Article

Accuracy in Perceptions of Fundamental Social Motives: Comparisons to Perceptions of Big Five Traits and Associations With Friendship Quality

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Chloe O. Huelsnitz[1], Rebecca Neel[2], and Lauren J. Human[3]

Abstract

Accurately perceiving others' personalities helps people to successfully navigate their social relationships. However, it is not yet clear whether people can accurately perceive one aspect of people's personalities that may be especially important to understand: motivations. Using the fundamental social motives framework, we examined the extent to which people accurately perceived a friend's motivations (vs. big five traits) and how this was related to friendship quality. A sample of friend dyads completed both self- and friend-assessments of the big five traits and the fundamental motives, and rated friendship quality. Perceivers accurately detected their friend's unique, self-reported ordering of motives (i.e., distinctive accuracy), though to a lesser extent than traits. However, accuracy for motives and traits was positively associated with greater friendship quality to a similar extent. Importantly, these associations emerged above and beyond tendencies to view others highly normatively, as socially desirable, and as similar to the self.

Keywords

fundamental motives, big five traits, distinctive accuracy, assumed similarity, normativity, social desirability, friendship quality

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Accurately perceiving others' personalities can be highly functional. Knowing how conscientious, introverted, status-driven, or family-oriented someone is, for example, may help another person decide how best to interact with that person (e.g., Bernieri, 2001; Haselton & Funder, 2006; McArthur & Baron, 1983; Schaller, 2008). Accurate perceptions of others' personality traits may thus facilitate better relationships, and indeed, they are associated with greater liking among new acquaintances (Human, Carlson, Geukes, Nestler, & Back, 2018; Human, Sandstrom, Biesanz, & Dunn, 2013) and greater relationship satisfaction and longevity for established romantic couples (Letzring & Noftle, 2010; Luo & Snider, 2009; Neff & Karney, 2005). However, the majority of prior research on accurate personality impressions has focused on traits, paying less attention to other levels of personality—such as motivations—that may be just as useful to accurately perceive (for exceptions, see Bernard, 2009; Dunlop, McCoy, Harake, & Gray, 2017).

The current study examines the extent to which people accurately perceive a friend's fundamental social motives, such as motivations to achieve status, find and retain a romantic partner, and care for one's family. We explore two primary questions: (a) how accurately motives are perceived and (b) whether greater accuracy for motives is associated with greater friendship quality. We take a profile approach to defining accuracy by examining distinctive self-other agreement—the extent to which a person agrees with their friend about their friend's unique profile of motives, such as whether they are more motivated to achieve status than find a romantic partner. This provides a holistic indicator of accuracy on average across a range of characteristics while simultaneously allowing us to control for and examine other potential contributors to self-other agreement, including normativity (viewing a friend as similar to the average person), social desirability (viewing a friend as similar to the socially desirable personality profile), and assumed similarity (viewing a friend as similar to the self) in perceptions of motives. Furthermore, by examining accuracy for numerous characteristics in a single analysis, this approach both enhances statistical power and reduces the number of separate analyses

[1]University of Minnesota, Minneapolis, USA
[2]University of Toronto, Ontario, Canada
[3]McGill University, Montreal, Québec, Canada

Corresponding Author:
Chloe O. Huelsnitz, University of Minnesota, 75 East River Pkwy, Minneapolis, MN 55455, USA.
Email: miro0047@umn.edu

required, making it ideal when motive-specific hypotheses are not present, as in the current study (for further details on profile and other approaches, see Back & Nestler, 2016; Biesanz, 2010; Borkenau & Leising, 2016). Given that perceptions of the big five traits have been relatively well studied, we compare how accurately people perceive a friend's traits versus motives. Finally, we examine the extent to which perceptions of traits versus motives correspond with friendship quality.

Understanding what another person is like can occur at any of three key levels of personality (McAdams, 1996). At the broadest level, others' traits, such as their extraversion and neuroticism, can help the perceiver understand a person's general behavioral tendencies and dispositions. The majority of prior research on accurate personality perception has been at this level, primarily on traits related to the big five (see Funder, 2012, for a brief review; although see Cohen, Panter, Turan, Morse, & Kim, 2013). However, the second level of personality, which includes goals, strivings, and motivations, is also important to understand, as this level of personality involves more contextualized information about a person and how they are likely to behave. For example, knowing that a person is conscientious may lead you to expect that they will make and follow through on plans, but may not fully indicate whether those plans are geared toward achieving higher status at work, finding a romantic partner, caring for family members, or something else entirely. Thus, fully understanding a person and predicting their behavior may involve accurately perceiving not only broader traits but also more specific motives. Although motivations may be defined in multiple ways, we use the fundamental motives framework to operationalize motives, as these may be especially advantageous to accurately perceive.

Fundamental Motives Framework

The Fundamental Motives approach presumes that human motivational systems have been "built" to manage recurrent adaptive problems of the past. For human ancestors, social life provided many benefits that increased the likelihood that their genes would appear in subsequent generations (i.e., their *inclusive fitness*), such as resource sharing and caring for a broad network of kin. However, social living also brought potential costs to inclusive fitness such as disease, loss of status, and interpersonal violence. Those individuals who more successfully detected and managed these recurrent adaptive problems were more likely to pass their genes onto subsequent generations. Thus, human motivational systems are constructed in large part to attune to and navigate these problems (Kenrick, Neuberg, Griskevicius, Becker, & Schaller, 2010; Schaller, Kenrick, Neel, & Neuberg, 2017; see also Aunger & Curtis, 2013; Bernard, Mills, Swenson, & Walsh, 2005; Buss, 1991; Gigerenzer, 2000; Haselton & Nettle, 2006; Hogan, 1996; MacDonald, 1995; McAdams & Pals, 2006; McDougall, 1908; Sheldon, 2004). Building from developments in evolutionary biology, psychology, and anthropology, the Fundamental Motives Framework (Kenrick et al., 2010; Schaller et al., 2017) proposes that there are seven fundamental social motives: self-protection, disease avoidance, affiliation, status, mate seeking, mate retention, and kin care.

These motivations are fundamental in that they are thought to characterize the basic structure of human social motivation, but because of factors such as life stage and circumstance, individuals nonetheless differ in the extent to which they are motivated to find a mate, avoid physical harm, care for family, and so on. Neel, Kenrick, White, and Neuberg (2016) generated a pool of items to measure individual differences in these motives, conducted factor analyses, and identified multiple factors for the mate retention and affiliation motives. Thus, the full set of fundamental social motives includes self-protection, disease avoidance, affiliation (group), affiliation (exclusion concern), affiliation (independence), status, mate seeking, mate retention (general), mate retention (breakup concern), and kin care. Definitions and sample items of the fundamental motives are shown in Table 1. If the fundamental motives guide human social behavior, then accurately detecting others' motives should help a person predict how others will behave, promoting cooperation and preventing exploitation (akin to predictions from social contract theory; Cosmides, 1985, 1989; Cosmides & Tooby, 1989). Thus, people likely possess both the desire and ability to detect the fundamental motives in others.

Defining Accuracy, Normativity, Social Desirability, and Assumed Similarity

In the current study, we took a componential profile approach to examining accuracy for personality traits and motives (Biesanz, 2010; Cronbach, 1955; Furr, 2008). Thus, we examined the extent to which perceivers' impressions of a target across a series of personality items corresponded with target self-reports, our accuracy validation measure. This componential approach allows for the assessment of two aspects of accuracy: distinctive accuracy and normativity (Biesanz, 2010; Furr, 2008), originally termed differential accuracy and stereotype accuracy (Cronbach, 1955). *Distinctive accuracy* refers to understanding a target's unique profile of traits and/or motives, those that make them different from the average person (e.g., whether a target is more motivated by mate seeking than status). By examining agreement at the item level, distinctive accuracy provides a nuanced, holistic indicator of a perceiver's understanding of a target's unique profile of characteristics both across and within different motives and traits. For example, two perceivers may both recognize that their friend is more motivated by mate seeking than status in general, but one perceiver may recognize that their friend is higher on some aspects of status (e.g., desire for respect) than some aspects of mate seeking (e.g., spending a lot of time thinking about

Table 1. Definitions and Sample Items for the Fundamental Social Motives.

Motive	Definition	Sample item
Self-protection	The motivation to protect oneself from physical threats	*I worry about dangerous people.*
Disease avoidance	The motivation to protect oneself from pathogenic threats	*I avoid places and people that might carry disease.*
Affiliation (group)	The motivation to be a part of and invest in groups of people	*I enjoy working with a group to accomplish a goal.*
Affiliation (exclusion concern)	The motivation to detect and avoid social rejection	*I often wonder whether I am being excluded.*
Affiliation (independence)	The motivation to be alone and independent of social groups	*I like to be alone even if I might lose some friends because of it.*
Status	The motivation to attain social dominance and/or prestige	*I want to be in a position of leadership.*
Mate seeking	The motivation to find a romantic partner	*I would like to find a new romantic/sexual partner soon.*
Mate retention (General)	The motivation to maintain and/or enhance a current romantic partner	*It is important to me that my partner is emotionally loyal to me.*
Mate retention (breakup concern)	The motivation to detect and avoid losing a current romantic partner	*I wonder if my partner will leave me for someone else.*
Kin care (family)	The motivation to support and invest in family relationships	*Caring for family members is important to me.*

ways to meet possible dating partners), thereby demonstrating even greater accuracy. Furthermore, this indicator of accuracy also captures whether the perceiver is able to distinguish a target's standing within a motive or trait, such as whether their friend is more concerned with being respected than obtaining a position of leadership. As such, distinctive accuracy allows for a high level of differentiation in the assessment of perceivers' understanding of their friend's uniqueness. We use the terms distinctive accuracy and accuracy interchangeably.

Importantly, distinctive accuracy controls for the extent to which self-other agreement could be driven by how *normative* perceptions are (Biesanz, 2010; Cronbach, 1955; Furr, 2008). That is, if most people are driven more by mate seeking than status, a perceiver's ratings might agree with a target's self-report because of this overlap with the normative profile, rather than because of an understanding of what makes the target unique. Thus, normativity can contribute to self-other agreement on average, because people will by definition report being similar to the normative profile on average, making it a potentially useful and quick route to agreement, especially for difficult-to-judge characteristics. However, the normative profile tends to be strongly associated with viewing others positively, as the normative profile is highly socially desirable in nature (e.g., Borkenau & Zaltauskas, 2009; Wood & Furr, 2016). Of note, recent work has demonstrated that normativity and social desirability can also be disentangled from one another and have independent correlates (Rogers & Biesanz, 2015; Zimmermann, Schindler, Klaus, & Leising, 2018) and are therefore not fully interchangeable. In the current study, we therefore examine both normativity and social desirability by simultaneously examining the extent to which perceiver impressions correspond to the average and socially desirable profiles for both personality traits and motives.

We also examined the role of *assumed similarity* in perceptions of motives and traits, above and beyond self-other agreement, normativity, and social desirability. As such, we examine distinctive assumed similarity—the extent to which a person views another as sharing one's unique profile of traits and motives (Cronbach, 1955; see also Human & Biesanz, 2011b). Of note, by examining assumed similarity, distinctive self-other agreement, and normativity simultaneously, we are controlling for the extent to which actual distinctive or normative similarity may contribute to the appearance of assumed similarity.

Of note, accuracy and bias in interpersonal perceptions can be independent of each other (e.g., Funder & Colvin, 1997; Gagne & Lydon, 2004). Indeed, although intuitively it may seem that accuracy should be negatively linked to normativity and biases such as assumed similarity and social desirability, at times these constructs actually show highly similar patterns of correlates. For example, accuracy, normativity, and assumed similarity are all positively associated with greater liking (Human et al., 2013), and accuracy and social desirability are both negatively associated with dislike (Zimmermann et al., 2018). Thus, although distinctive accuracy requires being viewed as different from the normative and socially desirable personality profiles, it does not appear to imply being viewed more negatively. Furthermore, it does not seem to be the case that it is more difficult to accurately perceive more normative people because, for example, there

is less distinctive information about such people to detect. Instead, people high in well-being tend to have both highly normative personality profiles (Wood, Gosling, & Potter, 2007) and to be seen with high levels of distinctive accuracy (e.g., Human & Biesanz, 2011a). Overall, then, distinctive accuracy refers to understanding what makes a person unique from others, but not necessarily viewing that person more negatively or as highly unusual.

Differences in Personality Impressions for Motives Versus Traits

Accuracy

Given that substantial prior research has investigated the accuracy of personality trait impressions, such as the big five, we draw upon research and theory in this subfield to develop predictions about the accuracy of motive detection. The realistic accuracy model (RAM; Funder, 1995) outlines the four stages that must be met for an accurate personality impression to be formed: first, *relevant* cues must be made *available* to perceivers, who must then *detect* and appropriately *utilize* those cues. Although this model was developed with personality traits in mind, it seems highly likely that, in general, accurate motive perception will follow a similar process. As such, factors that influence accuracy in perceptions of traits may also influence accuracy in perceptions of motives. One key category of factors that is argued to influence accuracy for traits is characteristics of the traits themselves. Indeed, some traits are considered "good traits" (Funder, 1995), in that they have characteristics that make them easier to perceive, such as a greater relevance or availability of cues. These characteristics may not only help explain why some traits may be easier to judge than others but also shed light on whether motives in general might be easier or more difficult to judge than traits in general. Specifically, in the current study, we considered the role of item visibility—the extent to which a characteristic has visible, external cues that are readily available for outside observers to perceive (Funder & Dobroth, 1987). For example, extraversion is a big five trait that is generally high in visibility and which, in turn, tends to be seen more accurately than traits that are generally less visible and instead more internal in nature, such as neuroticism (Funder & Dobroth, 1987; John & Robins, 1993; Watson, Hubbard, & Wiese, 2000).

In general, motives should be perceived accurately because there are likely to be some relevant cues visible to perceivers, especially to close friends. Indeed, Neel and colleagues (2016) found that fundamental motives predict a wide array of specific behavioral outcomes, such as volunteering, going out dancing, breaking a bone, and seeing a relationship counselor (see also Bernard, 2009). These relationships hold when controlling for big five traits. Thus, a target's fundamental motives have behavioral manifestations that could inform accurate perceptions of motives. Furthermore, friends may discuss each other's motives, providing more motive information via verbal disclosure. Indeed, people agree with their friends and relatives about their motives (Bernard, 2009).

Although motives may on average have some visible cues, it is possible that, in general, motives are less visible than traits. Indeed, motives often involve internal information, such as goals, plans, and desires that may not always manifest behaviorally. Thus, although most motives may have some external, behavioral manifestations, we argue that, on average, motives are likely to be less visible than traits, and therefore, accuracy for motives is likely to be lower than accuracy for traits. This is in line with recent work on self-informant agreement regarding motivational themes in a person's freely listed goals, which found low and generally nonsignificant levels of agreement (Dunlop et al., 2017), suggesting that such information may indeed be more difficult to judge than traits.

Normativity and Assumed Similarity

Differences in visibility may not only influence accuracy but also affect other components of personality impressions, including normativity and assumed similarity. Specifically, both normativity and assumed similarity tend to be higher when information is more limited. For example, in line with predictions from Kenny's (1991, 1994) weighted average model (WAM), as acquaintanceship increases, accuracy tends to increase but normativity tends to decrease, presumably because greater access to information reduces reliance on normative information (Biesanz, West, & Millevoi, 2007).

Relatedly, the self-based heuristic—a tendency to fill in the gaps with self-information when other-information is limited (Ready, Clark, Watson, & Westerhouse, 2000)—contributes to assumed similarity. When it is difficult to judge a specific trait because it is lower in visibility, people rely more on self-information and therefore assume more similarity (Beer & Watson, 2008; Watson et al., 2000). Indeed, when asked to list what a close other's goals are, informants tend to project their own goals (Dunlop et al., 2017). For motives, then, assumed similarity is likely to be substantial and may be higher than accuracy.

Social Desirability

It is less clear whether visibility would influence how positively friends view one another. Much like assumed similarity, people may rely on a bias like social desirability when they have limited information, suggesting that if motives are less visible, friends may be more likely to project positive characteristics onto one another. Nevertheless, people view close others with high levels of social desirability even when a person's true characteristics, including flaws, are clearly visible, arguably because of motivational processes to view the other positively (e.g., Murray & Holmes, 1993). Thus, if viewing another person positively is driven more by motivational than

informational processes, this tendency may be independent of how visible the characteristics are. As such, we have no specific expectation about how item visibility corresponds to the social desirability of impressions of motives.

Personality Impressions and Friendship Quality

Relationships may function well when each person accurately perceives the other. Indeed, accurate perceptions of traits are linked to greater liking (Human et al., 2018; Human et al., 2013; Zimmermann et al., 2018) and romantic relationship satisfaction (Luo & Snider, 2009; Neff & Karney, 2005). We examined whether perceptions of friends' motives—whether accuracy, normativity, social desirability, or assumed similarity of motives—may likewise correspond to positive relationship processes among friends.

Accuracy

Friends should be particularly motivated to accurately detect one another's motives, and accuracy, or a lack thereof, could be quite consequential for the friendship, for several reasons. First, accurate motive perceptions could facilitate goal achievement. If a target wants to find a new romantic partner, for example, having a friend who understands and supports that goal could benefit their friendship as well as the target's ability to achieve that goal (i.e., could promote goal interdependence; see Fitzsimons, Finkel, & Vandellen, 2015). Second, in all types of close relationships, people value being understood by their relationship partner. The feeling that one is perceived accurately (or that one is perceived according to one's own beliefs about oneself) is important for promoting intimacy in the relationship (e.g., Swann, De La Ronde, & Hixon, 1994). People also want to feel as though they know their relationship partners (De La Ronde & Swann, 1998). To the extent that a person's motivations are an important part of their identity, accurate motive perceptions may therefore benefit the relationship through processes such as self- and partner-verification (De La Ronde & Swann, 1998; Swann et al., 1994). Overall, then, we expect that greater accuracy for motives will be associated with greater friendship quality, from the perspective of both the perceiver and the target.

Normativity, Social Desirability, and Assumed Similarity

There is also evidence that viewing others normatively, positively, and with assumed similarity is linked to positive relational processes. Specifically, liking an acquaintance is related to viewing that person's personality traits more normatively (Human et al., 2018; Human et al., 2013), more positively (Rogers & Biesanz, 2015; Wessels, Zimmermann, Biesanz, & Leising, 2018; Zimmermann et al., 2018), and with greater assumed similarity (Human & Biesanz, 2011b; Human et al., 2013; Morry, 2007; Selfhout, Denissen, Branje, & Meeus, 2009; Sunnafrank & Ramirez, 2004). Thus, we also examined whether seeing others' motives normatively, positively, and with assumed similarity is similarly linked to friendship quality.

The Current Research

To examine whether friends perceive each other's motives with distinctive accuracy, we recruited friend dyads to complete assessments of the fundamental motives and big five personality traits for themselves and each other. We anticipated that friends would accurately perceive each other's fundamental motives, although to a lesser extent than their personality traits, given their likely lower visibility. We also expected that friends would view each other's motives normatively and with assumed similarity, possibly more so than traits, but we did not have firm predictions about how social desirability in perceptions of motives would differ from traits. Finally, we expected that accuracy, normativity, social desirability, and assumed similarity for both motives and traits would all be related to greater friendship quality, but we did not have predictions regarding whether the links would be stronger for one level of personality than another.

Method

Participants

A total of 264 participants were recruited across two waves of data collection to participate in a fully dyadic study, including one sample of undergraduate students ($N = 130$ people, 65 dyads) and one community sample ($N = 132$ people, 66 dyads),[1] resulting in a final sample of 262 participants (131 dyads; see Table 2 for demographic information). The study took place at a large Midwestern university. Participants were compensated with their choice of either a US$10 gift card or, for the undergraduate students, course credit.

Data from both samples were analyzed together, and there were very few cases where sample significantly moderated the associations reported below. Furthermore, even when significant differences emerged, the pattern of results was highly similar. The results reported below were also highly consistent controlling for participant age and gender, so we did not include these as control variables in the analyses reported below.

Procedure

Friend dyads. Undergraduate students were recruited through mass emails to university undergraduates and via fliers posted around campus. Community participants were recruited using mass emails to university staff, fliers posted locally, and advertisements on Craigslist and local newsletters. For both

Table 2. Descriptive Statistics for Demographic Information, Traits, Motives and Relationship Factors.

	Undergraduate sample (N = 130 people; 65 dyads)	α	Community sample (N = 132 people; 66 dyads)[a]	α	Averaged across samples
Traits					
Openness					
Self	M = 4.55; SD = 1.01	.81	M = 4.57; SD = 0.93	.86	.84
Friend	M = 4.94; SD = 0.93	.83	M = 5.06; SD = 0.88	.83	.83
Conscientiousness					
Self	M = 4.95; SD = 0.51	.80	M = 5.14; SD = 0.75	.76	.78
Friend	M = 5.26; SD = 0.96	.84	M = 5.39; SD = 0.80	.76	.80
Extraversion					
Self	M = 4.55; SD = 0.86	.85	M = 4.62; SD = 1.26	.90	.88
Friend	M = 5.03; SD = 1.05	.86	M = 5.05; SD = 1.18	.87	.87
Agreeableness					
Self	M = 5.33; SD = 0.77	.73	M = 5.32; SD = 0.84	.70	.72
Friend	M = 5.28; SD = 0.90	.81	M = 5.24; SD = 0.93	.81	.81
Neuroticism/Emotional stability					
Self	M = 4.23; SD = 0.82	.84	M = 4.35; SD = 0.50	.79	.82
Friend	M = 3.38; SD = 1.18	.86	M = 3.57; SD = 1.19	.87	.87
Motives					
Self-protection					
Self	M = 4.71; SD = 1.16	.87	M = 4.52; SD = 1.12	.83	.85
Friend	M = 4.60; SD = 1.21	.93	M = 4.68; SD = 1.06	.86	.90
Disease avoidance					
Self	M = 3.50; SD = 1.22	.86	M = 3.53; SD = 1.25	.84	.85
Friend	M = 3.75; SD = 1.26	.90	M = 3.79; SD = 1.34	.90	.90
Affiliation (group)					
Self	M = 5.26; SD = 0.90	.80	M = 5.20; SD = 0.92	.81	.81
Friend	M = 5.05; SD = 1.00	.84	M = 5.07; SD = 0.96	.80	.87
Affiliation (exclusion concern)					
Self	M = 4.67; SD = 1.05	.82	M = 4.33; SD = 1.25	.86	.84
Friend	M = 4.45; SD = 1.07	.84	M = 4.30; SD = 1.30	.89	.87
Affiliation (independence)					
Self	M = 4.37; SD = 1.02	.79	M = 4.39; SD = 1.43	.82	.81
Friend	M = 3.91; SD = 1.29	.88	M = 3.86; SD = 1.25	.86	.87
Status					
Self	M = 4.89; SD = 0.79	.67	M = 4.75; SD = 0.97	.75	.71
Friend	M = 4.76; SD = 0.93	.76	M = 4.85; SD = 0.95	.77	.77
Mate seeking					
Self	M = 3.30; SD = 1.53	.89	M = 3.20; SD = 1.75	.93	.91
Friend	M = 3.09; SD = 1.68	.93	M = 3.19; SD = 1.91	.95	.94
Mate retention (general)					
Self	M = 5.93; SD = 0.85	.72	M = 6.00; SD = 0.77	.63	.68
Friend	M = 5.83; SD = 0.87	.68	M = 5.93; SD = 0.99	.72	.70
Mate retention (breakup concern)					
Self	M = 3.14; SD = 1.29	.88	M = 2.97; SD = 1.55	.93	.91
Friend	M = 3.15; SD = 1.51	.92	M = 3.26; SD = 1.46	.91	.92
Kin care (Family)					
Self	M = 6.17; SD = 1.01	.79	M = 5.97; SD = 1.15	.84	.82
Friend	M = 5.41; SD = 0.77	.73	M = 5.26; SD = 0.92	.77	.75

[a]Although we specifically recruited friends for the undergraduate sample data collection (which took place before the community sample data collection), some participants indicated to researchers that they were in other types of relationships with the friend they brought to the lab (e.g., roommates, co-workers). Thus, when the community sample data collection took place, we assessed the type of relationship. Although most participants indicated their relationship with their counterpart was a friendship (81.3%), other types of relationships were reported as well, such as romantic relationships (23.1%), co-workers/colleagues (11.9%), roommates (3.7%), relatives (3%), and other relationships, such as neighbors (3.7%).

samples, participants were asked to come to the lab with a friend to participate in a study on social motivations and friendship. Friend was defined as

> a person whom you are not related to, but whom you have a relationship with of some form. This can be someone you've known only a short time, or your whole life, and you can feel any level of closeness to that person.

Once the friend dyads arrived at the lab, they sat at computers in separate rooms and completed two self-assessments: a version of the Fundamental Social Motives Inventory (FSMI; Neel et al., 2016) and the Big Five Inventory (BFI; John & Srivastava, 1999). Next, participants completed observer report versions of the scales, referencing their friend. Then, participants completed measures of friendship quality.[2] Finally, each participant provided demographic information.

Measures

See Table 2 for descriptive statistics and internal reliability estimates on the following measures.

Personality. The BFI (John & Srivastava, 1999) was used to assess personality traits. The BFI comprises 44 items assessing five personality dimensions (openness [e.g., "Has an active imagination"], conscientiousness [e.g., "Makes plans and follows through with them"], extraversion [e.g., "Is outgoing, sociable"], agreeableness [e.g., "Likes to cooperate with others"], and neuroticism/emotional stability [e.g., "Worries a lot"]). Participants are asked to indicate their agreement with each statement on a 7-point Likert-type scale (1 = *strongly disagree* to 7 = *strongly agree*). Averaged across samples and subscales, the reliability estimate of the BFI was $\alpha = .80$, which is comparable with past reliability estimates found for the BFI ($\alpha = .76$; Barrick & Mount, 1991).

Social motivations. We used 66 items from an expanded version of the FSMI (Neel et al., 2016) to assess 10 fundamental motives (self-protection, disease avoidance, affiliation [group], affiliation [exclusion concern], affiliation [independence], status, mate seeking, mate retention [general], mate retention [breakup concern], kin care [family]; given the low number of participants in our sample likely to have children, we excluded items measuring the kin care [child] motive). The version we used includes all 60 items from the 2016 FSMI that measure these 10 motives, as well as two additional items for affiliation (exclusion concern), one for affiliation (independence), two for status, and one for kin care (family) that were part of the measure at the time of data collection (2013-2014). See Table 1 for sample items and definitions of each motive. Participants are asked to indicate their agreement with each statement in general currently (1 = *strongly disagree* to 7 = *strongly agree*). For each of the 10 fundamental motives, there were six to eight items reflecting each motive, which were averaged to form composite subscale scores. Averaged across samples and subscales, the reliability estimate of the FSMI ranged from $\alpha = .68$ (mate retention—general) to $\alpha = .91$ (mate retention—breakup concern), which is comparable to past reliability estimates found for the FSMI ($\alpha = .78$ [status and mate retention—general] to $\alpha = .94$ [mate retention—breakup concern; Neel et al., 2016).

Friendship quality. The Friendship Qualities Scale (FQS; Bukowski, Hoza, & Boivin, 1994) comprises five scales with four items each that assess companionship, conflict, help, security, and closeness in friendships. Participants are asked to indicate the extent to which the statement is true or untrue on a 7-point response scale, with responses ranging from 1 = *not true* to 7 = *really true*. These scales were aggregated to form a single composite measure of friendship quality and then the measure was standardized ($\alpha = .85$). Bukowski and colleagues found reliability estimates (Cronbach's α) for the FQS subscales ranging from .71 to .86.[3]

Assessing visibility and social desirability. A separate sample of 123 undergraduates provided ratings of trait and motive visibility and desirability (see Table 2 for demographic information). Undergraduates were recruited through the psychology department subject pool and rated the observability (1 = *not at all observable* to 7 = *extremely observable*) and social desirability (1 = *not at all desirable* to 7 = *extremely desirable*) of all items in the FSMI and BFI (counterbalanced) and provided demographic information.

Analytic Approach

Data were analyzed following the social accuracy model procedures (Biesanz, 2010; see Human & Biesanz, 2011b, for detailed empirical examples) using *R*'s lme4 package (Bates, Machler, Bolker, & Walker, 2015; R Development Core Team, 2006). The raw data files and *R* code for all primary and supplementary analyses can be found on the Open Science Framework (OSF): osf.io/ns4h9/?view_only=0d1ccb89fd40486eb6a8783aa28a7fdd. This modeling approach is ideal for the current study as it allows for the assessment of each personality impression component of interest within the same model, thereby enabling us to examine and control for each in a single analysis. This approach therefore incorporates substantial data within each analysis, making it both high in statistical power and concise, allowing us to simultaneously examine multiple, theoretically meaningful personality impression components, as well as possible correlates of each.

To assess distinctive accuracy, normativity, social desirability, and distinctive assumed similarity with this model, a multilevel regression model was examined with four predictors of perceiver impressions: the distinctive accuracy validation measure (the target's self-report on each item), the normative accuracy validation measure (the mean self-report on each item),

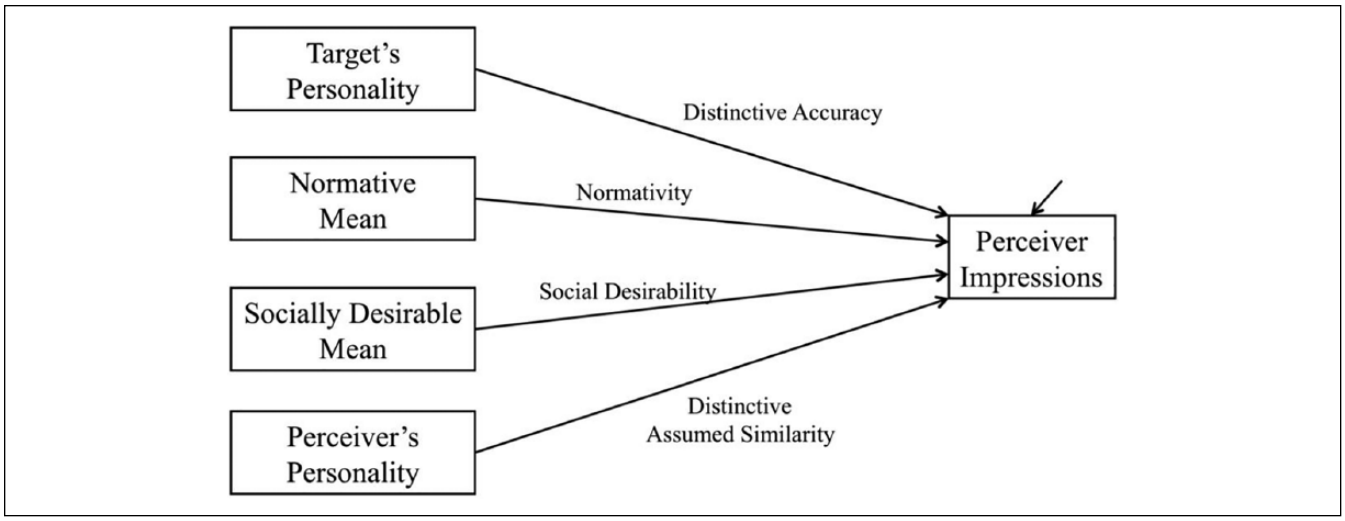

Figure 1. The social accuracy model expanded to include social desirability and distinctive assumed similarity.
Note. Intercorrelations among predictors not depicted for simplicity. The stand-alone arrow leading to perceiver impressions reflects error.

the social desirability validation measure (the mean social desirability rating of each item), and the assumed similarity validation measure (the perceiver's self-report on each item). See Figure 1 for visual depiction of the model. Prior to analyses, we within-item centered the distinctive accuracy and assumed similarity validity profiles by subtracting the mean self-report on each item to ensure orthogonal predictors, and then all profiles were grand-mean centered to assist with model interpretation and convergence (see Biesanz, 2010, for detailed discussion of centering in social accuracy model [SAM] of interpersonal perception). Each perceptual tendency was allowed to vary randomly across perceivers as follows:

$$Y_{ik} = \beta_{0i} + \beta_{1i}\text{TSelf}_{ik} + \beta_{2i}\text{Norm}_k + \beta_{3i}\text{Pos}_k + \beta_{4i}\text{PSelf}_{ik} + \varepsilon_{ik} \quad (1.1)$$

$$\beta_{0i} = \beta_{00} + u_{0i}$$

$$\beta_{1i} = \beta_{10} + u_{1i}$$

$$\beta_{2i} = \beta_{20} + u_{2i} \quad (1.2)$$

$$\beta_{3i} = \beta_{30} + u_{3i}$$

$$\beta_{4i} = \beta_{40} + u_{4i}$$

Here, Y_{ik} is perceiver i's rating of their friend on item k, TSelf_{ik} is perceiver i's friend's self-report on item k after partialling out the normative profile, Norm_k is an estimate of the normative profile based on the mean self-report on item k across all participants (items are not reverse coded), Pos_k is an estimate of the positive personality profile based on the mean social desirability rating on item k across all raters, and the perceiver's own personality PSelf_{ik} is perceiver i's self-report on item k. Thus, β_{1i} reflects distinctive accuracy, the extent to which targets' unique self-reported characteristics (i.e., the characteristics that differentiate the target from the average person) predict perceivers' ratings of that target, on average across all perceivers. β_{2i} reflects the extent to which the mean self-report predicts perceivers' ratings of their friend or the average level of normativity across perceivers. The regression coefficient β_{3i} reflects the average level of social desirability across perceivers, the extent to which the mean social desirability rating predicts perceivers' ratings of their friend. Finally, β_{4i} reflects distinctive assumed similarity, the extent to which perceivers' own unique traits predict perceivers' ratings of their friend, on average across perceivers, controlling for actual similarity (the target in dyad j's self-report on item k), normative similarity (the mean target self-report), and social desirability (the mean social desirability rating).

The coefficients β_{00}, β_{10}, β_{20}, β_{30}, β_{40} in Equation 1.2 represent the fixed effects or the average intercept, distinctive accuracy, normativity, social desirability, and assumed similarity slopes, respectively, across both perceivers and items. The us reflect the perceiver random effects in terms of deviations from the fixed effects. Specifically, u_{1i} is perceiver i's unique distinctive accuracy slope, u_{2i} is perceiver i's unique normativity slope, u_{3i} is perceiver i's unique social desirability slope, and u_{4i} is perceiver i's unique assumed similarity slope. The random effect values for each perceiver are not directly estimated—instead the variance of the us across perceivers is estimated (represented by $\hat{\tau}$ in Table 3), providing an index of how much perceivers varied from one another in their accuracy, normativity, social desirability, and assumed similarity. However, given that perceivers only rated one target (their friend), we could not disentangle the extent to which the random effects variance was due to perceivers or

Table 3. Mean Levels of and Variance in Accuracy, Normativity, Social Desirability, and Assumed Similarity Overall and for Traits and Motives.

Personality impression component	Fixed effects		Random effects
	b	*SE*	$\hat{\tau}$
Overall			
Accuracy	.26***	.011	.16***
Normativity	.75***	.021	.28***
Social desirability	.24***	.026	.37***
Assumed similarity	.20***	.013	.19***
Traits			
Accuracy	.29***	.014	.18***
Normativity	.80***	.034	.41***
Social desirability	.25***	.032	.46***
Assumed similarity	.15***	.017	.24***
Motives			
Accuracy	.23***	.014	.19***
Normativity	.84***	.027	.32***
Social desirability	.07*	.035	.42***
Assumed similarity	.25***	.015	.22***

Note. Intercept random effects were also modeled but are not presented. *b* = unstandardized regression coefficients; $\hat{\tau}$ = estimated random effect standard deviations across perceivers . *$p < .05$. ***$p < .001$.

targets, as these are fully redundant. In other words, because each participant only rated one target and was only rated by one perceiver, we cannot determine whether accuracy levels, for example, were driven by variability in perceiver ability versus target expressivity.

Furthermore, because participants were nested within dyads and the data were fully dyadic (all participants were both a perceiver and a target), it was possible to allow intercepts and slopes to vary randomly by dyad (i.e., allow for the errors variances of the two members of each dyad to be correlated), to account for the dependence that may come from friends rating each other (i.e., friends' rating styles may be more similar to each other than strangers'). However, though generally significant, dyadic random effect variance was very small and their inclusion contributed to model convergence issues. Thus, in line with a recent guide to using SAM with dyadic data (Rogers, Wood, & Furr, 2018), the final models only included perceiver random effects, although the pattern of results was highly similar when dyadic random effects were included.

To examine whether levels of accuracy (and normativity, social desirability, and assumed similarity) differ for perceptions of traits versus motives, we included a dummy variable (Motive_k) indicating whether each item *k* was either a trait (= 0) or a motive (= 1) as a moderator variable predicting each interpersonal perception component, as follows:

$$\beta_{0i} = \beta_{00} + \beta_{01}\text{Motive}_k + u_{0i}$$

$$\beta_{1i} = \beta_{10} + \beta_{11}\text{Motive}_k + u_{1i}$$

$$\beta_{2i} = \beta_{20} + \beta_{21}\text{Motive}_k + u_{2i} \quad (1.3)$$

$$\beta_{3i} = \beta_{30} + \beta_{31}\text{Motive}_k + u_{3i}$$

$$\beta_{4i} = \beta_{40} + \beta_{41}\text{Motive}_k + u_{4i}$$

The unstandardized coefficients β_{11}, β_{21}, β_{31}, and β_{41} represent the interaction between whether the item was a trait or motive and distinctive accuracy, normativity, social desirability, and assumed similarity, respectively. Specifically, positive values for estimates of β_{11}, β_{21}, β_{31}, and β_{41} would indicate that distinctive accuracy, normativity, social desirability, and assumed similarity, respectively, were greater for motives versus traits. In exploratory analyses, we also examined whether there were differences in levels of accuracy for each trait and motive, relative to the average of all of traits and motives, respectively—see supplementary online materials (SOM) and OSF: osf.io/ns4h9/?view_only=0d1ccb89fd40486eb6a8783aa28a7fdd.

A similar approach was taken to examine the role of trait visibility. Specifically, the mean item visibility rating was included as a moderator predicting each component of impressions. This allowed us to examine whether levels of accuracy were greater for items that were rated as more visible. Furthermore, by including both the trait versus motive dummy-coded variable and item visibility as moderators within the same model, we could examine whether item visibility contributed to any differences in impressions for traits versus motives.

To examine how friendship quality was associated with accuracy, normativity, social desirability, and assumed similarity, perceiver- or target-rated quality was again included as a moderator or a predictor of each slope. We also examined whether the links between perceiver and target friendship quality and impressions were moderated by whether perceptions were of traits or motives by including the dummy-coded trait versus motive variable as an additional moderator and examining the three-way interactions between the target's validity measure, friendship quality, and trait versus motive code predicting perceiver impressions. A significant positive three-way interaction would indicate that the association between accuracy, for example, and friendship quality was stronger for motives compared with traits.

We do not report effect size estimates for the overall levels of accuracy, normativity, social desirability, and assumed similarity because there is not an established method for doing so for these Level 1 effects. Instead, in the discussion, we descriptively compare the Level 1 effects with past work examining accuracy, normativity, and assumed similarity for perceptions of traits using similar rating scales and modeling

approaches. Furthermore, we have included standardized effect size estimates (*d*s) for the key Level 2 analyses examining the links between accuracy, normativity, social desirability, and assumed similarity and moderators including traits versus motives, item visibility, and friendship quality. For continuous moderators such as friendship quality, *d*s were calculated as the change in the accuracy slope for a 2-standard deviation (*SD*) change in the moderator, divided by the perceiver random effect estimate *SD* for that slope, to make estimates comparable with Cohen's *d* (see Gelman, 2008). To obtain confidence intervals (CIs), we computed bootstrapped CIs using 500 parametric resamples from the model.

Overall, then, using SAM allows us to (a) simultaneously assess levels of distinctive accuracy, normativity, social desirability, and assumed similarity for traits and motives; (b) examine whether levels differ for traits versus motives and whether differences are driven by item visibility; and (c) whether distinctive accuracy, normativity, social desirability, and assumed similarity are associated with friendship quality and whether the links differ for traits versus motives.

Sensitivity analysis. We used the fabs package for R (github\jbiesanz\fabs) to compute expected power. Given that effect size estimates for the Level 1 effects are not available, we used the association between accuracy for personality traits and liking among new acquaintances in Human and Biesanz (2011b) as an initial effect size estimate for the key Level 2 effect of whether accuracy would be associated with greater friendship quality. This also provides a more conservative power estimate given that it is based on detecting a moderation effect. Human and Biesanz (2011b) found a medium effect ($d = .46$) between accuracy and liking with a sample of 107 participants. According to these calculations, which incorporate the uncertainty associated with this effect size estimate, this study has an expected power of .91 with a sample of 262 (see Biesanz & Schrager, 2017; McShane & Böckenholt, 2016).

Results

Mean levels. We first examined components of personality impressions across both traits and motives (see Table 3, fixed effects). Indeed, participants were able to accurately perceive their friend's unique, self-reported ordering of traits and motives (distinctive accuracy), tended to perceive their friend's traits and motives as similar to the normative personality profile (normativity) and socially desirable personality profile, and tended to assume their friend shared their own unique traits and motives, above and beyond actual similarity (distinctive assumed similarity). Personality impressions were substantially similar to the normative profile—indicated by larger *b* values for normativity—while also demonstrating lower but significant levels of accuracy, social desirability, and assumed similarity.

There were significant and similar levels of variance in accuracy, normativity, social desirability, and assumed similarity (see Table 3, random effects). Thus, there was substantial variation in the extent to which perceivers viewed targets accurately, normatively, positively, and as similar to the self.

Traits versus motives. Did levels of accuracy differ for traits versus motives? As anticipated, motives were less accurately judged than personality traits (see Table 4, separate analyses). Furthermore, motives were seen more normatively and with greater assumed similarity than were traits. Finally, social desirability contributed less to friends' perceptions of motives than of traits.

Role of item visibility. If motives are less visible than traits, this could contribute to the different levels of accuracy, normativity, and assumed similarity for motives versus traits observed above. Indeed, motive items were on average rated as less visible than big five trait items, $b = -.69$, $z = -8.38$, $p < .001$. Furthermore, item visibility was associated with significantly greater accuracy and lower normativity and assumed similarity (see Table 4, separate analyses). In turn, when controlling for item visibility, the effects of motives versus traits on accuracy and assumed similarity remained significant but the magnitude of the effects did reduce quite substantially, by roughly half (see Table 4, combined analyses). Furthermore, the difference between traits and motives on normativity was no longer significant. Meanwhile, the effects of item visibility remained significant and of a similar magnitude. Thus, the lower visibility of motives may partly explain why friends perceive this aspect of personality less accurately and utilize more normative and self-information when making these judgments. Items that were higher in visibility also, unexpectedly, were rated more positively and controlling for item visibility also reduced the magnitude of this effect.

Associations with friendship quality. Does accuracy tend to be greater in higher quality friendships? More accurate perceptions of a friend's motives were significantly associated with greater perceiver- and target-rated friendship quality (see Table 5, accuracy row). Unlike prior research, accuracy for traits was not significantly associated with greater perceiver- or target-rated friendship quality. However, the links between accuracy and friendship quality did not differ significantly as a function of traits versus motives.[4]

Forming more normative impressions of motives and traits, even after controlling for the social desirability of impressions, was associated with greater perceiver- and target-rated friendship quality, and these associations were not significantly different for traits versus motives (see Table 5, normativity row). Somewhat surprisingly, viewing a friend's personality as more socially desirable, controlling for the normativity of impressions, was not significantly associated

Table 4. Effects of Motive Versus Trait and Item Visibility on Impressions Separately and Together.

Personality impression component	Traits vs. motives			Item visibility		
	B	*SE*	*d* [95% CI]	*b*	*SE*	*d* [95% CI]
Separate analyses						
Accuracy	−.07***	.011	−.44 [−.58, −.29]	.07***	.010	.47 [.33, .60]
Normativity	.06*	.030	.21 [.003, .42]	−.12***	.027	−.48 [−.68, −.27]
Social desirability	−.20***	.028	−.52 [−.67, −.38]	.20***	.024	.58 [.45, .72]
Assumed similarity	.09***	.011	.49 [.37, .60]	−.09***	.010	−.55 [−.66, −.44]
Combined analyses						
Accuracy	−.04**	.014	−.24 [−.42, −.07]	.05***	.014	.32 [.15, .49]
Normativity	−.04	.049	−.14 [−.45, .18]	−.12**	.041	−.47 [−.79, −.16]
Social desirability	−.09*	.043	−.24 [−.47, −.02]	.13***	.037	.39 [.18, .60]
Assumed similarity	.05**	.014	.24 [.09, .39]	−.07***	.013	−.55 [−.66, −.44]

Note. Separate analyses refer to examining the effects of either trait versus motives or item visibility on impressions in separate analyses. Combined analyses refer to simultaneously examining the effects of trait versus motives and item visibility on impressions within a single analysis, to examine their independent contributions. *b* = unstandardized regression coefficients; *d* = change in the respective slope for traits versus motives or for a 2-standard deviation change in item visibility (to make comparable with Cohen's *d*; see Gelman, 2008), divided by the perceiver random effect standard deviation for accuracy, normativity, social desirability, or assumed similarity slope; CI = confidence interval.
*$p < .05$. **$p < .01$. ***$p < .001$.

with greater friendship quality for either traits or motives (see Table 5, social desirability row).

Finally, greater assumed similarity was associated with greater perceiver-rated friendship quality for both traits and motives, although the association did tend be larger for motives (see Table 5, assumed similarity row). Being viewed with assumed similarity was significantly associated with target-rated friendship quality for motives but not traits, and this difference was significant.

Overall, then, accuracy, normativity, and assumed similarity in perceptions of traits and motives all showed some positive associations with perceiver- and/or target-reported friendship quality. Generally the strength of the associations did not significantly differ for traits versus motives, but when differences did emerge, associations tended to be stronger for motives than traits. Not only did these associations emerge above and beyond the role of positive impressions, social desirability was not independently significantly associated with friendship quality for either traits or motives.

Discussion

Knowing another person's social motivations—whether they want to form a new romantic relationship or to maintain an existing one, to affiliate with other people or to avoid them, or to obtain status or to blend into the social hierarchy—is useful for predicting that person's behavior, as well as for managing one's relationship to that person. We would expect, then, that people seek to perceive one another's motivations and are able to do so with some accuracy. At the same time, because motivations involve internal information such as thoughts, desires, and plans, they may be more difficult to perceive than personality traits. Indeed, we found that perceivers accurately detected their friend's unique, self-reported ordering of motives (i.e., showing distinctive accuracy), though to a lesser extent than for the big five traits. Furthermore, consistent with the idea that accurate motive perception should benefit relationship processes, we found that greater accuracy for motives was associated with greater perceiver- and target-rated friendship quality. These associations emerged above and beyond normativity, social desirability, and assumed similarity in perceptions of traits and motives. We elaborate upon each of these findings below.

Levels and Differences in Personality Impressions for Motives Versus Traits

Accuracy. Perceivers on average agreed with targets about the target's unique ordering of motives (i.e., they exhibited distinctive accuracy). Compared with levels of accuracy in first impressions ($b = .10$; Human et al., 2013), levels of distinctive accuracy in the current study for both traits ($b = .29$) and motives ($b = .23$) were much higher, as would be expected with well-acquainted dyads. However, although quite high, average levels of accuracy for motives were significantly lower than average levels of accuracy for traits. This was partially driven by visibility: As expected, motives tended to be rated as less observable to others. In turn, lower item visibility was associated with forming less accurate impressions, in line with past work (Funder & Dobroth, 1987; John & Robins, 1993; Watson et al., 2000). Finally, controlling for item visibility substantially reduced the difference in accuracy for traits versus motives. Thus, although motives can be accurately detected by friends, they are likely to be harder to perceive than traits, on average, because they tend to be less visible to others.

Table 5. Perceiver- and Target-Rated Friendship Quality Predicting Accuracy, Normativity, Social Desirability, and Assumed Similarity.

	Friendship quality									
	Perceiver rated					Target rated				
	Traits		Motives		Traits vs. motives	Traits		Motives		Traits vs. motives
Personality impression component	*b* (*SE*)	*d* [95% CI]	*b* (*SE*)	*d* [95% CI]	*Z*	*b* (*SE*)	*d* [95% CI]	*b* (*SE*)	*d* [95% CI]	*Z*
Accuracy	.02† (.013)	.15 [.004, .32]	.04** (.012)	.25 [.10, .40]	1.41	.02 (.013)	.10 [–.08, .25]	.03** (.012)	.21 [.06, .36]	1.55
Normativity	.10*** (.030)	.37 [.15, .56]	.06** (.024)	.23 [.07, .38]	−1.26	.07* (.030)	.23 [.03, .45]	.06** (.024)	.22 [.06, .38]	−0.11
Social desirability	.03 (.028)	.09 [–.05, .23]	.01 (.032)	.04 [–.13, .19]	−0.70	−.03 (.028)	−.08 [–.21, .08]	−.05 (.033)	−.13 [–.29, .04]	−0.67
Assumed similarity	.04* (.015)	.18 [.04, .33]	.06*** (.014)	.29 [.17, .42]	1.82†	.0001 (.015)	.001 [–.15, .16]	.04** (.014)	.22 [.09, .36]	3.80

Note. *b* = unstandardized regression coefficients; *d* = change in the respective slope for a 2-standard deviation change in the friendship quality indicator (to make comparable with Cohen's *d*; see Gelman, 2008), divided by the perceiver random effect standard deviation for accuracy, normativity, social desirability, or assumed similarity slope; CI = confidence interval.
$^{\dagger}p < .10$. *$p < .05$. **$p < .01$. ***$p < .001$.

However, item visibility did not entirely account for the differences in accuracy between traits and motives, suggesting that other factors may contribute to lower accuracy for motives than for traits. For example, motives may be more specific or contextualized than broad personality traits, which may decrease the relevance and availability of cues because there may be fewer contexts in which relevant cues may emerge. For example, whereas an individual who is extroverted may tell jokes, be talkative, and be likely to start conversations across a range of situations, a heterosexual woman who is motivated to obtain a romantic partner may tell jokes *to men*, be talkative *in front of men*, and be likely to start conversations *with men*. Thus, even a well-acquainted perceiver may have less accuracy for a target's motives than personality traits if they do not see them in situations that would enable a particular motive to be expressed.

In addition, although the big five traits generally show high stability over time (e.g., Caspi, Roberts, & Shiner, 2005; McCrae & Costa, 1994), motives may also be harder to judge because they may be more susceptible to change as a function of age and life circumstances (Neel et al., 2016). For example, socioemotional selectivity theory (e.g., Carstensen, 1991; Carstensen, Isaacowitz, & Charles, 1999) suggests that as people age, they experience motivational shifts, such as being more motivated to pursue new relationships in young adulthood and more likely to maintain close relationships and exclude new social partners in older adulthood (Carstensen, 1992). Long- and short-term temporal shifts in motivation may mean that even among well-acquainted pairs, accurate motive detection would be more challenging than personality detection.

Thus far, we have considered differences between motives and traits at the aggregate level, examining how accuracy for motives on average differs from accuracy for traits on average. However, there is of course variability within both traits and motives in terms of their visibility and other characteristics, which may also contribute to differences in levels of accuracy. Indeed, in exploratory analyses, we found that some motives and traits tended to be viewed more accurately than others (see SOM). However, given the early stage of research on accurate motive detection, and the large number of analyses required to look at specific motives, we hesitate to draw strong conclusions about levels of accuracy for individual motives. Instead, we hope that future work will build upon these initial findings to better understand the factors that influence accuracy for motives in general, as well as specific motives.

Normativity. Friends viewed each other highly normatively on average, for both traits ($b = .80$) and motives ($b = .84$), at similar, if slightly lower, levels to those seen in first impressions contexts (e.g., $b = .90$; Human et al., 2013). However, the levels of normativity in friends' perceptions of motives were significantly greater than in their perceptions of traits. This also appeared to be driven by the lower visibility of motives versus traits, as there was no longer a significant difference in normativity between motives and traits when controlling for item visibility. This suggests that, given the lower visibility of motives, people are more likely to rely on and fill in any gaps in their knowledge with normative information when judging motives. This is in line with past work finding that normativity tends to be greater at lower levels of acquaintanceship (Biesanz et al., 2007). However, to our knowledge, this is the first research to show item visibility specifically contributes to the use of greater normative knowledge.

Assumed similarity. We found that perceivers tended to assume their friend shared their own unique motives. This is consistent with past work suggesting that people view others as similar to the self, including on motivational characteristics such as goals (Dunlop et al., 2017). Levels of assumed similarity for motives among friends ($b = .25$) tended to be higher than those seen for traits in first impressions settings (e.g., $b = .10$; Human et al., 2013) and for assumed similarity for traits among friends in the current study ($b = .15$). The difference in assumed similarity for traits versus motives again appeared to be partially driven by the lower visibility of motives. That is, the lower visibility of motives suggests that perceivers lack other information about specific motives and therefore rely on self-information (Ready et al., 2000) to supplement their knowledge of the target, just as people do when judging harder-to-read personality traits (Beer & Watson, 2008; Dawes, 1990; Watson et al., 2000). However, although controlling for item visibility did quite strongly contribute to the differences in assumed similarity for motives versus traits, it did not entirely account for these differences, suggesting there may be other factors at play that may account for the difference. As with accuracy, it may also be that greater change in motives across situations and time contributes to the reliance on more self-information to fill in the gaps. However, it is also possible that motivational processes, such as wanting to believe that one shares similar motives more so than traits, could also account for these differences. This is a question for future research.

Social desirability. Friends also viewed each other in line with the socially desirable personality profile, although the levels were lower than seen in face-to-face first impressions research (bs = .54-.63; Rogers & Biesanz, 2015), and were lower for motives ($b = .07$) than traits ($b = .25$). Item visibility also appeared to contribute to the difference between motives and traits, suggesting that people may be less likely to utilize positive information when judging characteristics that are less visible. However, it is unclear why this would be, and item visibility did not fully account for this difference. As such, additional research is needed to better understand why friends are more likely to view each other's traits versus motives in line with the socially desirable profile and what role item visibility plays in this.

Links With Friendship Quality

Accuracy. Given that accuracy for motives may facilitate intimacy (e.g., De La Ronde & Swann, 1998; Swann et al., 1994), we also predicted (and found) that higher accuracy for motives corresponds to better friendship quality. Indeed, both seeing one's friend accurately and being seen accurately by one's friend were significantly associated with better friendship quality. This is consistent with past work finding that accuracy for personality traits is linked to positive relational processes (Human et al., 2018; Human et al., 2013; Luo & Snider, 2009; Neff & Karney, 2005), even though in the current study we did not find that accuracy for traits was associated with greater friendship quality (although the associations between friendship quality and accuracy did not significantly differ for motives vs. traits).

Greater friendship quality may also promote greater accuracy (Zimmermann et al., 2018). Greater friendship quality may lead friends to exchange more intimate and high quality information, thereby promoting accuracy (Andersen, 1984; Letzring & Human, 2014; Letzring, Wells, & Funder, 2006). This may be especially helpful for less visible motives, which may partially explain why the associations between accuracy and friendship quality were, at least descriptively, stronger for motives than traits. Closer friends may also be more motivated to accurately perceive and express their motives to each other, which is likely to enhance accuracy (Biesanz & Human, 2010). Although the current study is not able to disentangle causality, this suggests accuracy in perceiving a friend's motives and friendship quality is likely to be closely, perhaps bidirectionally, linked.

Normativity and social desirability. Viewing a friend's personality normatively was consistently associated with greater friendship quality, from both the perceiver's and the target's perspective. This is consistent with past work, which has found that more normative impressions are linked to greater liking (Human et al., 2018; Human et al., 2013). Thus, viewing a friend in a more normative manner may contribute to friendship quality, and greater friendship quality may also promote the application of normative knowledge.

However, these findings are inconsistent with work that has disentangled normativity from social desirability, which has instead found that whereas social desirability is positively related to liking, normativity is either unrelated (Rogers & Biesanz, 2015) or negatively related (Wessels et al., 2018; Zimmermann et al., 2018). Furthermore, in the current study, social desirability was not significantly associated with greater friendship quality for either traits or motives. However, the current sample was quite distinct from these past samples, involving dyads that were much closer to each other. Although we might expect social desirability biases to be even more closely linked to friendship quality among closer dyads, given findings in romantic relationships (Murray, Holmes, & Griffin, 1996), perhaps there was a restriction of range in social desirability bias that made it harder to detect links with friendship quality.

Assumed similarity. Viewing a friend as sharing a similar personality profile as the self was also quite consistently linked to greater friendship quality, in line with prior research (Human & Biesanz, 2011b; Human et al., 2013; Morry, 2007; Selfhout et al., 2009; Sunnafrank & Ramirez, 2004). This emerged for both perceivers and targets, suggesting that both assuming similarity and being seen as highly similar may foster greater friendship quality. Alternatively, it may be that people are more willing to assume similarity with or try to appear more similar to those with whom they enjoy relationships. Interestingly, these links tended to be somewhat stronger for motives than traits, perhaps because assuming similarity on motives may more strongly promote a sense of interdependence in one's daily pursuits and preferences than similarity on broader traits. Overall, as with accuracy, normativity and assumed similarity on motives compared with traits appear to be at least as, if not more, closely linked to friendship quality, making it important to examine this dimension of personality more closely in future research.

Future Directions

A strength of the current research is that our sample was relatively diverse in age and friendship length. However, the sample consisted mostly of women, so we could not adequately test for gender differences. Our sample also contained more same-sex than cross-sex friendships. Future work can also sample other cultural contexts (e.g., non-Midwestern, non-majority White).

Having demonstrated that friends can perceive each other's fundamental motives, motive perception in other types of relationships and social interactions should be explored. Some relationship and interaction partners may be more or less attuned to the detection of motives in general and some specific types of motives in particular. For example, an acquaintance might be better at recognizing affiliation or mate-seeking motives to determine whether the target is interested in socializing or seeking a romantic partner, respectively. In contrast, romantic relationship partners might be better at detecting relationship-relevant motives, such as mate retention or kin care motives.

Given that the current research was cross-sectional, it is also unclear whether friendship quality influences personality impressions, whether personality impressions influence friendship quality, or whether there are reciprocal associations over time. Future research should examine these questions longitudinally and/or experimentally to better examine the direction of these associations. Ideally, future work will also use other accuracy validation measures, such as informant- or behavioral-measures, as self-reports are just one, admittedly imperfect (e.g., Vazire, 2010), criterion.

Conclusion

This study offers a foundation for studying accuracy in motive perception by providing evidence that friends can perceive each other's fundamental motives accurately. Furthermore, greater accuracy was positively associated with friendship quality, above and beyond normativity, socially desirability, and assumed similarity. Accurate perception of others' motives may, in turn, facilitate goal attainment, social cooperation, and intimacy. Yet, the current research also suggests that motive perception may be more challenging than trait perception, in part because motives tend to be more internal and therefore less visible to others. Future research should explore the factors that lead to improved and inhibited accuracy for motives.

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Notes

1. One additional community sample dyad was excluded because one member disclosed that she had been drinking alcohol prior to the study.
2. The survey included other assessments, such as measures of individual functioning and well-being, that are not examined here. These assessments are available here: https://osf.io/fhw34/.
3. In addition to friendship quality, we also examined the role of relationship length and created four items to assess perceptions and meta-perceptions of closeness (e.g., "How close do you feel to [name of friend]?"; see Stimulus Materials for Items). Friendship length was generally not significantly associated with impressions, except for accuracy for motives, all $ps < .05$, and all results presented below held controlling for friendship length. The pattern of results with the closeness items was highly similar to the Friendship Qualities Scale (FQS). We therefore focus on the results with the established FQS, although these additional variables and code to run these analyses are available here: osf.io/ns4h9/?view_only=0d1ccb89fd40486eb6a8783aa28a7fdd.
4. We also examined whether perceiver- and target-rated friendship quality significantly interacted to predict greater accuracy but did not find any significant associations for traits, motives, or overall, all $ps > .25$.

Supplemental Material

Supplemental material is available online with this article.

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