Nonverbal Communication and the Vertical Dimension of Social Relations

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Power and status, and related concepts such as dominance and hierarchical position, are not the same though they overlap and share a common theme of ascendancy, potency, or social importance. We will use the term *vertical dimension* (Hall, Coats, & Smith LeBeau, 2005) to encompass a variety of definitions and functional variations, in contrast to the horizontal dimension reflecting socioemotional closeness (Berger, 1994; Osgood, Suci, &Tannenbaum, 1957; Wiggins, 1979).

Verticality can be defined as roles in a formal hierarchy, social influence among friends, privileges of behavior control granted by tradition (parents over children, husbands over wives), accomplishments or endowments in life (education, income), victory in real or symbolic competition, celebrity, respect accorded by others, or the personality trait of dominance, among others. Overlap between these concepts is great; for example, the social status concept has been defined in the same studies as including dominance, importance, prestige, being perceived as commanding and powerful, being perceived as "boss," and being admired and respected (Shariff & Tracy, 2009; Tracy, Shariff, Zhao, & Henrich, 2013). There are, nevertheless, important differences; for example, a person can have status without much explicit power. And there are important distinctions such as different bases of verticality, for example coercive, expert, and reference power (French & Raven, 1959). A person's position on the vertical dimension can be possessed or merely yearned for, wanted or not, legitimate or not. There are also degrees of ecological validity in research on the vertical dimension—from naturally occurring statuses, ranks, and traits, to experimentally created roles, to experimental priming where the "power" concept is only activated cognitively.

By "nonverbal communication" we refer to two broad categories: first, the behaviors that people emit with their face, eyes, body, and voice (independent of the words), and, second, people's accuracy in perceiving others' states, traits, and personal characteristics.

The goal of the chapter is to review how the vertical dimension is related to nonverbal communication—a question that researchers have asked for decades. Important to this discussion is the fact that the person who is high or low in verticality may be experiencing many psychological states—emotions, cognitions, and motives—that may play a role, often an unknown role, in the relation of verticality to nonverbal communication either as mediators or moderators (Hall et al., 2005). As examples of mediators, if bosses are better at decoding facial expressions of emotions than the people below them in the hierarchy, perhaps it is because being a boss motivates a person to know those employees or because being a boss brings more opportunity to hone interpersonal perception skills. Psychological states may also serve as moderators; for example, the relation of verticality to nonverbal communication could be different depending on how people in low and high positions are defining and construing their vertical position (for example, what kind of obligations or privileges it affords, or whether they construe their role as other- or self-oriented).

The fact that verticality has many varieties (Hall, Schmid Mast, & Latu, 2013) is relevant to any discussion of its correlates, but it is especially relevant to nonverbal communication because the ways in which verticality may be associated with nonverbal communication are less obvious than for some other kinds of behavior. Some kinds of behavior are conceptually related to vertical position in straightforward ways and are therefore relatively easy to predict. For example, leaders generally try to engage in behaviors designed to lead, bosses usually tell people what to do, people with dominant personalities generally try to exert influence over other people,

more educated people use big words, and rich people (and those wanting to seem rich) drive fancy cars.

However, prediction in the case of nonverbal communication is harder to make, for two reasons. One is that nonverbal behavior is often ambiguous in its meaning, so that the same behavior may occur in different circumstances or be displayed by different actors for different reasons. A boss might talk in a loud voice in order to convey authority, but a subordinate might talk in a loud voice in order to impress the boss with her assertiveness.

The other reason prediction is hard when it comes to nonverbal communication is that the psychological states alluded to previously (emotions, cognitions, motives) are likely to be key determinants of nonverbal behavior or accurate interpersonal perception (Hall et al., 2005), yet such states are not so easily predicted from the general concept of "verticality," as the following thought experiments illustrate. The motive to appear intelligent could be strong in either high ranking or low ranking individuals, depending on context. Such a motive could determine who has the more serious demeanor, yet without knowing what state the high and low people are in, no prediction about the effect of verticality on serious demeanor could be made. Along the same lines, either a high or low person could be motivated to appear friendly, and either a high or low person could be cognitively overloaded. Wanting to appear friendly might make you smile more and being cognitively loaded might impair your accuracy in perceiving other people's feelings, but no clear prediction from verticality could be made without knowing how eager to appear friendly and how overloaded the high and low people are.

The point is not that nonverbal behavior has an unknown or unknowable relation to verticality—indeed, the remainder of this chapter will summarize what is known—but rather that there are reasons to expect complex and variable associations. Because most studies do not

measure the psychological states that accompany or follow from verticality, or allow a strong inference as to what they are, it is hard to predict what nonverbal cues or what level of interpersonal accuracy to expect. And, because there could be much between-persons variation in such states, verticality effects may wash out (e.g., some bosses may be punitive and some prosocial, even within the same organization) (Galinsky, Gruenfeld, Inesi, & Magee, 2006; Schmid Mast, Jonas, & Hall, 2009). Furthermore, as noted earlier, nonverbal correlates that exist for one definition of verticality may not hold for another (e.g., personality dominance versus rank in an organization). A continuing challenge to research in this area is to move from a general verticality concept to a closer look at the particularities of how it is defined, operationalized, and construed in a given situation.

The present chapter has three main parts. The first part is about people's beliefs (stereotypes) about the connection of verticality to nonverbal communication, people's inferences about verticality based on viewing or listening to excerpts of behavior, and people's embodied self-conceptions of verticality based on their own behavior (and the consequences thereof). The second part reviews how verticality (measured or manipulated) is associated with nonverbal behavior. And the third part takes on the topic of interpersonal accuracy—both the accurate perception of verticality and the relation of a person's verticality to his/her accuracy in perceiving other states and traits in others.

Beliefs and Inferences About How Verticality Is Displayed Nonverbally

People quickly, automatically, and effortlessly make judgments of others' verticality (Oosterhof &Todorov, 2008). When making judgments on this dimension there is great consensus about who appears to have higher vertical position than whom. Research shows that

people hold explicit and reportable beliefs (i.e., stereotypes) about the nonverbal signals of verticality and they apply these when judging others on this dimension.

Beliefs and Stereotypes About Verticality and Nonverbal Behavior

Carney, Hall, and Smith LeBeau (2005) conducted two conceptually identical studies with undergraduate participants that gathered people's stereotypes about verticality differences for 70 nonverbal characteristics and behaviors. Participants were asked to predict the behavior and accuracy of imagined target persons who were high or low either in hierarchical rank in a work setting or in personality dominance. Participants had very clear and consistent beliefs about the nonverbal display of rank and personality, with significant effects occurring across both studies for 35 of the 70 behaviors. Both women and men were believed to express verticality approximately the same way and the beliefs about nonverbal expression did not generally depend on whether verticality was operationalized as hierarchical rank or personality dominance. Among other behaviors, high targets were believed to pay less attention to others (which implies less interpersonal accuracy), handshake more, stand closer, touch others more, have more expressive faces and overall animation, gesture more, gaze more, touch self less, have a more erect posture, lean forward more, and use more open body positions. Interestingly, smiling was not believed to be associated even though it has been theorized to be higher in low than high vertical people (Henley, 1977). Thus, people do think verticality is associated with many nonverbal cues.

The Nonverbal Cues that Implicitly Shape Perception of Verticality

People also have beliefs about the nonverbal expression that may be utilized in an implicit way when judging others' verticality. That is, there is a set of nonverbal behaviors that tend to be present (or absent) when people perceive someone as being high or low on the vertical dimension—but it is unlikely people are explicitly aware of what those behaviors are. Here, we

address behaviors *perceived* to be associated with verticality, based on the meta-analysis by Hall et al. (2005). (This meta-analysis was concerned only with nonverbal displays, not accuracy of interpersonal perception.) In this literature, perceivers rated target persons on the vertical dimension. Then, the nonverbal behaviors of the targets were measured by neutral coders. Those coded behaviors were then correlated with the perceivers' judgments to reveal the cues that predicted their judgments (e.g., Aguinis & Henle, 2001; Burgoon & Le Poire, 1999; Burgoon, Manusov, Mineo, & Hale, 1985; Halberstadt & Saitta, 1987; Hall & Friedman, 1999).

Many nonverbal behaviors predicted higher ratings of verticality, a number of which converge with the explicit beliefs documented in Carney et al. (2005). Across both explicit and implicit beliefs, high vertical people (vs. low vertical people) are thought to: touch themselves less, touch others more, use more arm and hand gestures, have closer interpersonal distances, be more expansive in their body positions and movements, interrupt more during speaking, have shorter time latencies before speaking, use more filled pauses (such as umm and ahh), be more expressive, gaze more overall, and have more postural relaxation. Smiling was also negatively related to the perception of verticality (with more smiling being associated with lower ratings), but when the results for a large group of studies that all used the same facial stimuli were combined into an average effect size, this result disappeared, consistent with the explicit beliefs uncovered by Carney et al. (2005). Finally, there is a strong positive relation between speaking time and perceived high verticality (meta-analysis of Schmid Mast, 2002).

The Embodied Nonverbal Display of Verticality

There is good evidence that engaging in behaviors activates neural circuitry consistent with those behaviors. Darwin (1872) proposed that facial expression can intensify the experience of emotion in his treatise on the expression of emotion in man and animals. While the existence

of embodied cognition has been long known to exist, and research on the bi-directional link between body and mind has been conducted for decades, the term embodiment emerged only recently.

Examples of feedback from the body to psychological states are now many. Wells and Petty (1980) showed that participants were more persuaded by verbal messages when induced to nod versus shake their heads laterally. Strack, Martin, and Stepper (1988) showed that the unobtrusive contraction of the "smile muscle" (zygomaticus major) increased participants' ratings of the funniness of cartoons. Other work has shown that sitting in an upright posture induces pride (Stepper & Strack, 1993), and hunched (vs. upright) physical postures elicit more feelings of helplessness (Riskind & Gotay, 1982).

In the context of the embodiment of verticality, fist clenching increased men's self-ratings on power-related traits (Schubert & Koole, 2009). Also, approach-related behaviors (which are associated with verticality; Keltner, Gruenfeld, & Anderson, 2003) can be increased through touching and pulling (e.g., Briñol & Petty, 2003; Chen & Bargh, 1999; Wegner, Lane, & Dimitri, 1994).

In a more direct test of the embodiment hypothesis in relation to verticality and nonverbal expression, Carney, Cuddy, and Yap (2010) manipulated postures to be expansive-open versus contractive-closed. Expansive-open postures were expected to activate feelings of high verticality and contractive-closed postures were expected to activate feelings of low verticality. Indeed, these postures were found to stimulate differences in feelings of being powerful and in charge, and changes in testosterone and cortisol. Moreover, the expansive-open postures even shaped risk-taking behavior. Overall, it seems that nonverbal displays of verticality cause mental and bodily changes consistent with the effect of verticality itself.

Subsequent work by Huang, Galinsky, Gruenfeld, and Guillory (2011) showed that a pose manipulation was, in fact, even more impactful on approach-related behaviors than role-play and recall-prime manipulations. Additional work also showed that expansive (vs. contractive) postures led to increases in pain tolerance (Bohns & Wiltermuth, 2011). And current research is showing that expansive postures also lead to increases in stress resilience (Carney, Yap, Lucas, Mehta, McGee, & Wilmuth, 2013) and in job interview performance (Cuddy, Wilmuth, Yap, & Carney, 2013). In other words, the nonverbal display of power—acted unobtrusively—appears to impact many systems.

Conclusions and Future Directions Regarding Beliefs, Perceptions, and Embodiment

Explicit beliefs about verticality and nonverbal communication converge rather well with more implicitly measured associations—that is, perceptions of verticality based on viewing nonverbal cues. With regard to the embodiment of verticality, the "power pose" work only examined the expansiveness dimension and future research must explore whether other verticality-related behaviors such as speaking time (Schmid Mast, 2002), interruptions, and the visual dominance ratio (Dovidio & Ellyson, 1985) also may be able to produce feelings and subsequent behaviors consistent with verticality. Also, no experiment has systematically varied participants' awareness of the pose manipulation to determine if awareness that one is "doing a power pose" disrupts (or perhaps enhances) the phenomenon.

It is interesting that the nonverbal display of power in belief, perception, or embodiment, overlaps considerably with nonverbal cues associated with pride, particularly with respect to expansive-open vs. contractive-closed postures. Tracy and colleagues have shown that an expansive nonverbal display is associated with pride—even in the blind (Tracy & Matsumoto, 2008). The displays are so close, in fact, that research has shown the pride display to activate

mental concepts associated with verticality (Shariff & Tracy, 2009; Shariff, Tracy, & Markusoff, 2012; Tracy, Shariff, Zhao, & Henrich, 2013). Pride, then, can trigger nonverbal displays that, in turn, influence others' perceptions along the verticality dimension and likely have feedback effects such as seen in the "power pose" research.

Nonverbal Behavior and Actual Verticality

Now we move to nonverbal behavior correlates of actual verticality—how nonverbal behavior differs, or not, between people who have different degrees of verticality. We focus on the meta-analysis of Hall et al. (2005) in which verticality was defined in terms of personality dominance, power roles or rank, and socioeconomic status (SES); both experimentally manipulated and pre-existing verticality definitions were included. In this meta-analysis, the indicator of effect size was the Pearson correlation (r), signed so that positive values meant that higher vertical people displayed more of the behavior and negative values meant the reverse.

The significant effects (Table 1) showed that higher vertical people used more open body positions, had closer interpersonal distances to others, were more facially expressive, spoke more loudly, engaged in more successful interruptions, had less vocal variability compared to lower vertical people, and were better able to pose emotional expressions in the face and voice. The amount of time a person speaks during a social interaction is also a valid cue to a high position on the vertical dimension and is, indeed, a more consistent and strong cue than most of the cues mentioned above. Meta-analytic evidence shows that superiors talk more than their subordinates, people in high power roles talk more than people in low power roles, and the more a person is dominant as a personality trait, the more he or she talks during an interaction (Schmid Mast, 2002).

Importantly, for several of these behaviors there was significant heterogeneity, meaning that variation among the effect sizes was greater, often much greater, than expected by sampling variation. Efforts to uncover moderator effects were generally not successful.

Table 1 also shows that for a number of behaviors, including some for which there are believed and perceived verticality differences, there was no evidence of an actual verticality effect. Though the small number of studies for some behaviors prevented strong conclusions, the non-significant effects were very small in magnitude while often being significantly heterogeneous. For both smiling and gazing, for example, the average effects were negligible but there was extreme variation, with effects that were both positive and negative. Note, the lack of an overall smiling effect is consistent with the believed and perceived results described earlier and is contrary to earlier theorizing (Henley, 1977). Although overall gaze showed no overall relation to verticality, the gaze pattern called the Visual Dominance Ratio (VDR) has a robust tradition of findings. The VDR is defined as the percentage of gaze at an interaction partner while speaking divided by the percentage of gaze while listening; a high VDR gives the impression of less conversational attentiveness (Dovidio & Ellyson, 1985). Research has clearly demonstrated that higher verticality is associated with a higher VDR for both men and women and for a variety of definitions, such as personal expertise on a topic (Dovidio, Ellyson, Keating, Heltman, & Brown, 1988), objectively measured rank (Exline, Ellyson, & Long, 1975), experimentally ascribed status (Ellyson, Dovidio, Corson, & Vinicur, 1980), and personality dominance (Ellyson et al., 1980).

The example of the VDR demonstrates that an effect for the overall behavior—in this case, overall gazing—might be negligible while an effect for a more precisely defined and nuanced behavior pattern might be easily detectable as a correlate of verticality. Another such

illustration, also for gazing, is for the "prolonged gaze pattern": both emergent and appointed leaders in three-person groups chose the next speaker by engaging in prolonged gazing at that person as the leader nears the moment of yielding the floor (Kalma, 1992). Both this and the VDR are likely strong, yet subtle, methods of nonverbal social influence related to verticality.

One important kind of moderator that the meta-analysis could not address was the salience of their vertical position to the people being observed. The relative verticality of two people may sometimes be the overriding dimension of relationship (the example of master and slave comes to mind), but sometimes there may be multiple dimensions or functions to an interpersonal relationship among which verticality is only one, and perhaps not the most important one in producing behavioral effects. For example, two best friends may differ greatly in social class or occupational prestige, yet these differences play little role in how they behave with each other; indeed, they may go to pains not to let this happen. With many studies in this literature being on college students, the verticality differences that existed (whether manipulated or naturally occurring) may have been not very salient or important and therefore might have exerted weak influences on nonverbal behavior. More studies of ecologically meaningful verticality, such as that of Dean, Willis, and Hewitt (1975) on interaction distances between men holding differing military ranks, are needed.

Several other important questions were not, or could not, be addressed in Hall et al.'s (2005) meta-analysis. The only effects summarized were main effects of the actor's verticality. Some studies in the literature have also found target effects, that is, people treat high and low vertical people differently. Curvilinear effects have also been found and these are, in fact, probably ubiquitous in life (highest or lowest levels of the behavior occurring in equal compared to unequal verticality interactions). Dean et al. (1975) found both such trends for interaction

distance between military personnel of different ranks. Other limitations of the meta-analysis should be noted. One is that in actual interaction it is likely that people reveal or display their high or low verticality in multiple behaviors simultaneously. Analyzing behaviors individually probably yields effects that are smaller than would be obtained if several behaviors were considered at once.

Also, many one-of-a-kind studies have been done. We already mentioned Kalma's (1992) study on the prolonged gaze pattern, and other examples include Gifford's (1994) finding that people higher in personality dominance engaged in less object manipulation, and Kraus and Keltner (2009)'s finding that a person higher in SES was more likely to disengage nonverbally during an interaction with a person of lower SES (more self-grooming, object manipulation, doodling) and also to do less gazing, laughing, and nodding. The fact that Gifford's (1994) study on dominant personality and Kraus and Keltner's (2009) study on SES contradict each other on object manipulation highlights the difficulties in finding consistent patterns in this literature.

In another unique study, Kraus and Chen (2013) examined physical dominance in relation to smiling, finding that contenders in mixed martial arts contests were more likely to win if they did not smile in a posed photograph taken prior to the bout (posing in a fighting stance with their competitor). This could indicate that smiling leaked the losing fighter's feelings of weakness, nervousness, or reduced aggressive intentions, or it could indicate that not putting on an intimidating facial expression gives the opponent a psychological advantage. In this instance, as in many other studies, the causal paths and mediators are unclear.

Conclusions and Future Directions Regarding Nonverbal Behavior and Actual Verticality

Much more research is needed on how a person's vertical position is related to his/her nonverbal behavior. Much of the literature is correlational, meaning causal paths are often

unclear. Mediating mechanisms are virtually unknown, meaning we cannot answer important questions such as *why* are higher vertical individuals more accurate in expressing emotions through nonverbal cues (Table 1)? Also the inconsistency between results of studies demands focused research on moderating factors: why do some studies find opposite results from other studies?

Verticality and Accuracy of Interpersonal Perception

For the reminder of the chapter we focus on interpersonal accuracy, defined as the precision with which people infer or recall other people's states, traits, personal attributes, or behavior. We focus both on how accurate people are when inferring other people's vertical position position ("who's the boss" in a social setting) and on how one's own vertical position influences the extent to which that individual is accurate when inferring and recalling other people's states or traits.

Accuracy of Perceiving Verticality

How accurate are people in judging "who's the boss" in social situations? Being able to judge others' verticality is an especially important skill, given its highly adaptive value. Knowing who the "boss" is makes it easier to communicate efficiently in order to achieve one's goals (e.g., address those who have the resources). Such knowledge also helps maintain the existing social order. So if this skill is highly adaptive, are people good at it? As mentioned in a previous section, not all cues that people use to infer another's verticality are actually valid. Still, despite using some inaccurate cues, research shows that people can assess others' vertical position better than chance level and can, in fact, be quite accurate. For example, perceivers who looked at photographs of two university employees were better than chance at inferring the relative status of the two people in the picture (Schmid Mast & Hall, 2004). Similarly, perceivers

were able to identify accurately which of two target people was the boss based on photographs (Sternberg & Smith, 1985).

Ratings of others' personality dominance may also be quite accurate. In one study, perceivers' ratings of CEOs' dominance based on their photographs significantly predicted the CEOs' companies' earnings (Rule & Ambady, 2008). This result may be an indirect indicator of accuracy in judging dominance if the CEOs' dominance was responsible for the performance of the company. Recent evidence also suggests that dominance cues are processed similarly across different cultures (Bente, Leuschner, Al Issa, & Blascovich, 2010; Rule, Ishii, & Ambady, 2011), although verticality relations are more clearly displayed through nonverbal behavior in some countries (e.g., Germany) than others (e.g., United States, United Arab Emirates; Bente et al., 2010).

The ability to assess verticality in others seems to occur early in development (Antonakis & Dalgas, 2009). Children were presented with pairs of photographs depicting real politicians involved in a past election. Their task was to decide which one of the two men they would choose as a captain of a boat in a computer-simulated game involving a boat trip. Children's decisions reliably predicted actual election results (i.e., which of the two candidates was actually elected) and were not significantly different in their accuracy compared to the decisions of adults. The ability to mentally represent social dominance and power can occur even in preverbal infants: as early as 10 months old, infants were able to use the relative size of non-human agents to mentally represent dominance and predict which agent would win in a contest (Thomsen, Frankenhuis, Ingold-Smith, & Carey, 2011).

Thus, people can be quite accurate overall in their verticality assessments, even though there are few specific nonverbal behaviors that are consistently indicative of actual verticality

(see Table 1). Moreover, some nonverbal cues are perceived to be significantly related to verticality (e.g., smiling, other-touch), when in fact they are not related overall to actual verticality (Hall et al., 2005). This conundrum may be explained if we consider that it may not be single cues that predict accuracy, but rather a pattern or combination of different cues and the absence of others. In other words, assessing verticality may be a Gestalt-like impression formation process. For example, a nonverbal behavior pattern involving touching, pointing at the other, invading space, and standing over the other has been related to perceived dominance (Henley & Harmon, 1985). Thus, people may be accurate not necessarily because they can judge individual cues accurately; instead, what matters is the manner in which they weigh the relevance of each nonverbal cue in the given context.

The Perceiver's Verticality and Accurate Perception

For decades, there has been an ongoing debate in the literature: who is better at "reading" others? Are high vertical people more interpersonally accurate than low vertical people, or vice versa? More than 90 studies directly tested this research question (for a meta-analytic review, see Hall, Schmid Mast, & Latu, 2013. In these studies people (perceivers) make inferences about others' (targets') states or traits, either in a controlled *testing paradigm* (in which participants infer people's states based on videos, photographs, or other recorded material) or, to a lesser extent, in the context of actual social interactions in which participants infer other people's states after actually interacting with them – the *in vivo paradigm*. Accuracy tests in the testing paradigm are scored against a "correct" criterion and can include established instruments such as the Profile of Nonverbal Sensitivity (PONS; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979) or the Diagnostic Analysis of Nonverbal Accuracy (DANVA; Nowicki& Duke, 1994). In the *in vivo* paradigm, people are asked to make judgments about others during or following an

interaction, with the criterion being the self-ratings made by the partner-target (e.g., the perceiver is asked how their interaction partner felt, and their answer is compared against the partner's self-ratings of his/her affective state).

For the most part, this research focused on how people make *inferences* about other people, particularly how people infer the affective states of others. A different type of accuracy that is measured in this literature is accuracy of *recalling information* about another person, such as the words that the target person said or wrote, or the person's nonverbal cues.

Individual studies have found support for both hypotheses: that low vertical people are more accurate than the high and that high vertical people are more accurate than the low. For the reminder of the chapter we will describe these two opposing views and the empirical findings that support them, for both the testing paradigm and the *in vivo* paradigm. We additionally discuss possible moderators of this relationship, as well as the gaps and possible future directions in this line of research. The following section discusses studies in the testing paradigm and *in vivo* studies will be discussed in a later section. However, the theoretical arguments generally apply to both.

Low vertical people are more accurate than high vertical people. One view is that low vertical people are more accurate than the high at perceiving others, primarily because it is adaptive for them to be accurate. For example, subordinates may be motivated to discern and learn their superiors' intentions, moods, and desires. By knowing these states, superiors may become more predictable, which would help subordinates to adjust their own behavior in order to achieve their desired goals. Thus, accurate interpersonal perception becomes an adaptive skill for those with a power disadvantage (Thomas, Franks, & Calonico, 1972; Henley, 1977).

If low vertical people have an advantage in terms of accuracy, this effect may also be driven by the high people being especially low in accuracy. Perhaps high vertical people do not need to be accurate, do not want to be accurate, or do not have the cognitive capacity to be accurate (Fiske, 1993; Russell & Fiske, 2010). Given that they do not depend on others and they control relevant resources, high vertical people may not be motivated to know subordinates' feelings, thoughts, or expectations. Alternatively, because of high cognitive demands that come with some high vertical positions, such people may not have the cognitive capacity to attend to the feelings and behaviors of others.

The hypothesis that high vertical people are less accurate than the low was supported in some studies, for different definitions of verticality: an experimental priming induction decreased the ability to recognize others' emotions (Galinsky et al., 2006), personality dominance was negatively correlated with emotion recognition (Moeller, Ewing Lee, & Robinson, 2011), and high SES was associated with reduced empathic accuracy (Kraus, Côté, & Keltner, 2010). Low vertical people were also found to be more accurate in recalling information about others, such as who made a sexist remark in an online discussion (Barreto, Ellemers, & Fiske, 2010).

High vertical people are more accurate than low vertical people. Still other studies found the opposite: high vertical people were more accurate. Such people may be motivated to know others because others depend on them and because otherwise they would lose the respect and support of their followers, as argued by Hall and Halberstadt (1997) and Hall et al. (1997). They need to be accurate in order to lead others who accorded them their position. This other-orientation of high vertical people was supported by Schmid Mast, Jonas, and Hall (2009), who found that for high vertical people, the positive effect on interpersonal accuracy was mediated by felt pride and felt respect.

Alternatively, rather than high verticality making people accurate, accuracy may produce high verticality—in other words, people who have this skill are better able to achieve those high positions. This view is especially prevalent in the organizational and leadership literature (Riggio, 2001), where it is generally assumed that people become leaders in part because of this interpersonal skill.

From a cognition perspective, high vertical people may be more accurate because they use a global rather than local processing style: they focus on the big picture (Schmid & Schmid Mast, 2012), a strategy that can facilitate facial emotion recognition in certain circumstances (Schmid, Schmid Mast, Bombari, Mast, & Lobmeier, 2011).

Finally, it could also be argued that low vertical people, for various reasons, are especially low in accuracy, and this drives the advantage that high vertical people have in terms of accuracy. Individuals low in verticality may be too demoralized or too cognitively loaded to be accurate. Although these mediators have not been studied directly, there is evidence that decreased motivation, negative affect, and high cognitive load can impair performance on interpersonal accuracy tasks (e.g., Ambady & Gray, 2002; Horgan & Smith, 2006; Phillips, Tunstall, & Channon, 2007).

The hypothesis that the high people are more accurate than the low is supported, for example, in the studies by Schmid Mast et al. (2009), and in the meta-analysis it was supported especially within two categories of this research: the relation of SES to the accuracy of making inferences and the effect of experimentally manipulated power on recall of interpersonal information, both in the testing paradigm. Higher SES was associated with higher accuracy in judging emotions using vocal cues, but also cues from the face and the body (Pfaff, 1954; Rosenthal et al., 1979; Stokes, 1983; Alvarez & Fuentes, 1994). Experimentally manipulated

vertical position similarly showed a significantly positive effect on recall of information about other people, such that high vertical individuals remembered more of others' words compared to individuals assigned to low roles (Overbeck & Park, 2001; Saenz & Lord, 1989).

It all depends: Effects of moderators. It can also be argued, as suggested earlier in this chapter, that it is unlikely that the relation between verticality and accuracy is consistent across situations. Instead, high vertical people might or might not be interpersonally accurate compared to low vertical people, depending on other factors. Indeed, the meta-analysis showed great heterogeneity across studies in the verticality-accuracy relationship and type of personality dominance (prosocial/responsible versus egoistic/aggressive) was a significant moderator. Different moderator variables may influence the direction of this relationship: goals (prosocial versus egoistic, helpful versus punitive), different types of interpersonal accuracy (e.g., lie detection, personality assessment, inference about status), emotional states (positive versus negative), cognitive load, or motivation (Galinsky et al., 2006; Hall, Carter, & Horgan, 2001; Kraus et al., 2010; Russell & Fiske, 2010; Schmid Mast et al., 2009).

Despite moderators being suggested by a number of authors, there have not been many deliberate tests of this hypothesis. One exception comes from Schmid Mast et al. (2009), who directly tested moderators by experimentally manipulating empathic versus egoistic mindset for high vertical participants. Findings showed that empathic orientation led to higher accuracy of decoding nonverbal affective cues compared to egoistic orientation.

Verticality and accuracy in the *in vivo* paradigm. Studies have also investigated this relationship in the context of social interactions (*in vivo)*. A number of these studies suggest that there is a tendency for low vertical individuals to be more accurate than high vertical individuals (e.g., Delgado-Hachey & Miller, 1993; Kraus et al., 2010; Letzring, 2008). However, these

findings should be interpreted with caution, given a methodological issue that has profound implications. Accurate perception of another individual depends not only on how accurate the perceiver is, but also on how expressive the target person is – whether the cues from the target are clear and recognizable. If targets do not express their feelings, attitudes, or opinions, this has a negative effect on the accuracy of the perceiver in decoding those states. Conversely, if targets are "an open book" – they clearly express their emotions and attitudes – perceivers are more likely to be accurate too. Therefore, in the *in vivo* tradition, accuracy is typically fully confounded between the perceiver's perceptivity and the partner-target's expressivity, as pointed out by a number of previous authors (Alkire, Collum, Kaswan, & Love, 1968; Hall, Rosip, Smith LeBeau, Horgan, & Carter, 2006; Noller, 1980; Snodgrass, Hecht, & Ploutz-Snyder, 1998).

Only three studies (Alkire et al., 1968; Snodgrass et al., 1998; Hall et al., 2006) fully addressed the issue of this confound, by measuring the expressivity or communication clarity of the targets' message using independent raters who performed the same judgment task as the original perceiver member of the dyad did. For example, Alkire et al.(1968) had college sorority members and pledges (those wishing to join) participate in a dyadic task in which they had to describe the shapes of figures to the partner without the partner seeing the figures. Initial results showed that sorority members were more accurate in perceiving the message coming from the pledges than vice versa. Independent participants were asked to listen to the audiotapes of these interactions and to perform the same accuracy task as the actual participants of the study. Data from these independent listeners showed that the sorority members were less clear in communicating their messages. In the light of this finding, the authors concluded that the lower accuracy of the pledges might not be due to their being lower in vertical position, but rather to the decreased clarity of the message. Similarly, in Snodgrass et al. (1998) and Hall et al. (2006),

correcting for the target's expressivity revealed that perceivers' accuracy was accounted for by the expressive clarity of the partners.

The remaining studies in the *in vivo* tradition either did not control for expressive clarity or did not do so in an ideal manner (Gonzaga et al., 2008; Kraus et al., 2010). For example, in Kraus et al., the authors measured and controlled for the overall expressiveness of the target person who emitted the message and not for the clarity of the actual message that was decoded. Because of this methodological issue, it is difficult to draw definite conclusions about the verticality-accuracy relationship based on studies that used the *in vivo* paradigm. Future research should correctly control for the clarity of the targets' communication in order to obtain an unbiased measure of how the verticality of perceivers is related to their accuracy in decoding those messages.

Conclusions and Future Directions Regarding Accuracy

The existing literature reveals that there is no clear overall advantage for higher or lower vertical individuals to be generally more accurate, but rather that whether this will be the case depends on what definitions of verticality and accuracy are used. And when meta-analytic trends or individual studies are significant, there is still little known about what mediating mechanisms might be accounting for the effects. Though it might be disappointing that sweeping conclusions are not possible, finding a complicated picture should not be such a surprise considering how many operational definitions of the verticality concept there are and the very different psychological states that might be caused by, or accompany, them. Identifying the factors that moderate verticality-accuracy relations should be a major goal for research.

One additional problem is that we do not know where the locus of this effect is – if high people have an advantage, is it because they are more accurate or because low people are less

accurate? Similarly, if low vertical people have an advantage, is it because high people are less accurate or low people are more accurate? One way to address this issue is to compare high individuals not only with low individuals (as is almost always done in the literature), but also with condition of neutral verticality or some other kind of control condition. In one of the only studies that addressed this issue, the accuracy of people assigned to a neutral-vertical condition was closer to the level of accuracy of low vertical people, suggesting that it is high vertical position that increased accuracy of emotion recognition rather than low position decreasing it (Schmid Mast et al., 2009). However, more evidence is needed to investigate the locus of the effect.

Given that the current findings are not homogeneous, it is not surprising that researchers have not focused on mediators – an effect usually needs to be firmly established before investigating its mechanism. Future studies should, however, directly test the meditational variables that have been suggested as mechanisms: motivation, emotion, cognitive load, cognitive capacity, processing style, etc.

Finally, future studies should consider investigating accuracy in perceiving other states rather than affect, which was the content of the accuracy measurements in the vast majority of available studies. Other possibilities may include accuracy in inferring targets' personality traits, attitudes and opinions, intelligence level, or interpersonal relationships. The literature offers little theoretical justification for why judging emotions is chosen almost universally as the content of accuracy judgments.

Closing

Across humans and other animals, high vertical position means advantaged and extended survival. Because our very survival depends greatly on having some power (or one of its

variants, e.g., status, reputation, class, prestige, etc.) or knowing who does, humans think about power a lot, practice having it, nonverbally signal it, try to figure out who has it, and try to discern what both the high and the low are feeling and thinking. A puzzle yet unsolved about the nonverbal communication of verticality is why it is people can accurately detect who has it and who doesn't, yet there are few nonverbal behaviors that are consistently indicative of verticality in humans. One possible answer is that there are many ways to show one's vertical position but instead of being universal cues, some are much more relevant in certain contexts. Also, several weak cues can be a potent signal if they combine. And, of course, research has not yet measured all the possibly relevant behaviors, especially not all at once. Nonverbal measurement is laborious, meaning that a researcher might unknowingly not measure the nonverbal cue that would be especially diagnostic in a given context.

Another unsolved puzzle concerns the link between a perceiver's vertical position and his/her accuracy. There is great inconsistency in this literature. It would be good to know which features of the situation, judgment, or process (or all three) are influencing a person's ability to accurately judge the traits, states, goals, and intentions of others.

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Table 1

Nonverbal Behaviors in Relation to Actual Verticality (from Hall, Coats, & Smith LeBeau, 2005)

Behavior	Number of studies	Mean effect size (*r*)
Significant effects		
Open position	8	.13*
Interpersonal distance	11	-.17***
Facial expressiveness	2	.24**
Loudness	3	.24***
Successful interruptions	13	.22***
Vocal variability	1	-.27**
Posed emotion encoding	4	.31***
Nonsignificant effects		
Smiling	22	-.03
Gazing	11	-.01
Nodding	5	.06
Self-touch	6	.00
Other-touch	3	.03
Hand/arm gestures	9	.02
Relaxed posture	10	.02
Back-channel	5	.03
Speech errors	4	.02
Speech rate	3	-.06
Pitch	2	-.05

Behavior	Number of studies	Mean effect size (*r*)
Posed emotion encoding	4	.31***

Note: Based on studies with reported or calculable effect sizes. Positive effect sizes mean that higher vertical people displayed more of the behavior and negative values mean the reverse.

[a]Back-channel responses, also called listener responses, are brief acknowledgments such as "mm-hmm" made while another person has the speaking floor.