in the way of accurate self-estimates (see also John & Robins, 1993). The relationship between perceiver and target can also be a relevant moderator, as it determines the quality and quantity of information the perceiver can access (Funder, 1995; see also Wessels et al., 2018).

Vazire's (2010) self-other knowledge asymmetry (SOKA) model is a framework for explaining differences in self- and other-knowledge about people's traits. The SOKA model extended the so-

called Johari window (Luft & Ingham, 1955), according to which traits can be assigned to one of four quadrants based on self- and other-knowledge: The *open area* contains traits both targets themselves and others can judge accurately; the *hidden area* encompasses traits that only targets can judge; the *blind spot* comprises traits that only others can judge; and the *unknown area* holds traits that neither targets nor others can judge accurately. According to Vazire, the location of a trait within the Johari window is determined by two of the aforementioned moderators: observability and evaluativeness. For other-estimates to be accurate (open area and blind spot), the trait must be observable, particularly at low levels of acquaintance; for self-estimates to be accurate (open and hidden areas), the trait must be low in evaluativeness. Results from Vazire's (2010) study confirmed her predictions: Extraversion (high observability, low evaluativeness) was in the open area, neuroticism (low observability, low evaluativeness) in the hidden area, and intellect (low observability, high evaluativeness) mostly in the blind spot. Crucially, the level of acquaintance was also relevant: Only friends—but not strangers—outperformed targets in judging their intellect. So far, the SOKA model has been studied for a variety of characteristics, such as personality traits (e.g., Beer & Vazire, 2017), personality disorders (Carlson et al., 2013), and moral behavior (Thielmann et al., 2017).

Neubauer and colleagues (2018) conducted the first study on the location of a diverse set of abilities—verbal, numerical, and spatial intelligence, creativity, and intra- and interpersonal emotional management abilities—in the SOKA model/Johari window in 14- and 18-year-olds. Accuracy was operationalized as the correlation between the adolescents' performance in relevant ability tests and ability estimates provided by themselves and by randomly assigned classmates. Based on the SOKA model, one might expect that most of these abilities—perhaps apart from the two in the emotional domain—should be located in the blind spot, as they correspond closely to what Vazire (2010) subsumed under intellect and are likely highly evaluative. This was not the case: Creativity and numerical intelligence were in the open area, intra- and interpersonal emotional management abilities were in the hidden area, verbal intelligence was in the blind spot, and spatial intelligence was unknown in 14-year-olds and hidden in 18-year-olds. Moreover, Neubauer and colleagues (2018) found no support that the classmates' reported closeness to the targets moderated accuracy, a finding that could be attributable to the random assignment of peer-raters. It is still unclear to what extent acquaintance is relevant for an ability's location in the model. Equally little is known about the evaluativeness and observability of abilities and whether they are related to accuracy.

Self- and other-knowledge about abilities might not only be relevant during adolescence, when important educational and vocational decisions are made (Neubauer et al., 2018), but also later in life. Adults usually receive less regular feedback on their abilities than pupils, which might make the

maintenance of self-knowledge increasingly difficult. Thus, it is essential to investigate whether the findings of Neubauer and colleagues replicate in an adult sample. In the present study, we assessed self- and other-knowledge in the same six domains that Neubauer and colleagues included since these abilities are related to essential life outcomes such as professional success or academic achievement (e.g., intelligence: Hülshager et al., 2007; Schmidt & Hunter, 1998, 2004; Strenze, 2007; creativity: Hennessey & Amabile, 2010; Plucker et al., 2004; Gajda et al., 2017; emotional competence: Freudenthaler et al., 2008; Joseph et al., 2015; van der Zee et al., 2002). To test the impact of acquaintance on accuracy, we compared estimates by well-acquainted informants to estimates by strangers. Given the lack of literature on evaluativeness and observability of different types of abilities, we built our hypotheses on past findings regarding accuracy (to the extent that they were available).

1.2. Empirical findings on self-and other-knowledge of abilities

1.2.1. Self-knowledge of abilities

A large body of research reported rather low accuracy of self-estimates of abilities (for an overview see Neubauer & Hofer, 2020). Some studies even showed that self-estimates of abilities share more variance with personality traits than with the respective measured ability (Herreen & Zajac, 2018; Neubauer & Hofer, 2021a). There appears to be a pervasive tendency towards overestimation (e.g., Alicke & Govorun, 2005; Gignac & Zajenkowski, 2019). But some people also underestimate themselves and still others have a rather accurate self-view (e.g., John & Robins, 1994). This can be particularly detrimental to overall accuracy since it disrupts rank-order correlations (Beer & Vazire, 2017). Accordingly, several meta-analyses (e.g., Freund & Kasten, 2012; Mabe & West, 1982), which were ultimately aggregated into a metasynthesis (Zell & Krizan, 2014), showed a mean correlation of self-estimates with respective performance measures of only around .3. But accuracy also varies considerably between different domains (Zell & Krizan, 2014).

Verbal, numerical, and spatial intelligence are included in most theories of intelligence by both experts and laypeople (Freund & Kasten, 2012). Out of these three factors, people seem to be best at judging their numerical intelligence (see also Freund & Kasten, 2012): Here, correlations between self-estimates and performance were consistently moderate to high² (Furnham, 2001; Neubauer et al., 2018; Neubauer & Hofer, 2021a; Proyer & Ruch, 2009; Rammstedt & Rammsayer, 2002; Visser et al., 2008). More heterogeneous findings but mostly low correlations were reported for verbal intelligence (Furnham, 2001; Neubauer et al., 2018; Neubauer & Hofer, 2021a; Proyer & Ruch, 2009; Steinmayr & Spinath, 2009; but cf. Rammstedt & Rammsayer, 2002; Visser et al., 2008) and spatial

² Here, we follow common effect size guidelines (Cohen, 1992) for quantifying correlations as small ($r \geq .1$), medium ($r \geq .3$), and large ($r \geq .5$).

intelligence (Furnham, 2001; Neubauer & Hofer, 2021a; Proyer & Ruch, 2009; Visser et al., 2008; Rammstedt & Rammsayer, 2002; but cf. Neubauer et al., 2018; Steinmayr & Spinath, 2009). Many studies have found medium to high associations between self-estimates and variety of creativity criteria (Ceh et al., 2021; Furnham et al., 2005; Neubauer et al., 2018; Pretz & McCollum, 2014; but cf. Neubauer & Hofer, 2021a; Vazire, 2010). Less research related self-estimated emotional management abilities to respective performance measures. In two studies, Elfenbein and colleagues (2015) found low to moderate accuracy correlations for emotional management abilities containing both intra- and interpersonal aspects. Other studies that distinguished between intra- and interpersonal emotional management abilities found moderate to high correlations for both domains (Freudenthaler & Neubauer, 2005; Neubauer et al., 2018; Neubauer & Hofer, 2021a). Taken together, there is considerable evidence that people's estimates of their numerical intelligence, creativity, and intra- as well as interpersonal emotional management abilities correlate at least moderately with performance in respective ability tests. Comparatively lower accuracy was often achieved for verbal and spatial intelligence.

1.2.2. Other-knowledge of abilities

Compared to the large body of literature on self-estimates, studies on the accuracy of other-estimates of abilities are rather sparse (Neubauer & Hofer, 2020). According to Vazire's (2010) findings, knowledgeable informants—in that case friends—can provide moderately accurate judgments of a person's creativity and intelligence and, in that, outperform both strangers and targets themselves. But informants are also subject to biases: Relationship partners overestimate their significant others' intelligence to a similar degree as they themselves (Gignac & Zajenkowski, 2019). Of the few studies that looked at informant-estimates of different types of abilities, many focused on pupils. Parents are moderately accurate about their children's intelligence on different facets (verbal, numerical, spatial, and reasoning; Steinmayr & Spinath, 2009). Both parents and teachers are also reasonably accurate about children's intelligence and creativity but less accurate about their social competence (Sommer et al., 2008). In Neubauer and colleagues (2018), classmates provided moderately accurate estimates of verbal and numerical intelligence as well as creativity but were less accurate about spatial intelligence and intra- as well as interpersonal emotional management abilities. This relative lack of insight of informants into our emotional abilities also appears to persist in adulthood: Elfenbein and colleagues (2015) reported similarly low accuracy for ratings on different aspects of emotional competence by young adults' work colleagues and fellow students.

There are also reports of valid intelligence ratings by unknown others. Strangers can be capable judges of a person's intelligence after observing them in a short video, with correlations ranging from about .2 to up to .5 (Borkenau et al., 2004; Borkenau & Liebler, 1993; Carney et al.,

2007; Reynolds & Gifford, 2001). In Borkenau and Liebler (1993), strangers' intelligence estimates were even slightly more accurate than those by targets themselves or their romantic partners. Ratings of strangers who have interacted with targets appear to be somewhat less accurate: Denissen and colleagues (2011) investigated the validity of intelligence estimates in student groups who were just getting to know each other. After being acquainted for two weeks, peer-estimates within these groups correlated at around .2 with measured intelligence. Vazire (2010) reported low accuracy for intelligence and creativity ratings by strangers who just had a short conversation with the targets. We know of no video- or interaction-based zero- or low-acquaintance studies that investigated accuracy for different intelligence facets or emotional competence.

On the whole, existing studies on other-estimates indicate that it is worthwhile to distinguish between acquainted and unacquainted others and between different ability domains when investigating accuracy. While informants might know a lot about our cognitive abilities, strangers—particularly those that have just met us—might struggle to see us accurately. However, based on past research, it is still unclear for which abilities informants might be more accurate judges than strangers and for which—if any—the reverse is true.

1.3. The present study

The present study aimed to extend research on self-other knowledge asymmetries in abilities (Neubauer et al., 2018) to young adults. We put the potential role of acquaintance to a direct test by including ratings by knowledgeable informants and strangers. As stranger-estimates, we collected ratings by people who had just met the targets in speed dates. The speed-dating design enables naturalistic interactions between perceivers and targets (Finkel et al., 2007) and has mostly been used to study interpersonal attraction (e.g., Asendorpf et al., 2011; Jauk et al., 2016; Wu et al., 2019) but also to investigate the accuracy of first impressions (e.g., Kerr et al., 2020). Intelligence, creativity, and social-emotional competence are among the highest-ranked attributes in prospective mates (Buss et al., 1990; Gignac et al., 2018). Thus, speed dating might be a context, in which accurate perceptions of an interaction partner's abilities are especially relevant.

In our first research question, we wanted to know how accurate the self, an informant, and strangers are about a person's abilities. We based our expectations, which are visualized in Figure 1, on past findings regarding accuracy and theoretical considerations. Specifically, we expected self-estimates to be accurate for numerical intelligence, creativity, and intra- as well as interpersonal emotional abilities but not for verbal and spatial intelligence (see section 1.2.1). We predicted that informant-estimates would be accurate for verbal and numerical intelligence (Neubauer et al., 2018; Steinmayr & Spinath, 2009) and creativity (Neubauer et al., 2018; Sommer et al., 2008; but cf. Vazire, 2010) but not spatial intelligence (Neubauer et al., 2018). Contrary to past work reporting that schoolmates, fellow students, or work colleagues had little insight into people's social-emotional

abilities (Elfenbein et al., 2015; Neubauer et al., 2018; Sommer et al., 2008), we expected our study's well-acquainted informants to be accurate judges of the targets' intra- and interpersonal emotional abilities. Close others are likely often on the receiving end of a person's interpersonal emotional management efforts. Moreover, intrapersonal emotional management abilities correlate highly with neuroticism (Freudenthaler & Neubauer, 2005), which friends judged accurately in Vazire (2010). Data on stranger-estimates were only available for one of our six abilities: In line with Vazire (2010), we expected low accuracy for stranger-estimates of creativity. Denissen and colleagues (2011) reported similar accuracy of intelligence estimates shortly after meeting new classmates and during a year of getting to know them. Therefore, we mostly based our expectations regarding estimates for intelligence facets on past findings for peers (Neubauer et al., 2018), predicting valid stranger-estimates for verbal but not spatial intelligence. As it seems unlikely that numerical intelligence is similarly observable in first dates as it is in school contexts, we expected low accuracy in this domain. Based on the low accuracy of stranger-estimates of neuroticism reported by Vazire (2010), we also expected low accuracy for the related intrapersonal emotional abilities. Finally, we expected accurate stranger-estimates of interpersonal emotional abilities, since speed dating might be a scenario where these skills are particularly relevant and practical relevance is positively associated with accuracy (Gill & Swann, 2004).

Figure 1

Predictions on positions of abilities within the Johari window (Luft & Ingham, 1955)/SOKA model (Vazire, 2010)

Note. Other-knowledge by knowledgeable informants (left) and strangers after 3-min speed dating interactions (right).

Our second research question referred to potential differences in accuracy between perspectives. We expected similar accuracy for all three perspectives for interpersonal emotional abilities (moderate accuracy) and spatial abilities (low to no accuracy). For verbal abilities, we expected estimates by informants and strangers to be more accurate than those by targets themselves. For creativity, numerical and intrapersonal abilities, we expected self- and informant-ratings to be similarly accurate but stranger-ratings to be less accurate than both other perspectives. In our third research question, we investigated the unique predictive validity of each perspective and the amount of variance in measured respective abilities all perspectives could explain conjointly (see also Vazire, 2010). Here, we had no specific expectations.

We also had two exploratory research questions: First, some studies suggest that gender might be related to the accuracy of ability estimates (e.g., Herreen & Zajac, 2018; Steinmayr & Spinath, 2009; but cf. Freund & Kasten, 2012). In the speed-dating design of our study, stranger-estimates for female targets also only stemmed from men and vice versa. Therefore, we explored gender as potential moderator of accuracy with no specific prior expectations. Second, we wanted to collect preliminary data related to the evaluativeness and observability of our domains of interest. Researchers typically obtain assessments of a trait's evaluativeness and observability by asking external raters (experts or laypeople) how socially desirable and easily observable the trait is (e.g., John & Robins, 1993). These trait-level assessments leave little room to investigate individual differences. It is reasonable to speculate that most of the abilities we study are rather desirable and, in that, evaluative (see also Zell & Krizan, 2014), meaning that their self-worth relevance might hamper the accuracy of self-estimates (Vazire, 2010). However, as William James (1890/1950) already suggested, people might differ in what is important to their self-esteem (see also Zell & Krizan, 2014)—a notion that is in line with the concept of contingencies of self-worth (Crocker & Wolfe, 2001). To account for these potential interindividual differences, we let targets directly rate the relevance of each domain to their self-esteem (i.e., in the form of ability-related self-worth contingencies) instead of assessing evaluativeness as trait-level social (un-)desirability. Observability should be particularly relevant in low-acquaintance perception (e.g., Paunonen, 1989; Vazire, 2010), which is why we were particularly interested in its relationship to stranger-estimates. A trait's observability reflects the availability of valid behavioral cues indicative of the trait (Funder, 1995; Thielmann et al., 2017) and this availability can depend on the context (Wall et al., 2013). For this reason, we found it worthwhile to directly assess observability within this study's low-acquaintance context (speed dates). At the speed-dating events, we aimed to collect data with short, intuitive measures to preserve the validity of this naturalistic setting. When we conceptualized our measures and discussed them with laypeople, it became apparent that some struggled to understand the concept of observability. We, therefore, asked raters instead how certain they were of each of their

judgments. As people tend to report higher judgment certainty if more cues are available to them (Tsai et al., 2008) and the availability of cues is at the core of the concept of observability (e.g., Funder, 1995), we considered this to be a valid proxy. There is some evidence that raters' judgment certainty differs across targets (Praetorius et al., 2013). We, thus, assessed judgment certainty for each individual target.

2. Methods

Data for the present study were collected within a larger research project on abilities, interpersonal perception, and romantic attraction. Results on another research question focusing on the relationship between romantic attraction and intelligence, creativity, and emotional management abilities are reported elsewhere (Hofer et al., 2021). In line with community standards (Simmons et al., 2012), we report how we determined our sample size, all data exclusions, and all measures in the study. This study was preregistered and our code and materials are openly available to the extent possible³. Data-collection involved multiple steps: First, targets registered via an online form, where they also provided the contact of an informant. They then took part in a pre-testing session and, finally, in a speed-dating event. The study had been approved by the local ethics committee and all parties provided their informed consent.

2.1. Participants and power analysis

We determined our target sample size of 180 based on power-recommendations for our type of social relations model (Kenny et al., 2006) and to achieve at least 80% power to detect positive correlations of $r \geq .2$ ($n_{\min} = 153$ with $\alpha = .05$)—an effect size that appears reasonable given past work in this area (see e.g., Beer & Vazire, 2017; for a more detailed reasoning see section 2.4; Denissen et al., 2011; Zell & Krizan, 2014). To counter potential drop-out, registration was open for 210. In the end, 180 people (targets; 50% women) participated in all parts of the study—including a speed-dating event. In speed dating, people typically meet others of similar age (Back et al., 2011). Thus, to have relatively age-homogeneous groups, our age limits were 18 to 30 years. Each target attended one of seven heterosexual speed-dating sessions, where they met between 11 and 14 people (women interacted with men and vice versa). After each of these 1157 interactions, both speed-dating partners completed ratings about each other (2314 ratings in total). Data from two homosexual participants and one participant with low compliance⁴ were excluded on the dyadic level

³ In our OSF-project (https://osf.io/wd3kh/?view_only=f2d2e34ee7d048d0a860c6b145879d18), we provide our preregistration as well as a list of any deviations. We share our analysis scripts and all study material that we are allowed to share (i.e., everything apart from copyright-protected tests of intelligence and emotional competence). Data for this project are available via <http://dx.doi.org/10.23668/psycharchives.5606>.

⁴ Due to this target's negative comments during the speed-dating event and an informant email address that was conspicuously similar to the target's own one, we have serious doubts about the quality of their data.

(leaving 2240 ratings). Another two were excluded on the individual level (i.e., their ratings were still included in their speed-dating partner's stranger-estimates) because they had not completed all performance measures. The final sample comprised 175 participants (87 women, 88 men; 2188 ratings) between 18 and 30 years ($M = 22.51$, $SD = 2.81$). 89.7% were university students, 49% of them studying psychology. 79.9% reported A-levels as their highest level of education; 21.1% held a university degree. 166 were single; 4 were in an open relationship and 5 in a monogamous relationship⁵. We recruited participants via social media, mailing lists, and advertisements on campus and in a local magazine. Participation at the speed dating event was free—with comparable commercial offers costing between € 15 and € 20—and psychology students additionally received course credit.

2.2. Procedure

2.2.1. Informant-ratings

We instructed targets to name a person they were close to (e.g., a good friend, roommate, or sibling) and had known for at least 6 months as informant. They could also name a second informant to be contacted as stand-in. We collected ratings by one⁶ informant (108 women, 67 men, age: 18-56, $M = 23.35$, $SD = 5.38$) per target via a 15-minute online survey sent to informants per e-mail. After providing informed consent, informants indicated the closeness of their relationship to the target on the one-item Inclusion of Other in the Self Scale (IOS; Aron et al., 1992). Scores can range from 1 to 7 with higher values for higher closeness and, on average, informants reported relatively high relationship closeness ($M = 5.19$, $SD = 1.41$). They then responded to demographic questions. Like targets themselves, informants were highly educated (66.3% had completed their A-levels and 28% held a university degree). 74.3% were university students, 33.1% of them psychology students. Participants tended to nominate informants of the same gender: 86.21% of women's informants were women; 62.50% of men's informants were men. On average, informants had known the targets for 8.44 years ($SD = 7.39$). With 81.1%, most informants were friends. 14.9% were related to the target (e.g., siblings). Three informants were roommates and another three were romantic partners of the targets. The last measure completed by informants was a scale assessing their estimates of the target's abilities (see section 2.3.2).

2.2.2. Pre-testing session

⁵ As the majority of these participants indicated to be interested in second dates or a relationship with some speed-dating partners, we retained them in the sample to preserve power.

⁶ For two participants two informants had completed the survey. In both cases, the rating that had been completed first was retained.

In a 1.5h-long pre-testing session, participants completed psychometric tests in gender-homogenous groups of between 5 and 25. We first collected data on objective performance via a paper-pencil intelligence test battery and computerized measures of creativity and emotional abilities (see section 2.3.1). Participants then responded to computerized questionnaires on self-estimates of abilities (see section 2.3.2), ability-related self-worth contingencies (see section 2.3.3), and variables that are not relevant to the present research (for a full list of all measures see OSF).

2.2.3. Speed-dating procedure

Each participant attended one of seven speed-dating events that followed the procedure of past studies (Asendorpf et al., 2011; Jauk et al., 2016). Assignment to speed-dating events was random within participants' availabilities. The events took place on weeknights in a baroque chateau on the university's campus in a relaxed atmosphere—with dimmed lights and smooth jazz playing in the background. To avoid contact before the dates, women and men used separate entrances to get to separate waiting areas. There, we provided them with a code to be worn visibly throughout the evening, photographed them under standardized conditions⁷, and gave them standardized instructions. The dates took place in a hall containing 15 speed-dating booths, which were arranged in a triangular shape and each contained a table and two chairs. Men entered the hall first and waited at another set of tables, with their backs towards the booths. Then, women arrived and sat down in the booths. The speed dates started with the ringing of a bell, signaling that men should turn around and join the woman in the booth facing them for the first date. The speed-dating partners had 3 minutes to chat before another signal indicated for men to return to their tables. Both parties then completed their score cards, which contained two dichotomous items on acquaintanceship ("Have you seen this person before?" and "Do you know her/him personally?")⁸, six items to estimate the other persons' verbal, numerical and spatial intelligence, creativity, intra- and interpersonal abilities (see section 2.3.2), another six to measure judgment certainty for the respective abilities (see section 2.3.3), and other items not relevant to the current study (the full score card is available on the OSF). Participants also indicated whether they wanted to meet this partner again. If both partners responded with a yes, they received each other's contact details in the days following the events (13.71% of all dates). Once everybody had completed their score cards, another signal indicated for men to go to the next booth. This procedure was repeated until all men had met all women (and vice versa).

2.3. Main Measures

⁷ These photos were used for physical attractiveness ratings that are not relevant to the present research questions (for a detailed description see Hofer et al., 2021).

⁸ We removed ratings from 55 dates where at least one of the two partners indicated to know the other.

2.3.1. Objective performance measures

We applied three subtests of the well-established German Intelligenz-Struktur-Test-2000-R (Liepmann et al., 2007)—each comprising 20 items—to measure verbal (*similarities*), numerical (*number series*), and spatial intelligence (*figure selection*). All subtests were presented within the time limits and according to the instructions proposed by the test authors. Internal consistency was good for numerical ($\alpha = .87$) and spatial ($\alpha = .77$) intelligence but quite low for verbal intelligence ($\alpha = .55$).

We measured creativity—operationalized as divergent thinking—with a computerized version (Jud, 2018) of the Alternative Uses Task (Benedek et al., 2013; Guilford, 1967). Here, participants had to “find creative ideas that other people would consider original, clever, unusual, interesting, or humorous” for alternative uses of a *plastic bottle*, an *umbrella*, and a *shoe*, each within 2.5 min. They were also told to emphasize originality over quantity. Six non-expert raters (2 men, 4 women) evaluated the originality of participants’ responses on a scale from 0 (not creative) to 3 (very creative), after completing a short training (see also Benedek et al., 2017). Originality was then averaged across the three highest-rated ideas per object and participant to reduce the confounding influence of ideational fluency (i.e., the number of ideas; Benedek et al., 2016, 2017; Smeekens & Kane, 2016). This resulted in satisfactory inter-rater reliabilities ($\alpha_{\text{bottle}} = .86$, $\alpha_{\text{umbrella}} = .86$, $\alpha_{\text{shoe}} = .88$) and internal consistency across objects ($\alpha = .76$). For exploratory purposes, we also calculated mean ideational fluency across objects as an additional creativity measure ($\alpha = .89$).

Intra- and interpersonal emotional management abilities were measured with the typical-performance emotional management test (TEMT; Freudenthaler & Neubauer, 2005). This situational judgment test contains 42 short descriptions of emotionally laden situations, 18 of them requiring intrapersonal and 24 requiring interpersonal emotional management abilities. Out of four response options, participants are asked to select the alternative that is closest to how they would typically react in the given situation. We recoded responses according to their adequacy (1 = least adequate, 4 = most adequate), based on expert consensus established during test construction. As often the case with situational judgment tests (MacCann & Roberts, 2008; McDaniel et al., 2007; Neubauer & Hofer, 2021a)—which are inherently heterogeneous (Libbrecht & Lievens, 2012; McDaniel et al., 2007)—internal consistency for both subscales was rather low (intra: $\omega_t = .60$; inter $\omega_t = .57$). However, a current study (Neubauer & Hofer, 2021b) has found evidence of good test-retest reliability—which is considered a more suitable reliability indicator for these kinds of tests (e.g., McDaniel et al., 2007)—for both subscales (intra: $r_{tt} = .83$; inter: $r_{tt} = .76$). We used mean response adequacy for all analyses.

2.3.2. Self- and other-estimates of abilities

Self- and informant-estimates of verbal, numerical, and spatial intelligence, creativity, and intra- and interpersonal abilities were measured with a questionnaire that was originally constructed

for adolescents (Neubauer et al., 2018) and adapted to adults (Neubauer & Hofer, 2021a). Each subscale contained nine to ten items, with all but the last of them covering different aspects of the pertinent ability (e.g., “It is easy for me to find a synonym for a word.” for verbal abilities). The final item reflected a more global perspective on the respective ability (e.g., “I am very talented in the verbal domain.” for verbal abilities). For informant-estimates, items included blanks that raters were instructed to mentally fill with the target’s name (e.g., “It is easy for _____ to find a synonym for a word.”). Response alternatives ranged from 1 (strongly disagree) to 5 (strongly agree). Internal consistencies were satisfactory to good for both self-estimates ($\alpha_{\text{verbal}} = .86$, $\alpha_{\text{numerical}} = .94$, $\alpha_{\text{spatial}} = .86$, $\alpha_{\text{creativity}} = .81$, $\alpha_{\text{intrapersonal}} = .71$, $\alpha_{\text{interpersonal}} = .83$) and informant-estimates ($\alpha_{\text{verbal}} = .89$, $\alpha_{\text{numerical}} = .94$, $\alpha_{\text{spatial}} = .88$, $\alpha_{\text{creativity}} = .85$, $\alpha_{\text{intrapersonal}} = .82$, $\alpha_{\text{interpersonal}} = .91$). For stranger-estimates, we only presented the six global items due to time constraints at the speed-dating events (e.g., “I think this person is generally very talented in the verbal domain.”).

2.3.3. Self-worth relevance and judgment certainty

In line with the concept of self-worth contingencies (Crocker & Wolfe, 2001), we conceived a six-item measure to assess how relevant high performance in each of the domains was to the participants’ self-worth (e.g., “For my opinion about myself, it is important to be very talented in the linguistic domain.”) with a Likert-like response scale from 1 (do not agree) to 10 (strongly agree). As an approximation of observability, we assessed speed-dating partners’ judgment certainty by asking them on the score cards how certain they were about each of their ability-estimates. They provided their responses on a 5-point Likert-like scale ranging from “very uncertain” to “very certain”.

2.4. Data analytic strategy

Like past work, we took an effect-size-based approach towards accuracy and differences thereof. We regarded correlations between estimated and measured abilities of at least .2 as relevantly accurate (see also Beer & Vazire, 2017; Neubauer et al., 2018; Vazire & Mehl, 2008). This corresponds to the average effect in individual difference studies (Gignac & Szodorai, 2016) and the mostly small to moderate effects in this line of research (e.g., Denissen et al., 2011; Zell & Krizan, 2014). In line with earlier studies (Neubauer et al., 2018; Vazire, 2010), we considered correlational differences of at least .15 as indicative of a relevant difference. Vazire (2010) suggested this approach since .15 corresponds to roughly one standard deviation in the distribution of typical effects in personality and social psychology (see Richard et al., 2003) and available statistical tests of correlational differences are very power-intensive.

Ratings that are aggregated across raters or items are more reliable (e.g., Epstein, 1983) and—for purely statistical reasons—more accurate than ratings made by single perceivers or on single items (e.g., Nestler et al., 2012). To benefit from maximum reliability, we, therefore, aggregated self-

and informant-estimates across multiple items per domain and stranger-estimates across multiple raters⁹. For stranger-estimates of abilities, we computed target effects within the social relations model (SRM), using the formulae provided by Kenny and colleagues (2006). A person's target effect for a given ability represents the average (group-mean-centered) rating they received for this ability. As an example, Ron's target effect for creativity reflects how creative Ron is viewed across all his speed-dating partners, as compared to the other members of his speed-dating session. To enable a better comparison between sources, we also reported accuracy based on disaggregated data, that is data from single items and perceivers (for the importance of reporting both single and aggregate perceiver accuracies see Back & Nestler, 2016). For self- and informant-estimates, we calculated disaggregated accuracy based on the global item (i.e., the item also included in the score cards), so that estimates by all three sources were based on the same, single item. Correlations between these single-item estimates and the respective scale means were between .74 and .87 for self-estimates and .79 and .85 for informant estimates. For disaggregated stranger-estimates, we followed Vazire's (2010) approach: We drew a single perceiver for each target and domain and computed the correlation between their estimate and the target's performance. We repeated this process 15 times, Fisher-*r*-to-*Z*-transformed the 15 correlations, averaged them, and transformed them back to the *r*-metric.

3. Results

We conducted our main analyses in R (R Core Team, 2021; for a full list of packages see Appendix 1 on the OSF; https://osf.io/3bngs/?view_only=f2d2e34ee7d048d0a860c6b145879d18). Our scripts are also available on the OSF. When possible, we report percentile confidence intervals based on 2000 bootstrapping samples to counter violations of assumptions related to non-normality or heteroscedasticity of some variables.

3.1. Descriptive statistics, intercorrelations, and variance partitioning

Descriptive statistics (Table A1 on page 7 of Appendix 1) and intercorrelations (Appendix 2) of all main variables can be found on the OSF. Within the SRM, variance in ratings can be portioned into different components (Kenny et al., 2006). We followed the guidelines by Ackerman and colleagues (2015) to conduct SRM variance partitioning analyses in IBM SPSS (for full results see Table A3 in Appendix 1). Importantly, between 6.91% and 26.66% of the variance in speed-dating ability estimates could be attributed to characteristics of the target (target variance). This target variance was significant for both genders and all ability domains (all $p \leq .001$), indicating a certain consensus in how perceivers saw the same target. Another 7.20% and 20.02% of variance pertained to

⁹ While recruiting multiple informants per target would have likely also resulted in reliability benefits, this would have further increased participant burden, which was already considerable in this multi-step data collection process.

characteristics of the perceiver (perceiver variance). The remaining 62.58% to 76.18% consisted of dyadic components (relationship variance) and error variance.

3.2. Accuracy of self-, informant-, and stranger-estimates and differences between perspectives

To answer our first research question, we have computed correlations between estimates by the different sources and corresponding ability measures. The left-hand part of Table 1 shows these correlations for aggregated estimates (i.e., estimates that are more reliable but less comparable across sources). In line with our expectations, self-estimates of numerical intelligence, creativity, and the two social-emotional abilities showed relevant accuracy (i.e., $r \geq .2$). We had further predicted that informant-estimates would show relevant accuracy for verbal and numerical intelligence, creativity, and the two emotional abilities. Results confirmed these expectations for all but intrapersonal emotional abilities ($r \approx 0$). Finally, we had expected relevant accuracy for stranger-estimates of verbal intelligence and interpersonal emotional abilities. However, only stranger-estimates of spatial intelligence were accurate, with estimates of numerical intelligence slightly below the accuracy threshold. Note that the accuracy of self-, informant-, and stranger-estimates dropped considerably when we used ideational fluency instead of originality as performance criterion for creativity. The right side of Table 1 shows accuracy correlations based on disaggregated data (single items for self- and informant-estimates and single raters for stranger-estimates). Self-estimates again correlated at or above .2 with performance in four of six domains. Informant- and stranger-estimates based on disaggregated data, by contrast, failed to reach the accuracy threshold in any domain. Accuracy for creativity was again lower when ideational fluency instead of originality was used as criterion.

To answer our second research question, we determined for which domains the correlations in Table 1 showed relevant differences between sources (i.e., $r_{\text{diff}} \geq .15$). For aggregated estimates, the following differences emerged: Contrary to our prediction, others had no accuracy advantage over the self for verbal intelligence. Also unexpectedly, informant-estimates of verbal intelligence were more accurate than those by strangers. We had expected that both the self and informants would outperform strangers in estimating numerical intelligence, creativity, and intrapersonal abilities. However, the relevant comparisons only surpassed our threshold for self- but not informant-estimates. Moreover, self-estimates of numerical intelligence and intrapersonal abilities were also more accurate than corresponding informant-estimates. Contrary to our expectations that all perspectives would provide similarly inaccurate estimates of spatial intelligence, stranger-estimates were more accurate than those by informants. Lastly, we had expected comparably accurate estimates of interpersonal abilities by all three sources. However, self-estimates were more accurate than those by strangers. Findings concerning differences between perspectives differed slightly for

disaggregated data: Here, the self was more accurate than both other sources about numerical intelligence, intrapersonal emotional abilities, and creativity. While informants continued to be more accurate than strangers in judging verbal intelligence, strangers were no longer more accurate than informants in judging spatial intelligence.

Table 1

Accuracy Correlations for Self-, Informant-, and Stranger-Estimates of Abilities Based on Aggregated and Disaggregated Data

Domain	Aggregated			Disaggregated		
	Self	Informant	Stranger	Self	Informant	Stranger
Verbal	.149 [-.018, .324] $p = .084$	.209^a [.064, .363] $p = .011$	.021 ^a [-.145, .192] $p = .796$	.143 [-.002, .294] $p = .054$	.192 ⁱ [.045, .339] $p = .016$	.018 ⁱ [-.131, .166] $p = .816$
Numerical	.530^{b c} [.411, .634] $p < .001$	.280^b [.130, .422] $p = .002$	.199 ^c [.054, .337] $p = .007$	.470^{j k} [.342, .583] $p < .001$	.179 ^j [.028, .323] $p = .018$	.117 ^k [-.032, .261] $p = .123$
Spatial	.179 [.045, .313] $p = .010$	.092 ^d [-.046, .226] $p = .188$	.257^d [.124, .384] $p = .002$	.189 [.037, .336] $p = .013$	.117 [-.013, .243] $p = .080$	.151 [.003, .293] $p = .046$
Creativity	.312^e [.170, .436] $p = .002$	.222 [.083, .359] $p = .002$	.146 ^e [-.004, .286] $p = .059$	.313^{l m} [.178, .441] $p < .001$	.073 ^l [-.063, .206] $p = .289$	.045 ^m [-.104, .192] $p = .551$
Intrapersonal	.307^{f g} [.143, .452] $p < .001$	-.001 ^f [-.155, .150] $p = .970$	-.050 ^g [-.196, .096] $p = .474$	.247^{n o} [.097, .392] $p = .004$	.018 ⁿ [-.142, .171] $p = .837$	-.032 ^o [-.180, .117] $p = .673$
Interpersonal	.302^h [.148, .446] $p = .002$	.223 [.068, .376] $p = .005$	.143 ^h [-.037, .323] $p = .148$	.221 [.079, .355] $p = .004$	.086 [-.075, .242] $p = .307$	.078 [-.071, .224] $p = .303$

Note. Aggregated estimates are means across multiple items (self and informant) or group-centered means across multiple raters ("target effects"; strangers). Disaggregated results are based on single, global items for all three sources and, for strangers, they are the average correlation based on 15 repeated analyses for a single stranger per target (see Vazire, 2010). Results for creativity are based on originality. Correlations for ideational fluency and aggregated data were $r_{Self} = .152$ [.015, .289], $r_{Informant} = -.006$ [-.144, .134], and $r_{Stranger} = .017$ [-.127, .155] and for disaggregated data $r_{Self} = .099$ [-.059, .247], $r_{Informant} = -.065$ [-.212, .074], and $r_{Stranger} = .001$ [-.147, .150]. Values in brackets represent 95% confidence intervals (for all aggregated estimates as well as disaggregated self- and informant-estimates they are based on 2000 bootstrap samples). Correlations in bold surpassed our accuracy criterion ($r \geq .2$). Superscripts with the same letter denote accuracy differences of $r_{diff} \geq .15$ between perspectives.

3.3. Unique validity of each perspective and variance explained by all perspectives combined

To determine the unique and conjoint variance in measured abilities that estimates by the different sources could explain (research question three), we ran six multiple regressions (one per

domain) with performance as outcome and estimates as predictors. We used aggregated data for this purpose since we were interested in the best possible prediction. Table 2 shows that the total amount of variance all perspectives explained conjointly ranged from .05 for verbal intelligence to .29 for numerical intelligence. Moreover, for each domain, the regression coefficient of only one of the three perspectives reached significance. In 4 out of 6 cases (numerical intelligence, creativity, intra- and interpersonal emotional abilities), this was the self, with β s ranging from .24 (interpersonal emotional abilities) to .59 (numerical intelligence). Only informant-estimates were a significant predictor of verbal intelligence ($\beta = .18$) and only stranger-estimates predicted spatial intelligence significantly ($\beta = .22$).

Table 2*Unique Predictive Validities of Self-, Informant-, and Stranger-Estimates of Abilities*

Predictor	Verbal		Numerical		Spatial		Creativity		Intrapersonal		Interpersonal	
	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β	<i>b</i>	β
(Intercept)	7.55**		5.37**		8.87**		1.03**		2.55**		2.63**	
	[4.37, 10.77]		[2.64, 8.33]		[5.33, 12.68]		[0.79, 1.29]		[2.16, 2.93]		[2.30, 2.97]	
Self	0.37	.09	2.90**	.59	0.50	.09	0.11**	.26	0.19**	.31	0.11**	.24
	[-0.44, 1.16]		[2.09, 3.75]		[-0.36, 1.33]		[0.05, 0.17]		[0.10, 0.28]		[0.02, 0.20]	
Informant	0.77*	.18	-0.12	-.02	0.25	.04	0.05	.13	-0.01	-.03	0.04	.12
	[0.06, 1.42]		[-0.97, 0.65]		[-0.57, 1.02]		[-0.01, 0.10]		[-0.08, 0.06]		[-0.02, 0.09]	
Stranger	-0.33	-.05	-0.83	-.10	2.14**	.22	0.01	.02	-0.06	-.07	0.03	.05
	[-1.33, 0.67]		[-1.99, 0.41]		[0.72, 3.55]		[-0.07, 0.09]		[-0.20, 0.07]		[-0.08, 0.13]	
R^2	.050*		.288**		.076**		.115**		.100**		.107**	
	[.01,.17]		[.18,.42]		[.03,.17]		[.05,.23]		[.04,.22]		[.04,.24]	

Note. Ratings are based on aggregates across multiple items (self and informant) or multiple raters (target effects; stranger). Results for creativity are based on originality. With ideational fluency as criterion, self-ratings remain the only significant predictor with $\beta = .18$. Values in brackets represent 95% confidence intervals based on 2000 bootstrap samples. * indicates $p < .05$. ** indicates $p < .01$.

3.4. The role of gender

Next, we explored whether gender moderated accuracy. None of the interaction terms for either target gender (self-estimates: all $p \geq .231$; informant-estimates: all $p \geq .135$; stranger-estimates $p \geq .398$) or informant gender (all $p \geq .094$; for detailed results see Tables B1 to B4 of Appendix 1) reached significance. Looking at the accuracy correlations for male and female targets (Tables B5 and B6 of Appendix 1) or informants (Table B7 in Appendix 1) separately yielded somewhat different patterns. However, given the confounding of target and perceiver gender, the non-significant interactions terms for gender, and the small size of the gender-split subsamples, these correlations and potential differences between them should be considered with caution.

3.5. The role of self-worth relevance and judgment certainty

To investigate whether some domains were generally more relevant to targets' self-esteem than others, we computed a one-way within-subject ANOVA. It yielded a significant (Greenhouse-Geisser corrected) effect of domain on self-worth relevance, $F(3.82, 665.35) = 63.58$, $p < .001$, $\eta_g^2 = .212$, which we followed-up with pairwise comparisons with Holm-corrections (for detailed statistics see Table B8 in Appendix 1). Panel A of Figure 2 shows that interpersonal emotional abilities were rated as more relevant than any other domain (all $p < .001$), followed by intrapersonal emotional abilities, in turn being rated more highly than the other four domains (all $p < .001$). Spatial intelligence was rated as least relevant (all $p < .001$). Creativity and verbal and numerical intelligence fell in between. We analyzed potential differences in judgment certainty analogously and found a significant (Greenhouse-Geisser corrected) effect of domain on certainty, $F(2.6, 451.84) = 100.73$, $p < .001$, $\eta_g^2 = .287$. Panel B of Figure 2 shows that, on average, strangers were most certain about their assessment of the targets' interpersonal emotional abilities (all $p < .001$). Verbal intelligence received higher certainty ratings than any of the remaining four domains (all $p < .001$); spatial intelligence was associated with the lowest judgment certainty (all $p < .001$); and the remaining three domains fell in between (for detailed statistics see Table B9 in Appendix 1).

Figure 2*Self-Worth Relevance (A) and Judgment Certainty (B) per Domain*

Note. Raincloud plots (Allen et al., 2019) showing mean self-worth relevance (self-rating) and judgment certainty (across speed-dating partners) per domain with densities and jittered raw data. Error bars represent 95% within-subject confidence intervals with Cousineau-Morey (Cousineau, 2005; Morey, 2008) correction. Due to a lack of sphericity, confidence intervals should be interpreted with caution (Cousineau et al., 2021)

We next investigated the potential moderating role of self-worth relevance on the accuracy of self-estimates in one moderation analysis per domain. This resulted in a significant interaction for numerical intelligence ($b = -0.29$, 95% CI $[-0.52, -0.09]$, $z = -2.70$, $p = .007$). Simple slope analyses showed a positive slope between self-estimate and performance for all levels of self-worth relevance of this domain (all $p < .001$) but decreasing slope size with increasing relevance ($b_{-1SD} = 3.17$; $b_{average} = 2.52$; $b_{+1SD} = 1.86$): The more important it was for a person to be numerically intelligent, the less accurate their assessment of their numerical intelligence. Similar patterns of lower accuracy for high levels of self-worth relevance arose for verbal intelligence, spatial intelligence, and interpersonal

emotional abilities but did not result in significant interaction terms (all $z \leq -1.71$, all $p \geq .087$). In another six analyses, we probed potential moderation effects of judgment certainty on the accuracy of stranger-estimates. None of the relevant interactions reached statistical significance (all $z \leq \pm 1.33$, all $ps \geq .182$). Detailed results of all moderation analyses are available in Tables B10 to B13, interaction plots in Figures B2 and B3 in Appendix 1.

4. Discussion

Who knows what about a person's abilities? Overall, our results suggest that there might be some truth to the popular belief that people themselves are their own best judges: In the majority of domains, self-estimates were the most accurate. However, some abilities were in people's blind spots: Verbal and spatial intelligence could only be judged accurately by informants and strangers, respectively. Conversely, some abilities—particularly those in the social-emotional domain—remained hidden to others. No domain was open or unknown to all three perspectives. Similar asymmetries in self- and other-knowledge were reported for various traits (Beer & Vazire, 2017; Carlson et al., 2013; B. K. Miller & Gallagher, 2016; Thielmann et al., 2017; Vazire, 2010), including the abilities of adolescents (Neubauer et al., 2018). In line with the assumptions of Vazire's (2010) self-other knowledge asymmetry (SOKA) model, knowledgeable informants and strangers differed in what they knew about a person's abilities. According to Vazire's assumptions, self-other knowledge asymmetries should also be determined by a trait's observability and evaluativeness, with highly evaluative traits presumably being more relevant to people's self-worth. We assessed self-worth relevance of abilities directly and used strangers' judgment certainty as a proxy of observability. Our findings suggest that self-other knowledge asymmetries in abilities might not necessarily be determined by these two factors.

Figure 3

Placement of abilities in the Johari window (Luft & Ingham, 1955)/self-other knowledge asymmetry model (Vazire, 2010) with other-estimates by known others (“informant”; left) and previously unknown others after 3-min speed dating interactions (“strangers”; right).

Note. Intra = intrapersonal abilities. Inter = interpersonal abilities. For self- or other-knowledge of any domain to be classified as ‘high’, the respective estimate*performance correlation must be at least .2. A position farther left on the x-axis indicates more accurate self-estimates; a higher position on the y-axis indicates more accurate other-estimates. All correlations are based on aggregated data for maximum reliability. $N = 175$.

4.1. Accuracy of self-, informant-, and stranger-estimates of abilities

Figure 3 shows each ability domain's location within the Johari window (Luft & Ingham, 1955)/SOKA model (Vazire, 2010) according to our correlational results. Results for self- and informant-estimates were mostly in line with our expectations (visualized in Figure 1): Numerical intelligence, creativity, and interpersonal emotional abilities were open to both, targets and informants; targets were blind to their verbal intelligence but informants were not; spatial intelligence was unknown to both parties. Only the location of intrapersonal emotional abilities in the hidden instead of the open area was unexpected. Results for self- and stranger-estimates were less consistent with our expectations: Creativity and numerical intelligence were in the hidden area, as expected, but the same was also true for interpersonal emotional abilities that we had expected in the open area. Compared to our predictions, spatial and verbal intelligence exchanged places so that spatial intelligence was in the blind spot and verbal intelligence was in the unknown area. Figure 3 also demonstrates that the placement of two abilities within the same quadrant does not necessarily mean that they were judged with the same degree of accuracy: While all informant- or stranger-estimates that surpassed our accuracy criterion were indeed rather similarly—and at most moderately (r s .21–.28)—accurate, self-estimates in the numerical domain were (at least descriptively) considerably more accurate ($r = .53$) than those of creativity and intra- and interpersonal abilities (r s .30–.31).

People's lack of insight into their own verbal and spatial intelligence remains striking, particularly when compared to their knowledge about their numerical intelligence. While recent work reported somewhat higher accuracy (r s around .3) for self-estimates of spatial (Hofer, Mraulak, et al., 2022) or both verbal and spatial intelligence (Hofer, Macher, et al., 2022), the finding that people can judge their own numerical intelligence more accurately than the other two facets conforms with the majority of studies in this area (Furnham, 2001; Hofer, Macher, et al., 2022; Hofer, Mraulak, et al., 2022; Neubauer et al., 2018; Neubauer & Hofer, 2021a; Proyer & Ruch, 2009; Rammstedt & Rammsayer, 2002; Steinmayr & Spinath, 2009; Visser et al., 2008). One potential explanation for these differences between facets could be (lack of) familiarity with the respective tasks (see for example Zell & Krizan, 2014): Most tasks that measure numerical intelligence consist of basic mathematical operations that people encounter in a similar form at school. The same cannot be said for many tests of verbal intelligence (e.g., finding similarities between words) or spatial intelligence (e.g., the mental rotation of objects). However, in the present study, self-estimates were completed after the performance tests. Thus, as targets had just been exposed to the tasks, a lack of familiarity is likely not well-suited to explain our results. Interestingly, high schoolers' self-estimates in the spatial domain have often been more accurate (e.g., Neubauer et al., 2018; Steinmayr & Spinath, 2009) than what we or other studies found for adult populations (e.g., Furnham, 2001;

Visser et al., 2008). Unlike the majority of adults, high school pupils likely receive regular feedback on aspects of their spatial abilities (e.g., in geometry) and feedback is often discussed as essential for accurate self-views (e.g., Bollich et al., 2011). Thus, future work could explore increasing task familiarity and providing feedback as ways to move self-estimates of verbal and spatial intelligence out of the blind spot.

Others could complement the self's blind spots: Informants were the only ones with relevant insights into people's verbal intelligence and strangers were the only ones with relevant insights into people's spatial intelligence. Together with past results on peers (Neubauer et al., 2018), parents (Steinmayr & Spinath, 2009), and recently also romantic partners and close friends (Hofer, Macher, et al., 2022), these findings support that acquainted others can judge a person's verbal intelligence validly. Strangers' insight into the target's spatial intelligence was more surprising. Given the unexpected nature of this result, it will be especially important to replicate it. However, some potential explanations already come to mind: Strangers might have based their judgments on different cues and cues can differ in their validity (e.g., Borkenau & Liebler, 1995). As an example, speed-dating partners likely talked about their jobs or studies. Since people with higher spatial intelligence are more likely to seek education or employment in a STEM-related field (Shea et al., 2001), those cues likely had some validity. It seems plausible that informants and targets, who both arguably have access to a much larger number of cues about the target, have relied on other, potentially less valid cues. Coming back to the argument about task familiarity, it should be considered that all perceivers who provided stranger-estimates also took part as main participants and had, therefore, completed a test of spatial intelligence before providing stranger-estimates. If increased task familiarity indeed helped participants to form more accurate judgments of their speed-dating partners' spatial intelligence, what remains puzzling is that (1) this familiarity was not accompanied by more accurate self-estimates and (2) stranger-estimates were rather inaccurate in all other domains. A comparison of how task familiarity might affect both self- and other-estimates of different abilities could shed more light on this issue.

Others knew less about a person's social-emotional abilities than we had anticipated. While well-acquainted informants were more accurate in the interpersonal domain than classmates in the past (Neubauer et al., 2018), they still lacked accuracy in the intrapersonal domain ($r \approx 0$). In that, well-acquainted others might face similar struggles as peers (Neubauer et al., 2018), work colleagues and supervisors (Elfenbein et al., 2015), and teachers (Sommer et al., 2008). Notably, in a recent study, acquaintances and close friends also had relatively little insight into people's intrapersonal emotional abilities while romantic partners were at least moderately accurate (Hofer, Macher, et al., 2022). Thus, knowing a person's intrapersonal emotional abilities might require high levels of emotional intimacy. Strangers had no relevant insight into either of the two social-emotional

domains. Thus, contrary to our expectations, interpersonal emotional abilities do not appear to be estimable after first, short dates. Interestingly, stranger-estimates of both intra- and interpersonal emotional abilities correlated highly with stranger-estimates of verbal intelligence (r .64-.66; see intercorrelation matrix in Appendix 2). Participants may have relied on invalid speech-related cues (e.g., confident speech; Breil et al., 2021) for judgments in the verbal and/or social-emotional domains. Similarly, social-emotional components or other, more general characteristics of the interaction could have contributed to all these estimates. Indeed, speed-dating ratings of liking, which we reported on elsewhere in more detail (Hofer et al., 2021), correlated at between .5 and .7 with stranger-estimates of verbal, intrapersonal, and interpersonal abilities (and considerably less with estimates of numerical, spatial, and creative abilities). The interconnectedness of strangers' perceptions of a person's verbal and social-emotional abilities and their relation to liking is an interesting topic for future research.

Apart from their surprising insight into people's spatial intelligence, strangers were rather inaccurate. These findings stand in contrast to the accuracy correlations reported for stranger-estimates of intelligence in some video-based studies (e.g. up to $r \approx .5$ in Borkenau et al., 2004; up to $r \approx .4$ in Borkenau & Liebler, 1993; but around $r \approx .2$ in Carney et al., 2007). Notably, stranger-estimates of abilities after short, non-romantic real-life interactions seem to be less accurate (e.g., $r \approx .1$ for intelligence and $r \approx .0$ for creativity in Vazire, 2010). What is more, first impressions on speed dates tend to be less accurate than those in more platonic contexts (Kerr et al., 2020). In line with this, another speed-dating study reported an accuracy of intelligence estimates of only around .1 (Driebe et al., 2021). This might be unexpected at the first moment, given that person perception tends to be particularly accurate in pragmatically relevant domains (Gill & Swann, 2004) and that evolution-based theories (e.g., G. F. Miller, 2000, 2007) and cross-cultural studies (e.g., Buss et al., 1990; Walter et al., 2020) suggest that intelligence, creativity, and emotional competence are important in mating contexts. However, current findings—based on data reported here (Hofer et al., 2021) and another speed-dating study (Driebe et al., 2021)—suggest that these abilities might play a lesser role for initial attraction. Instead, easily observable characteristics like physical attractiveness might be more important at first interactions, with abilities potentially becoming relevant at a later stage (see also G. F. Miller & Todd, 1998). The centrality of physical attractiveness at first, short dates might have further impeded accuracy: Stranger-estimates in the majority of ability domains showed positive correlations—some of them as high as .6 to .7—with those of physical attractiveness (for detailed results see Hofer et al., 2021). Thus, participants might have equated their interaction partner's attractiveness with their cognitive, creative, and emotional abilities, irrespective of whether they were actually competent in these domains (see also Langlois et al., 2000). Such halo errors (Thorndike, 1920)—i.e., assigning a person various positive characteristics based on a positive

impression—could also be one reason behind the high correlations between stranger-estimates in different domains. Additionally, targets might have also been motivated to convey a specific, likely very positive, image of themselves to their interaction partners, which could have also impeded accuracy.

Accuracy was further reduced when we disaggregated ratings. This was particularly true for stranger-estimates: The mean accuracy of a single stranger's rating of spatial intelligence was only .15 (compared to .26 for the aggregate) and accuracy varied greatly between raters (from -.02 to .29). While aggregation across strangers offers benefits for reliability and, thus, better possible predictions (see also Back & Nestler, 2016; Epstein, 1983), one should keep in mind that it might not always reflect real-life person perception: At first dates or job interviews ability perceptions often stem from a single source. It will, therefore, remain crucial to investigate how accurate single strangers are in their judgments. Vazire (2010) suggested that aggregating across raters might still reflect real-life contexts to a certain degree: While there is only one person you can ask for self-estimates, you could, at least theoretically, address multiple people for other-estimates. Thus, aggregated stranger-estimates could be viewed as a meaningful measure of the general impression that strangers have of a person's abilities. In a similar vein, informant-estimates would have likely also benefitted from aggregation across raters, although it is, again, unclear to what extent this would reflect related real-life scenarios (e.g., how many and what kind of close others would people consult before making important decisions?). Informants' responses to single, global items about the target's abilities were considerably less accurate than aggregates across multiple items. Even though we used virtually the same questionnaire for informant- and self-estimates, self-estimates suffered less from disaggregation. Whether this discrepancy was driven by the self's greater familiarity with the performance measures or whether there were other mechanisms at work remains open. Overall, the attempt of a fair comparison between the perspectives—that is one that is based on single items responded to by single raters—left the self as the only perspective with relevant insight into any of the domains.

4.2. Self-worth relevance and judgment certainty

Based on Vazire's SOKA model (2010), people struggle when judging their own evaluative—i.e., neither desirable nor undesirable—traits, as those are tied to their self-esteem (see also John & Robins, 1993). In accordance, the low accuracy of self-estimates of verbal and spatial intelligence could be due to a high general relevance of these domains to people's self-worth. Our data do not support this reasoning: On average, spatial intelligence was viewed as least relevant. Even though verbal intelligence was rated as more relevant, the two social-emotional domains—receiving moderately accurate self-estimates—were the most relevant for people's self-esteem. Thus, high general self-worth relevance of a domain does not necessarily go hand in hand with inaccurate

ratings. There was also considerable variance in how relevant people rated the different abilities (see Figure 2), suggesting substantial individual differences rather than a general self-worth relevance or desirability of domains. The idea that people differ in what is tied to their self-worth is in line with the concept of self-worth contingencies (Crocker et al., 2003; Crocker & Wolfe, 2001) and ideas already proposed by William James (1890/1950). People, who saw a domain as more relevant also gave higher self-estimates in this domain (see intercorrelations in Appendix 2). However, moderation analyses indicated that higher self-worth relevance could also be related to less accuracy, at least in the numerical domain: The more importance a person placed on their numerical intelligence, the less accurate they were in estimating it. Simple slopes for three other domains—verbal intelligence, spatial intelligence, and interpersonal emotional abilities—showed similar patterns, although the interaction terms did not reach significance.

According to the SOKA model (Vazire, 2010), one would further expect others—particularly strangers—to require high observability of a trait to judge it accurately. Strangers' accurate estimates of the targets' spatial intelligence should, therefore, be accompanied by high observability of this domain. We would have expected this to be reflected in high judgment certainty. However, strangers were actually the least certain about their ratings in the spatial domain. What is more, verbal intelligence was among the domains associated with the highest general judgment certainty—right behind interpersonal abilities—but was only judged with negligible accuracy. Thus, more observable abilities—at least when operationalized as judgment certainty—might not necessarily be accompanied by more accurate judgments. Like with self-worth relevance, it is also possible that observability affects accuracy not on the domain- but the individual-level: Perhaps some people make it easier to observe specific abilities in them, allowing for higher judgment certainty. There were highly positive correlations between how certain strangers were about their rating of a given target's ability and how competent they viewed this target in the respective domain (see intercorrelations in Appendix 2). In another set of moderation analyses, we explored whether this affected accuracy. However, none of these moderation analyses yielded support for effects of judgment certainty on accuracy.

4.3. Implications for theory, research, and practice

When we view our results in the context of the self-other knowledge asymmetry model (Vazire, 2010), the following conclusions can be drawn: Like for many other traits (Beer & Vazire, 2017; Carlson et al., 2013; B. K. Miller & Gallagher, 2016; Thielmann et al., 2017; Vazire, 2010), we found asymmetries in what the self and others know about a person's abilities: The self seems to be a valid source for estimates of numerical intelligence, creativity, and social-emotional abilities. Informants can provide accurate insights into a person's verbal and numerical intelligence, creativity, and interpersonal emotional abilities. The majority of these findings are in line with an earlier study

on pupils and their peers (Neubauer et al., 2018). Our study added to that by showing that others who differ in their level of acquaintance to a person also differ in how well they can judge the person's abilities: While strangers were overall less accurate than informants, they could provide unique insight into the targets' spatial intelligence. In that, our study also complements a recent one that found differences in what romantic partners, close friends, and acquaintances knew about a person's abilities (Hofer, Macher, et al., 2022). Even though a more direct and comprehensive assessment of ability domains' observability and evaluativeness is needed for a more definite conclusion, it is notable that our results were not in line with the SOKA model's predictions about the role of these characteristics for accuracy.

While evaluativeness and observability are included in many models of person perception (e.g., Funder, 1995; John & Robins, 1993; Leising et al., 2015; Paunonen, 1989), their associations to self-other knowledge asymmetries—particularly those in abilities—warrant further investigation. In a recent loss-of-confidence statement, Vazire noted that her original results (2010) were at least partly based on research practices that likely overstated the relevance of observability and evaluativeness for accuracy (for the full statement see Rohrer et al., 2021). Our results suggest that individual differences in a domain's relevance for people's self-worth might show more promise in explaining accuracy than the domain's general desirability. A closer look at perceiver- and/or target-level individual differences in observability and evaluativeness (or other related characteristics) might, therefore, shed more light on accuracy (for such a more comprehensive modeling approach see Leising et al., 2015). This would also be in line with individual differences in accuracy itself: If all people over- or underestimated themselves (or others) to a similar degree, we would see higher accuracy correlations as estimates would keep their rank-order validity (see also Vazire, 2010). Past research on individual differences in the accuracy of self-estimates showed associations with broad personality traits (Jacobs et al., 2012), specific personality traits like honesty-humility (Hilbig et al., 2014), and the underlying ability level (e.g., Kruger & Dunning, 1999; von Stumm, 2014; but cf. Gignac & Zajenkowski, 2020; Hofer, Mraulak, et al., 2022). There is also evidence of individual differences in the accuracy of other-estimates of abilities: Several studies have reported individual differences in how accurately teachers can judge students' abilities (for an overview see Machts et al., 2016). This is also in line with the different accuracy correlations that we have found for different single strangers. Thus, even though it is unclear whether the SOKA model's predictions on evaluativeness and observability are valid for knowledge about abilities, we do consider it worthwhile to continue investigating self-other knowledge asymmetries. Future work on this topic would likely benefit from considering potential individual differences in accuracy and other characteristics that might account for them.

Our findings regarding overall self- and other-knowledge about a person's abilities—or sometimes rather lack thereof—have implications that are relevant in both empirical and practical contexts. Even though the self was the most accurate source in the majority of domains, the underlying accuracy correlations were only moderate in most cases (see also Freund & Kasten, 2012; Zell & Krizan, 2014). Therefore, in situations that require an accurate assessment of a person's abilities—be it before educational or job decisions or in research—the self should not be the (sole) source to rely on. At least in some domains, others could complement what we know about our abilities (see also Hofer, Macher, et al., 2022; Neubauer et al., 2018): In particular, it might make sense to ask someone who knows us relatively well about our verbal intelligence. Moreover, we found first—and yet to be replicated—indication that strangers might have relevant insight into our spatial intelligence after short interactions. Importantly, however, this insight could only be achieved across a group of strangers. Together with the generally rather low accuracy of strangers, this also leads us to warn against using stranger-estimates as a stand-in for the pertinent ability (e.g., like in past studies on mate appeal Fisman et al., 2006; Karbowski et al., 2016). The low accuracy of ability-estimates by supervisors or colleagues (e.g., Elfenbein et al., 2015) shows that it might also not be wise to rely on other-estimates in professional contexts. We conclude that, in any situation where knowledge of a person's abilities is truly required, psychometrically sound performance tests should be conducted (see also Neubauer et al., 2018).

4.4. Limits of generalizability and future directions

Even though the present study could provide relevant insights into self- and other-knowledge about people's abilities, there are limits to how far our findings should be generalized. First, we did not distinguish between different types of informants. As the majority of informants were friends of the targets, it is open whether family members or romantic partners would show similar other-knowledge (for recent findings on partners', friends', and acquaintances' accuracy see Hofer, Macher, et al., 2022). Second, the perception of new acquaintances within the dating context might be characterized by specific motivations and biases, which are not necessarily generalizable to other judgments at first encounters (Kerr et al., 2020). It would be interesting to see how good strangers are at judging a person's abilities in other settings with practical relevance (e.g., job interviews). Third, we found some indication for potential gender differences in accuracy. However, our design does not enable us to clearly disentangle possible effects of the gender of the target (i.e., are women or men rated more accurately?) from those of the gender of the perceiver (e.g., are women or men more accurate raters?). For this, future research including ratings by both female and male perceivers for the same targets is warranted. Fourth, this study only assessed self-worth relevance and judgment certainty as proxies for evaluativeness and observability. It is yet unclear whether our findings are generalizable to other, more direct measures of these characteristics. Additionally, the

potential moderation effects should be revisited in a larger sample as interaction terms are often less powerful than linear terms (Perugini et al., 2018). Fifth, our results are based on a highly educated sample and should not be generalized beyond that. As some have suggested that associations between self-estimated and measured abilities might be lower at the lower end of the ability spectrum (Kruger & Dunning, 1999; but cf. Gignac & Zajenkowski, 2020; Hofer, Mraulak, et al., 2022), the potentially high cognitive abilities of our sample could have increased accuracy. However, our sample's intelligence quotients were neither conspicuously high nor restricted in dispersion (verbal IQ: $M = 97.75$, $SD = 12.46$; numerical IQ: $M = 104.01$, $SD = 14.18$; spatial IQ: $M = 98.83$, $SD = 16.18$). Finally, it has yet to be determined to what extent the findings based on our young sample generalize to other age groups.

In addition to the future directions mentioned throughout the discussion, research on self-other knowledge asymmetries in abilities might particularly benefit from assessing the validity and usage of cues related to abilities, like done in past video-based studies on stranger-estimates (e.g., Borkenau et al., 2004; Borkenau & Liebler, 1995; Carney et al., 2007). Different sources could use different—and differently valid—cues when judging a person's abilities. A cue-based perspective might, therefore, contribute to finding answers to questions like: "Are self-estimates of verbal intelligence less accurate than those of other domains or those by informants because people use invalid cues when judging their own verbal intelligence?". This type of research could also be particularly interesting in speed dating or other real-life zero-acquaintance settings and might shed some light on why strangers appear to be better at judging targets after viewing videos of them than after actually meeting them. Compared to scripted videos, spontaneous real-life interactions involve a plethora of cues, out of which some may be valid indicators of abilities, but others may impede accurate judgments. In a study by Hughes and colleagues (2021), targets expressed somewhat valid cues of intellect-related aspects of openness in dyadic real-life interactions with strangers and strangers' judgments also showed some correspondence to these cues. However, whether this generalizes to measured cognitive abilities is yet unknown. A recent meta-analysis reported that—at least in video-based studies—only few of the cues that strangers use in their intelligence-estimates are also valid (Breil et al., 2021).

4.5. Conclusion

When it comes to judging what we are good at, it appears that for some of our abilities, there truly is nobody who knows us better than ourselves. People are not uniformly blind to their own abilities or even those summarized under intellect (i.e., intelligence and creativity; Vazire, 2010). Instead, it is important to distinguish between different abilities and intelligence facets. Here, verbal and spatial intelligence were indeed in people's blind spot but accessible to well-acquainted or even just-encountered others. Feedback in these areas likely has the most potential of being "the road to

self-knowledge". Bollich and colleagues (2011, p.4) proposed that "the search for self-knowledge likely requires the active involvement of close others to help fill in our blind spots." In the case of abilities, however, the overall rather low accuracy of all perspectives suggests that the involvement of yet another perspective (i.e., objective ability measures) is necessary.

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