

Accurate Social Perception at Zero Acquaintance: The Affordances of a Gibsonian Approach

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We review research on accurate social perception at zero acquaintance and apply a Gibsonian ecological approach to redress several shortcomings. We argue that recent use of Brunswik's lens model to determine what physical qualities accurately communicate psychological traits has limited utility because it fails to consider the structured information provided by configural physical qualities that is central to Gibson's (1979) theory. We elaborate a developmental model of relationships between physical and psychological qualities that highlights research needed to identify configural physical qualities that may inform accurate perceptions. This model and tenets of the ecological theory yield several hypotheses regarding such qualities. Finally, we advocate the value of studying perceived affordances (opportunities for acting, interacting, or being acted upon) because this will focus attention on the neglected issue of contextual influences on social perception accuracy, and because affordances may be perceived more accurately than global personality traits.

In the early 1980s, McArthur and Baron (1983) proposed a Gibsonian ecological approach to social perception that had two primary goals. The first goal was to direct researchers' attention to the adaptive function and consequent accuracy of social perception rather than to the errors in perception that then dominated research in the field. The second goal was to direct attention to the external sources of stimulation in people's appearance, movement, and voice that inform social perception rather than to the inferential processes in the perceiver that then dominated the field. (For ease of exposition, these sources of stimulation will be referred to as *physical qualities*.) There has been considerable progress toward the first of these goals since that article was published. Indeed, there has been a veritable paradigm shift with the waning of research on errors and biases and the waxing of research on accuracy. Progress toward the second goal, on the other hand, has been limited. This is partly due to the fact that relatively little research has been devoted to the question of what physical qualities inform accurate perception. However, the slow progress toward this second goal also reflects theoretical and methodological shortcomings in

the existing research. Shortcomings in current research include the following: (a) no guiding theory for predicting what physical qualities will communicate what psychological qualities, (b) lack of attention to configural physical qualities as opposed to isolated cues, and (c) insufficient consideration of contextual influences on the accuracy of social perception. The Gibsonian theoretical framework will be applied in this article to redress these shortcomings.¹

Although we would like to think that the McArthur and Baron (1983) article played some causal role in the shift from a social perception paradigm that focused on error to one that focused on accuracy, the fact is that many other researchers independently made strong arguments on behalf of accuracy shortly after that article was published. Thus, Swann (1984) noted that perceivers are often concerned only with the accuracy of their impressions in circumscribed situations, where the dynamics of a social interaction often may lead them to be correct. Funder (1987) noted that perceptions should not be viewed as "mistakes" merely because they are wrong in relation to a laboratory stimulus, because they may reflect processes that lead to accurate perceptions in more ecologically valid situations. Kenny and his colleagues (e.g., Kenny & Albright, 1987) used the social relations model to document consensus in first impressions among strangers and to establish the extent to which that consensus reflected the target of percep-

Preparation of this article was supported by National Institute of Mental Health Grant MH42684 and a Visiting Erskine Fellowship from the University of Canterbury, Christchurch, New Zealand.

We thank Dean Owen, Garth Fletcher, and Lucy Johnston for stimulating discussions and helpful comments on earlier drafts of this article.

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¹For other recent applications of Gibsonian theory to social perception, see Baron (1995), Berry and Finch-Wero (1993), and Niemann and Secord (1995).

tion. Researchers interested in stereotyping developed models that allowed for accurate impressions via the active processing of the available information rather than category-based impressions (Brewer, 1988; Fiske & Neuberg, 1990). And, most recently, serious attention has been given to the accuracy of group stereotypes (Y. T. Lee, Jussim, & McCauley, 1995). In addition to the burgeoning attention to accuracy, there also has been a resurgence of functional approaches to social perception that are consistent with Gibson's ecological canon that "perceiving is for doing" (Fiske, 1992; Gangestad, Simpson, DiGeronimo, & Biek, 1992; Gibson, 1979).

This article has five purposes. First, we briefly review current evidence on the accuracy of trait perceptions. This review is restricted to the research on accuracy at zero acquaintance in which perception is based solely on the physical qualities of appearance, movement, or voice. Second, we consider relationships between physical and psychological qualities that have been shown using Brunswik's (1955, 1956) lens model, and we advocate a more theoretical and configural approach. Third, we provide a developmental model that illustrates how physical and psychological qualities may come to be related. Fourth, this model and tenets of the ecological theory of social perception lead us to propose various configurations of physical qualities that may produce accurate social perception. Finally, we advocate the value of studying not only the accuracy of perceived traits but also the accuracy of perceived affordances that highlight contextual influences on social perception accuracy.

Evidence for the Accuracy of Social Perception

Most researchers investigating the accuracy of social perception have focused on perceiving the "Big Five" personality traits: extraversion, agreeableness, conscientiousness, emotional stability, and culture (John, 1990; McCrae & Costa, 1987; Norman, 1963). Some have investigated the perception of personality traits drawn from other taxonomies, such as the circumplex model (Wiggins, 1979). This model specifies eight interpersonal traits defined by four orthogonal dimensions, two of which (submissive/dominant and agreeable/quarrelsome) have been interpreted by some theorists as capturing the extraversion and agreeableness factors of the Big Five (McCrae & Costa, 1989; Peabody & Goldberg, 1989). The traits in these taxonomies are of interest because they appear to capture both the organization of people's perceptions of others as well as their self-perceptions and actual behaviors (e.g., Gifford & O'Connor, 1987), which suggests that people not only are perceived to differ along these dimensions but also really do differ in these ways. Still other researchers have taken a functional perspective. These

investigators have suggested that people should be most attuned to those traits whose correct or incorrect identification had implications for actions relevant to survival and reproduction in our evolutionary past, such as sexual availability and social dominance (Gangestad et al., 1992).

In stark contrast to the dismal portrait of an error-prone social perceiver painted during the 1970s and early 1980s (e.g., Nisbett & Ross, 1980), recent research has provided considerable evidence for accurate perceptions of some of the aforementioned traits. What makes this evidence particularly impressive is that accuracy occurs with very minimal information (cf. Ambady & Rosenthal, 1992). One robust finding is that there is consensual agreement when people form impressions of others from facial photographs, from brief videotapes, or after spending a short time together in small groups. (See Kenny, Albright, Malloy, & Kashy, 1994, for a review of research on consensual judgments of the Big Five traits at zero acquaintance.) Of course this "consensus at zero acquaintance" in strangers' social perceptions could reflect shared physical stereotypes rather than revealing perceivers' accurate perceptions of people's traits. However, evidence for the accuracy of strangers' consensual perceptions has been provided by their convergence with perceptions of friends or acquaintances, with personality measures, with actual behaviors, and with self-reports whose validity has often been shown by convergence with behavioral measures (e.g., Gifford & O'Connor, 1987; Moskowitz, 1990).

Table 1 provides a summary of illustrative investigations of accuracy in perceiving agreeableness, conscientiousness, dominance, extraversion, and honesty. It should be noted that all of these investigations also provide evidence of consensus, as reflected in high interjudge reliabilities in trait ratings. The studies included in this overview of the accuracy literature provided only nonverbal information about the person being judged: facial photographs, vocal cues in standardized statements, and dynamic movement cues exhibited by a person alone or in a group setting. It is not appropriate to average the effect sizes across studies because many are based on correlated multiple measures within a given study. However, it can be seen that the effects that are reported are not trivial, and they are consistently in the moderate range for the traits of extraversion and dominance. Moreover, moderate accuracy effects in studies by Berry (1990a, 1991) and Gangestad et al. (1992) that have been coded in Table 1 as agreeableness may also reflect accuracy in judging extraversion, because measures employed in these studies could be taken as indicators of extraversion rather than agreeableness—for example, ratings of "affectionate," "gregarious," "people oriented," "warm," and "likelihood of turning a cold shoulder to attempts at friendly conversation."

Table 1. *Illustrative Investigations of Accurate Social Perception at Zero Acquaintance*

Study	Information About Target Provided to Judges	Accuracy Criterion	Effect Sizes (<i>r</i>) for Five Traits				
			Agr	Con	Dom	Ext	Hon
Berry (1990a, Study 1)	Facial photo ^a	9-Week acquaintance ratings	.39		.37		.42
Berry (1990a, Study 2)	Facial photo	Self-ratings (male/female)	.45/.25		.45		
		MPQ ^b social closeness (male/female)	.45/.00				
		MPQ social potency			.43		
		MPQ aggression			.45		
		Rathus assertiveness			.38		
		Self-ratings (male/female)	.37/.10		.47/.35		
		MPQ social closeness (male/female)	.32/-.15				
		Rathus assertiveness (male/female)			.53/.26		
		MPQ social potency (male/female)			.36/.32		
		MPQ aggression (male/female)			.33/.11		
Berry (1991)	Facial photo	Self-ratings (male/female)	.37/.10		.47/.35		
		MPQ social closeness (male/female)	.32/-.15				
		Rathus assertiveness (male/female)			.53/.26		
		MPQ social potency (male/female)			.36/.32		
		MPQ aggression (male/female)			.33/.11		
	Alphabet recital	Self-ratings (male/female)	-.16/.10		.14/.43		
		MPQ social closeness (male/female)	.14/.35				
		Rathus assertiveness (male/female)			.31/.13		
		MPQ social potency (male/female)			.15/.13		
		MPQ aggression (male/female)			.05/.32		
		Agree to dishonest behavior					.20
C. F. Bond, Berry, & Omar (1994)	Facial photo	Agree to dishonest behavior					.20
Borkenau & Liebler (1992, 1993b)	90 sec sound video, whole body, walking, reading standard text	Self-ratings, Norman ^c (male/female)	.13/.12	.25/.25		.42/.16	
		Self-ratings, NEO ^d (male/female)	.35/.08	.25/.22		.51/.37	
	90 sec silent video, whole body, walking, reading standard text	Self-ratings, Norman (male/female)	.06/.16	.33/.31		.41/.19	
		Self-ratings, NEO (male/female)	.17/.10	.25/.37		.47/.28	
	Facial photo	Self-ratings, Norman	.06	.27		.33	
		Self-ratings, NEO	.19	.32		.33	
	Audio tape, reading standard text	Self-ratings, Norman	.07	.09		.36	
		Self-ratings, NEO	.21	.10		.33	
	90 sec sound video, whole body, walking, reading standard text	Partner-ratings, Norman ^e	.10	.19		.16	
		Partner-ratings, NEO	.07	.14		.19	
Borkenau & Liebler (1993b)	90 sec sound video, whole body, walking, reading standard text	Partner-ratings, Norman	-.01	.15		.14	
		Partner-ratings, NEO	-.08	.25		.13	
	Facial photo	Identifying high/low Machs			.14		
		Identifying high/low Machs			.30		
Cherulnick, Way, Ames, & Hutto (1981)	60 sec silent video of target being interviewed	Identifying high/low Machs			.30		
Cherulnick, Turns, & Wilderman (1990)	Facial photo	Identifying leaders			.90		
Gangestad et al. (1992) ^f	60 sec silent video of target talking about lunch date to opposite-sex (unseen) interviewer	Self-reports, social closeness (male/female)	.28/.08				

(Continued)

Table 1 (Continued)

Study	Information About Target Provided to Judges	Accuracy Criterion	Effect Sizes (<i>r</i>) for Five Traits				
			Agr	Con	Dom	Ext	Hon
Gifford (1994)	Silent video/3-person same sex groups	Self-reports, Social potency (male/female)			.45/.08		
		Wiggins IAS ^g agreeable	.23				
		Wiggins IAS, quarrelsome	.18				
		Wiggins IAS, extraverted				.45	
		Wiggins IAS, introverted				.41	
		Wiggins IAS, ingenuous					.21
		Wiggins IAS, calculating					.21
		Wiggins IAS, dominant			.26		
Kalma (1991)	Target/judge see each other in dyad or triad	Wiggins IAS, submissive			.18		
		Amount of talking			.27		
Levesque & Kenny (1993)	Target/judge in 4-person group; give demographic information	Self-ratings, Norman				.82	
Watson (1989)	Target/judge 30 minutes in large non-interacting group; then in 5-10 person, same-sex group saying "hi, my name is ..."	Self-ratings, Norman	.06	.15		.40	
Zebrowitz, Voinescu, & Collins (1996)	Facial photo	Q-sort, deceitful/straightforward					-.09

Note: Agr = agreeableness, Con = conscientiousness, Dom = dominance, Ext = extraversion, and Hon = honesty.

^aIn all studies reported, facial photos had neutral expressions. ^bMultidimensional Personality Questionnaire, Tellegen (1991). ^cScales from Norman's (1963) Big Five personality taxonomy. ^dScales from Costa & McCrae (1985) NEO Personality Inventory. ^ePartners were individuals who lived with the target person. ^fThis study also investigated accuracy in judging targets' sexual availability, *r*s = .50 (males) and .16 (females).

^gScales from Wiggins (1979) circumplex interpersonal trait taxonomy.

Using Brunswik's Lens Model to Assess Physical Qualities Informing Accurate Trait Impressions

Although there is considerable research bearing on the general question of whether people can accurately perceive others' personality traits from their physical qualities, these investigations rarely tell us what particular physical qualities are informing perception. Some investigators who have tackled this question have adopted Brunswik's lens model as their research paradigm (e.g., Borkenau & Liebler, 1992, 1993a, 1993b, 1995; Gangestad et al., 1992; Gifford, 1994). As shown in Figure 1, this model represents the ecologically valid cues to a trait (e.g., physical qualities that are correlated with it) as well as perceivers' utilization of both valid and invalid cues. Implementing the lens model involves three steps. One is to investigate the encoding of personality traits by measuring various physical qualities and determining which correlate with various personality traits that have been assessed by some objective index, such as behavior, personality test scores, or ratings by friends. This process serves to identify the "ecological validity" of various cues. A second step is to investigate the *decoding* of personality traits by correlating the measured physical qualities with person-

ality judgments. This process identifies perceivers' "cue utilization." Finally, by comparing the encoding and decoding correlations, researchers can determine which of the valid cues are utilized by perceivers, which valid cues are ignored, and which invalid cues are utilized and ignored. In addition, the overall accuracy of trait impressions can be calculated by correlating perceivers' judgments with the objective index of personality, and the variance in trait impressions accounted for by the valid cues can also be assessed. Although those who have applied this model in their research are to be commended for tackling the difficult questions that it attempts to answer, there are serious shortcomings in this work. In the following sections we will discuss representative findings from lens model research, after which the strengths and weaknesses of Brunswik's approach will be considered.

Physical Qualities Informing Accurate Trait Perceptions

Borkenau and Liebler (1992, 1993a) utilized Brunswik's lens model in an effort to identify the particular physical qualities within the visual and auditory modalities that communicate each of the Big Five person-

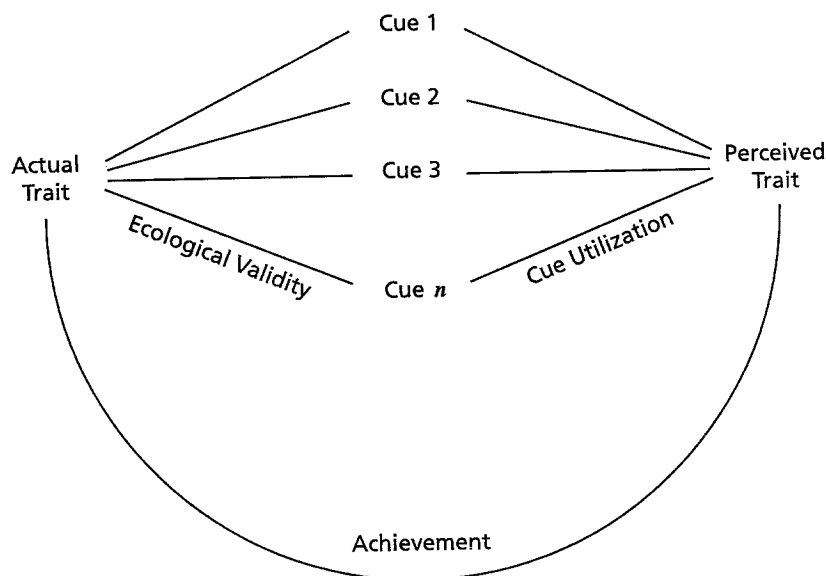


Figure 1. The lens model as employed in recent research on social perception accuracy.

ality traits. The investigators placed 45 physical qualities into four categories: (a) *overall impression variables*, including the target's estimated age, masculinity/femininity, unsympathetic/sympathetic, and unattractive/attractive; (b) *attributes that could be inferred from acoustic information*: soft voice, high voice, powerful voice, unpleasant voice, haltingly speaking, effortful reading, easy to understand, hectic speaking, standard language; (c) *attributes that could be inferred from static visual information*: unrefined appearance, made-up face, dark garments, showy dress, informal dress, unfashionable dress, long hair, stylish hair, light hair, stout physique, tall stature, less muscular physique, well-proportioned body, round face, thin lips, childlike face, hard facial lineaments, friendly expression, unconcerned expression, self-assured expression, extensive smiling, relaxed sitting, closed arms while sitting; avoiding the camera; and (d) *attributes that could be inferred from dynamic information*: fast movements, frequent hand movements, frequent head movements, touching oneself frequently, lifting feet while walking, lack of arm swinging, long strides, stiff walking.²

Overall or static appearance qualities that were appropriately utilized to judge high extraversion included attractiveness, makeup, fashionable, showy dress, stylish hair, and a friendly, self-assured, concerned, smiling expression. Dynamic cues included fast movements and frequent head movements. Vocal cues were a loud,

powerful voice. The average correlation with self- and other-ratings was moderate for all cues. Fewer of the measured appearance qualities communicated conscientiousness. People wearing dark garments, showy dress, and informal dress were rated as less conscientious by others and themselves, as were those who sat or walked in a relaxed way, and these cues all tended to yield small to moderate accuracy. Agreeableness was accurately communicated only by a childlike face. None of the measured physical qualities accurately communicated emotional stability or culture.³

Gifford (1994) utilized the lens model to identify physical qualities that communicate Wiggins's (1979) eight interpersonal traits. The physical qualities investigated were based on an extensive nonverbal scoring system in which the frequency, duration, or time sampling of 38 kinesic and facial behaviors are measured. Valid cues to ambitious/dominant were high scores on gestures and leg extension, whereas valid cues to the opposite pole of lazy/submissive were low scores on gestures and leg extension. Valid cues to gregarious/extraverted were high scores on head nods and gestures and low scores on arm wrap, whereas valid cues to aloof/introverted were low scores on head orientation and gestures and high scores on arm wrap and leg movement. The single valid cue to warm/agreeable was high head nods, and there were no valid cues to

²It is worth noting that use of the term *inferred* to describe many of the attributes in categories b–d shows a common overuse of this concept. The hegemony of constructivist thinking yields a failure to recognize that there are many things that we directly *perceive*. People don't infer that a voice is soft or high—they hear it. And people don't infer that someone has thin lips, closed arms, frequent head movements, or long strides—they see it.

³These results are taken from Borkenau and Liebler (1993a), and not all stand upon cross validation in another sample. In particular, Borkenau and Liebler (1993b, 1995) reported the same measures, with somewhat varying results. However, the variations are immaterial to the present aim of illustrating the atheoretical nature of findings generated by this application of Brunswik's lens model. For the data that are reported, different groups of judges rated the targets' physical qualities and the targets' traits, and target age and sex were partialled out of the correlations between physical qualities and traits.

cold/quarrelsome. The single valid cue to unassuming/ingenuous was low leg extension, whereas high gestures was the single valid cue to arrogant/calculating.

A study by Gangestad et al. (1992) also utilized Brunswik's lens model with the goal of identifying the particular visible qualities that communicate sexual availability and dominance as well as other traits.⁴ The 12 physical qualities that were investigated included physical attractiveness and 11 nonverbal behaviors (time smiling, time eye contact, time open posture, time head cant, time forward lean, time downward gaze, number of gestures, flirtatious glances, eyebrow flashes, downward looks, laughs). These authors did not report the ecological validity and utilization of each individual cue. Rather, they reported the multiple correlations of the measured cues with trait perceptions and with actual traits, as indexed by self-reports. Although this does not clarify what particular constellation of nonverbal behaviors communicate sexual availability or dominance, the authors did report that valid utilization of the measured cues substantially contributed to accurate trait perceptions.

Simply reading the lists of physical qualities that were assessed in the foregoing studies may give the reader an inkling of the problem with these applications of Brunswik's model. There is no guiding theory to organize the physical qualities and, consequently, the results reported are difficult to assimilate. Moreover, a substantial amount of the variance in trait perceptions was not accounted for by the measured cues:

Despite our attempt to measure most obvious aspects of targets' nonverbal presentations relevant to trait assessment, it appears that perceivers relied on cues we did not assess to a significant extent. Whether these additional cues involve configurations of our measured cues or distinct cues altogether is unknown. (Gangestad et al., 1992, p. 695)

A similar conclusion was reached by Gifford (1994). "Dispositions that were not well encoded may be encoded by behaviors that were not included in this study, may not be encoded in nonverbal behavior, or may not have been elicited often in the context of ... this study" (p. 407). The conclusions drawn by these researchers suggest that there will be greater success in identifying the physical qualities that inform accurate trait perceptions if researchers have a theoretical basis for selecting particular qualities to measure and if they measure configural qualities. As we discuss later, these conclusions are consistent with the Gibsonian ecological po-

sition, whereas Brunswik's lens model is silent on the question of what kinds of qualities to measure.

A Gibsonian Perspective on Brunswik's Lens Model

Like Gibson's (1979) ecological theory of perception, Brunswik's theory stresses the mutual relations between organisms and their natural environment and emphasizes that psychology should be as concerned with understanding the environment as it is with understanding the person. "Much as psychology must be concerned with the texture of the organism or of its nervous processes and must investigate them in depth, it also must be concerned with the texture of the environment" (as cited in Hammond, 1966, p. 16). Also like Gibson, Brunswik criticized the classical laboratory experiment as being overcontrolled such that stimulus determinants of perception covary in an artificial way. However, Brunswik's solution to this shortcoming was very different from Gibson's.

Brunswik advocated correlational research that samples stimuli across a natural ecological array. Thus, according to this position, the researcher who is interested in the accuracy of trait perception from physical qualities should sample physical qualities as they naturally co-occur in a representative sample of people. The correlations gleaned from this sampling would reveal the ecological validity of various cues. Research applying the Brunswik lens model to trait perception that was discussed earlier has adopted this approach, although the sample of people may not represent as truly an ecological sampling as Brunswik might have wished. The assumption that the puzzle of accurate trait perceptions can be solved by examining correlations gleaned from a sampling of physical qualities is consistent with Brunswik's claim that organisms are "probability learners" and that the perceptual system operates like an intuitive statistician. According to Brunswik's tenet of probabilistic functionalism, the cues available in the natural environment are of limited validity, and perceivers achieve some degree of accuracy by combining information from multiple cues as specified in the lens model. In keeping with this tenet, we have seen that Brunswik's lens model is typically used to derive a series of correlation coefficients between individual physical qualities (e.g., soft voice, round face) and particular traits (e.g., extraversion, conscientiousness). The implicit or explicit assumption is that perceivers achieve accurate trait perceptions by weighing each cue in proportion to its actual diagnosticity of the trait being judged.

Brunswik's view that the perceptual system operates like an intuitive statistician stands in contrast to Gibson's theory. According to Gibson, the information available in the natural environment is highly valid

⁴In the interest of brevity, the term *sexual availability* is used to refer to the willingness to engage in sexual relations without closeness or commitment as assessed by the Sociosexual Orientation Inventory (Simpson & Gangestad, 1991).

when one considers higher order structure as opposed to individual stimulus cues. As such, a Gibsonian approach focuses on configural cues whose structure can yield accurate perception without any probabilistic inferences. This position is consistent with that of another ecological theorist, Roger Barker, who asked why the ecological environment in psychology should be so different from that in other sciences:

The environment as described by chemists, physicists, botanists, and astronomers is not a chaotic jumble of independent odds and ends, and it has more than statistical regularity. It consists of bounded and internally patterned units that are frequently arranged in precisely ordered arrays and sequences. The problem of identifying and classifying the parts of the environment, i.e., the taxonomic problem, is very great, but the problem is not, primarily, to bring order of disorder. On the contrary its first task is to describe and explain the surprising structures and orders that appear in nature. (as cited in Hammond, 1966, pp. 321–322)

Summary

Research using Brunswik's lens model to identify the physical qualities that inform accurate trait perceptions appears to have limited utility. What we discover is a chaotic array of correlations. Moreover, these correlations may fail to capture many of the significant physical qualities that perceivers do utilize to accurately judge personality traits. According to Gibson's ecological theory, the answer to the accuracy puzzle requires attention to configurations of physical qualities that provide structured information. The task of identifying those configurations is undertaken in the next two sections of this article. First, we consider how physical and psychological qualities may come to be related, because this may suggest configurations of physical qualities that are likely to be ecologically valid indicators of traits. This analysis, coupled with tenets of the ecological theory of social perception, leads us to propose some specific configurations of physical qualities that may inform accurate social perception. It should be noted that once theoretically meaningful configurations are identified, researchers might then test their validity using Brunswik's lens model.

A Developmental Model of Relationships Between Physical and Psychological Qualities

Figure 2 illustrates four possible developmental routes to actual relationships between physical and psychological qualities, each of which is described in the following sections.⁵

⁵For related discussions, see Caspi, Bem, and Elder (1989), Lindzey (1967), and Scarr and McCartney (1983).

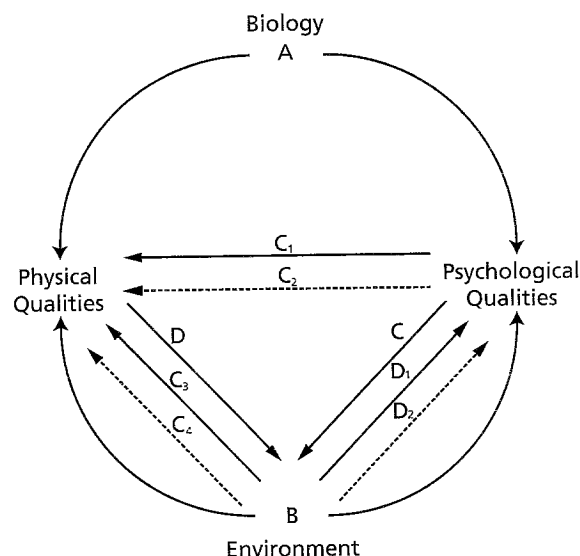


Figure 2. A developmental model of physical-psychological attribute relations. Path A represents an influence of the same biological factors on both physical and psychological qualities. Path B represents an influence of the same environmental factors on both physical and psychological qualities. Paths C₁ and C₃ represent a congruent influence of psychological qualities on physical ones (Dorian Gray effect) that may be direct or mediated through the environment, whereas paths C₂ and C₄ represent direct and mediated incongruent influences (artifice effect). Path D₁ represents an environmentally mediated congruent influence of physical qualities on psychological ones (self-fulfilling prophecy effect), whereas path D₂ represents an environmentally mediated incongruent influence (self-defeating prophecy effect).

Common Biological Cause

As shown in path A, both physical and psychological qualities may be influenced by the same genetic or biological factors. For example, the biological anomalies that produce the intellectual impairments associated with Down's syndrome, Cretinism, and Fetal Alcohol Syndrome also produce distinctive physical markers. And a syndrome called "minor physical anomalies," which includes widely spaced eyes, atypical head circumference and ears, and multiple hair whorls, also is associated with temperament (e.g., Bell & Waldrop, 1982; Paulhus & Martin, 1986). Similarly, the genes that produce blue versus brown eyes in humans may also cause differences in behavior, an effect that may be due to the fact that the hormone that influences eye color (alpha-melanocyte stimulating hormone) also affects arousal level and emotional reactivity (e.g., Rosenberg & Kagan, 1987). Indeed, an analogous relationship between coloration and temperament in animals has been explained by biological factors. The gene responsible for albinism in mice also causes difficulty in learning to escape from a noxious stimulus (Winston & Lindzey, 1964). Another example of an influence of biological factors on physical and psychological qualities is the recently discovered Bloom's syndrome (Saltus, 1995). This syndrome is caused by a rare mutant gene that produces not only a susceptibility to cancer but also

distinctive physical qualities (large, sun-sensitive red markings on the face; a small, narrow head; and short stature) as well as distinctive personality traits (a charming, pleasant personality; inordinate optimism; and a failure to mature from childlike judgment and gullibility).

Biological influences on physical and psychological qualities can be seen not only for static physical qualities but also for more dynamic ones. Thus, the greater frequency and speed of physical movements shown by those who have an extraverted personality may reflect a common biological cause, because it has been argued that both the dynamic movements and the personality trait are caused by low arousal levels (Eysenck, 1967). Biological factors may also cause dynamic movements to be correlated with psychological qualities more transient than a personality trait. Developmental, neuropsychological, and cross-cultural evidence all support a biological basis for the correlation between particular facial expressions and particular emotional states (e.g., Balaban, 1995; Bruyer, 1986; Ekman, Friesen, & Ellsworth, 1982b). There may also be a biological basis for the association of other nonverbal behaviors and transient psychological qualities. For example, a "plus" facial pose, with chin thrust forward, may universally signal assertion, whereas a "minus" facial pose, with chin lowered, may universally signal submission (e.g., Zivin, 1977a, 1977b).

Common Environmental Cause

A second possible link between physical and psychological qualities is that both may be influenced by the same environmental factors, as shown in path B. The person who has a thin, bony face due to poor nutrition may have certain personality traits that also derive from food deprivation. A person's physical and psychological qualities also may both be influenced by the people with whom they routinely interact. For example, people who live in ghetto neighborhoods may groom themselves in distinctive ways and develop particular personality traits that differ from the grooming and personality traits shown by those who live in suburbia. Another example of the influence of social interactions on physical and psychological qualities is provided by the suggestion that kin resemblance may not be simply a matter of common genes but also a matter of prolonged social contact. In particular, a tendency for husbands and wives to become more similar in facial appearance over time may reflect repeated empathic mimicry of each other's facial expressions. Increased similarity in character traits may also reflect common social factors (Zajonc, Adelman, Murphy, & Niedenthal, 1987).

Psychological Causes Physical

A third possible link between physical and psychological qualities is that the latter influence the former,

as shown in paths C_1 through C_4 in Figure 2. For example, although we tend to think of facial structure as fixed, people with a tense, irritable temperament may tense certain facial muscles in a way that yields different jaw development from that shown in people who are more easygoing (Kreiborg, Jensen, Moller, & Bjork, 1978; Moller, 1966). Similarly, over the years a person's temperament may become etched in the pattern of wrinkles on the face. Following Orwell's adage that "at 50, everyone has the face he deserves" (*Oxford Dictionary of Quotations*, 1989), elderly people whose faces resemble a particular emotional expression even when they are posing a neutral expression actually have a related personality disposition (Malatesta, Fiore, & Messina, 1987).

The tendency for personality to produce congruent physical qualities is represented by paths C_1 and C_3 . This is called the Dorian Gray effect after the novel by Oscar Wilde, in which the portrait of the protagonist changed over time, registering an increasingly menacing visage with his increasingly dastardly deeds. As shown in Figure 2, the Dorian Gray effect may be a direct effect of psychological qualities on physical ones (path C_1), or it may be mediated through the environment (path C_3). Examples of the latter, indirect effect could be tendencies for individuals with a hostile temperament to choose activities that have a deleterious effect on their appearance, such as boxing or alcohol abuse, or for those who are highly sociable to choose grooming aids that have a beneficial effect on their appearance.

Another possible effect of psychological qualities on physical ones, shown by the broken paths C_2 and C_4 , is an artifice effect whereby psychological qualities produce incongruent physical qualities. Such an effect can be direct, as when a dishonest person smiles and looks people in the eye while lying (path C_2), or it can be mediated by the environment, as when a criminal uses grooming aids, clothing, or even cosmetic surgery to portray the image of an upstanding individual—the wolf in sheep's clothing (path C_4). Evidence that people can indeed manipulate their facial appearance to convey certain psychological qualities is provided by the finding that individuals are perceived as more powerful when they are attempting to look dominant than when they are attempting to look submissive, an effect that held true even though they had an emotionally neutral facial expression in both cases (Berry & Finch-Wero, 1993). It should be noted that such projection of psychological qualities requires the existence of strong physical-psychological associations that can be exploited. To the extent that such artifice effects occur, the information provided by physical qualities will yield inaccurate social perceptions.

Physical Causes Psychological

A final causal path is one in which different physical qualities cause people to experience different environ-

ments, as shown in path D, and these divergent environments ultimately cause differences in the psychological qualities of those who look one way versus another. There are two ways in which physical qualities may exert a causal influence on the environment. First, they may lead a person to actively select a particular type of environment. For example, an extremely unattractive person may actively select certain social environments, such as small gatherings rather than large mixers. Second, the extremely unattractive person may evoke a certain kind of social environment—she may be viewed and treated by others as if she were introverted and socially awkward. Such environmental effects of physical appearance may produce one of two effects on behavior. They may produce a self-fulfilling prophecy effect in which the unattractive person becomes more introverted than someone who attends large mixers or who is treated by others as if she were socially skilled. This effect is illustrated by the solid path D_1 in Figure 2. Alternatively, these experiences may produce a self-defeating prophecy effect in which the unattractive person compensates for the deprivation of certain social opportunities or for others' negative expectations by becoming even more extraverted than someone who does not experience these environmental consequences of an unattractive physical appearance. This possibility is illustrated by the broken path D_2 in Figure 2. Like artifice effects, self-defeating prophecy effects will yield inaccurate perceptions of traits from physical qualities.

Summary

We have seen that there are several plausible routes to relationships between physical and psychological qualities that could account for the evidence of accurate impressions at zero acquaintance. Although predictions that can be derived from paths A, B, and C should be interesting and fruitful for suggesting physical qualities that can inform accurate perceptions, in the next section we will consider predictions to be derived from path D, because these are most central to the usual concerns of social psychology.

Informative Physical Configurations Derived From Overgeneralization Effects

To the extent that path D in the developmental model of physical-psychological attribute relations is operating, perceivers' trait perceptions may be accurate because their own expectancies make them so. In order for this explanation to be noncircular, the expectancies cannot be attributed to the detection of expectancy-induced correlations. Instead, we propose five

overgeneralization effects that can yield expectancies that contribute to the self-fulfilling development of actual relations between physical and psychological qualities. These overgeneralization effects may also contribute to self-defeating prophecies, to artifice effects, which exploit expectancies, or they may simply produce stereotypes—path D in the model without the continuing paths D_1 or D_2 (see Zebrowitz, 1996, for an application of overgeneralization effects to group stereotypes).

The proposed overgeneralization effects all derive from the adaptive value of responding to the information that physical qualities do provide. According to the ecological theory of social perception, we are attuned to adaptively relevant information. Although the accuracy of social perception is thus emphasized, error may occur due to the lack of available information or due to the overgeneralization of perceptions that typically are adaptive and accurate (Zebrowitz, 1990). More specifically, the evolutionary importance of detecting attributes such as age, emotion, health, species, and identity may have produced such a strong preparedness to respond to the physical qualities that reveal them that our responses are overgeneralized to individuals whose physical qualities merely resemble these attributes.⁶ Although overgeneralization effects may not seem particularly adaptive, the errors that result from overresponding to physical qualities that suggest a particular age or emotion or species may be less maladaptive than errors that would result from failure to respond to these qualities.

In keeping with the ecological theory tenet that perceptions are typically grounded in configural, dynamic, and multimodal information (Gibson, 1979; McArthur & Baron, 1983), each overgeneralization effect specifies particular configurations of multimodal and dynamic physical qualities that will give rise to particular behavioral expectations. On the assumption that these expectations can produce self-fulfilling prophecy effects, predictions will be made regarding the physical qualities that may accurately communicate extraversion and dominance, two traits whose perception has proven accurate. Where pertinent data are available, the influence of the relevant physical qualities on these two trait impressions and the actual diagnosticity of these physical qualities also will be discussed. Although our application of the overgeneralization effects typically will be confined to the qualities of extraversion and dominance, arguments can also be made for their relevance to the perception of other psychological qualities at zero acquaintance.

⁶ Although the evolutionary origin of such preparedness cannot be proven, considerable evidence does reveal a neural basis for the perception of these attributes (see Zebrowitz, 1997, for a review).

The Age Overgeneralization Effect

Correlations between age and physical qualities.

People whose physical qualities resemble those of a particular age group may be expected to have psychological qualities typical of that age, an overgeneralization effect that reflects the adaptive value of responding to age-related physical qualities, such as nurturing the very young and the very old and mating with the fertile. The configuration of physical qualities that can contribute to social expectations by virtue of the age overgeneralization effect include body size and proportion, movement qualities, vocal qualities, and facial qualities, each of which differentiate particular age groups, including babies, children, mature adults, and the elderly (Alley, 1983; Enlow, 1982; Helfrich, 1979; see Zebrowitz, 1997, for a review of pertinent evidence).

Influence of age-related physical qualities on social perception. The influence of the foregoing age-related physical differences on social perception has been most well documented for physical qualities that resemble a baby's. People with a configuration of babyish facial features, including large eyes; full lips; small noses; high, thin eyebrows; a small chin; and a round face are perceived as warmer and less dominant than those with more mature features (e.g., Berry & McArthur, 1985, 1986; Keating, 1985; McArthur & Apatow, 1983–1984). Babyfaced individuals of all ages and races create these impressions in perceivers of all races and in children as young as 3 years of age (Montepare & Zebrowitz-McArthur, 1989; Zebrowitz & Montepare, 1992; Zebrowitz, Montepare, & H. K. Lee, 1993). Even young infants respond positively to babyfaced adults, an effect that suggests the possibility of an innate basis for the babyface overgeneralization effect (Kramer, Zebrowitz, San Giovanni, & Sherak, 1995).

The tendency for responses to babies to be overgeneralized to others who resemble them holds true for vocal resemblance as well as for facial resemblance. Adults with more childlike voices are perceived as warmer and less dominant than those with more mature voices (Berry, 1990b; Montepare & Zebrowitz-McArthur, 1987). Stereotypes of overweight individuals as warmhearted, agreeable, and dependent (Kiker & Miller, 1967; Sleet, 1969; Wells & Siegal, 1961) further suggest an overgeneralization of reactions to the chubby bodies of babies. Also, evidence that short people achieve lower social status (Chaiken, 1986; Collins & Zebrowitz, 1995; Roberts & Herman, 1986) suggests an overgeneralization of reactions to the shorter stature of babies and children. Finally, young people whose gaits resemble the elderly are perceived as less dominant than those with a more youthful gait (Montepare & Zebrowitz-McArthur, 1988).

Although research has established age-overgeneralization effects for facial, vocal, and movement qualities considered separately, perceptions of dominance and sociability should be strongest when these physical qualities are acting in concert. However, these qualities are unlikely to all be babyish unless the target of perception is actually a baby. Similarly, they are unlikely to all be elderly unless the target is actually elderly. For this reason, the availability of multimodal information may typically reduce age-overgeneralization effects. Indeed, the perception of greater warmth in men with more childlike voices was eliminated when their faces were also seen. On the other hand, seeing men's faces did not eliminate the effects of a childlike voice on impressions of their weakness, and hearing men's voices did not eliminate the effects of a babyface on impressions of their warmth and weakness, although it did diminish the latter (Zebrowitz-McArthur & Montepare, 1989). It thus appears that the ability of multimodal information to reduce age-overgeneralization effects may depend on the modality that is added and the psychological attribute being judged.

Accuracy of social perception based on age-related physical qualities. If the expectancies created by the age-overgeneralization effect produce self-fulfilling prophecy effects, they could conceivably contribute to accuracy in judging dominance and extraversion at zero acquaintance. More specifically, people whose physical qualities resemble those of babies and children should be more extraverted and less dominant than those with more mature physical qualities. Similarly, people whose physical qualities resemble those of the elderly may develop different traits from those with more youthful but mature qualities. It is more difficult to specify exactly what traits they should develop, because research has revealed very mixed stereotypes of the elderly (e.g., Hummert, Garstka, Shaner, & Strahm, 1994; Kite & Johnson, 1988). However, the fact that an elderly gait elicits the expectation of submissiveness suggests that self-fulfilling prophecy effects may lead to a true correlation between aged physical qualities and submissiveness.

Although little research has examined whether age-related physical qualities predict dominance and extraversion, there is some pertinent evidence. Babyfaced adults score lower than the maturefaced on personality tests of aggression, suggesting that they may be less dominant (Berry, 1990a). Babyfaced college men also reported higher self-disclosure and greater intimacy in their social interactions, which could reflect greater extraversion (Berry & Landry, 1997). Other research suggests that the correlation between babyfacedness and personality may depend on the stability of appearance over time. In particular, Zebrowitz, Collins, and Dutta (1996) utilized an archival data set to investigate the

relationship between appearance and personality across the life span. Q-sort measures assessing the extent to which participants' personalities matched the babyface stereotype revealed that women who were highly babyfaced from adolescence to their late 50s showed more babyfaced personalities in their 50s but not in adolescence or their 30s. Interestingly, women whose appearance was unstable across the same time span showed no significant correlations between babyfacedness and personality. This evidence is consistent with the suggestion that accurate relationships between babyfacedness and personality are due to self-fulfilling prophecy effects, which would be facilitated by stable appearance qualities.

Whereas the foregoing evidence of correlations between personality and age-related physical qualities suggests that the age-overgeneralization effect could contribute to accurate perceptions of personality in adults judged at zero acquaintance, there is evidence to indicate that the age-overgeneralization effect yields inaccurate perceptions of personality in adolescent boys. More babyfaced adolescent boys are seen as more submissive (Zebrowitz, 1995). However, the very same boys had *less* stereotypical babyfaced personalities than their more maturefaced peers, showing higher dominance (Zebrowitz, Collins, & Dutta, 1996). These effects were due to personality differences between those in the top quartile in babyfacedness as compared with those who were moderate or low in babyfacedness. Moreover, these correlations between babyfacedness and personality depended on the stability of appearance over time, which suggests that they may reflect self-defeating prophecy effects. Highly babyfaced adolescent boys who had been stable in appearance since childhood were more assertive and less warm at adolescence but not at earlier ages, and boys who were unstable in appearance from childhood to adolescence showed no significant correlations between appearance and personality at any age (Zebrowitz, Collins, & Dutta, 1996).

Evidence for the accuracy of social perception based on age-related physical qualities is consistent with the developmental model, but the data reveal that the relationship between expectancies and accuracy can be complex. Accurate social perception based on age-related physical qualities may be more likely when accuracy is assessed by examining behavior in social interactions where expectancies can directly influence the behavior (e.g., Berry & Landry, 1997) than when it is assessed by examining more global personality traits that require an internalization of others' expectancies (e.g., Zebrowitz, Voinescu, & Collins, 1996). Also, although expectancies sometimes appear to play out in self-fulfilling prophecy effects that yield accurate perceptions, the developmental processes instigated by these expectancies sometimes yield inaccurate perceptions. A determining factor seems to be the social desirability of the expected psychological quali-

ties—for example, babyfaced traits are more culturally desirable for adult women than for adolescent boys.

The Emotion Overgeneralization Effect

Correlations between emotion and physical qualities. People may be perceived to have those psychological qualities that are associated with the emotional expressions that their features resemble, an overgeneralization that reflects the adaptive value of responding to emotional expressions, such as avoiding an angry person and approaching a happy one. This principle is related to the process of temporal extension (Secord, 1958), whereby a genuine emotional expression is perceived to extend in time, yielding the impression of related traits. For example, people with angry expressions are perceived to be high in dominance, people with fearful or sad expressions are perceived to be low in dominance, and people with happy expressions are perceived to be high in affiliation (Knutson, 1996). The difference between this temporal extension effect and the emotion-overgeneralization effect is that in the latter case it is stable physical qualities resembling an emotional expression that yield the impression of related traits. The configuration of physical qualities that can contribute to social perception by virtue of the emotion-overgeneralization effect includes movement qualities, vocal qualities, and facial qualities, each of which differentiates various emotions (e.g., Bassili, 1979; Ekman, Friesen, & Ellsworth, 1982a; Mehrabian, 1972; Montepare, Goldstein, & Clausen, 1987; K. R. Scherer, 1986; see Zebrowitz, 1990, chap. 4, for a review of pertinent research).

Influence of emotion-related physical qualities on social perception. Because anger is positively related to dominance and negatively related to sociability, physical qualities that resemble the expression of anger should influence impressions of these psychological qualities. Similarly, physical qualities that resemble the expression of happiness should influence impressions of the related trait of sociability. Research supports this prediction. Schematic faces with low or thick eyebrows are perceived not only as angrier than the same faces with thin or normal eyebrows but also as more dominant and less warm and friendly (Ekman et al., 1982a; Keating, 1985; Keating et al., 1981; Laser & Mathie, 1982). Similarly, more friendliness is perceived in people who have more upturned corners on the mouth or more wrinkles at the corner of the eye, which is a marker of a genuine smile (Ekman et al., 1982a; Laser & Mathie, 1982; Secord, Dukes, & Bevan, 1954).

The tendency for facial qualities that resemble an angry expression to convey high dominance and low

sociability and for those that resemble a happy expression to convey high sociability may extend to the vocal and gestural qualities that resemble these emotional expressions. The finding that those with louder voices are perceived both as more dominant and more extraverted supports this prediction, because louder voices are associated both with anger and with happiness (Robinson & McArthur, 1982; Rose & Tryon, 1979; K. R. Scherer & U. Scherer, 1981). Accomplishing the difficult task of identifying the unique configuration of vocal cues that signals anger versus happiness (cf. Frick, 1985; K. R. Scherer, 1986) should enable researchers to predict which will differentially influence perceptions of dominance and extraversion. The finding that a heavy-footed gait communicates anger whereas a quick pace communicates happiness (Montepare, Goldstein, & Clausen, 1987) suggests that these gait qualities may be overgeneralized to influence impressions of dominance and extraversion, respectively. Finally, impressions of dominance and sociability should be strongest when emotion-related facial, vocal, and gestural qualities all resemble a particular emotion. If such congruence is absent, then the emotion-overgeneralization effect should be diminished when multimodal information is provided.

Accuracy of social perception based on emotion-related physical qualities. Like expectancies produced by the age-overgeneralization effect, those created by the emotion-overgeneralization effect could conceivably contribute to accuracy in judging extraversion and dominance at zero acquaintance. If these expectancies produce self-fulfilling prophecy effects, then people whose physical qualities resemble those of an angry emotional expression should be less sociable and more dominant than those whose physical qualities resemble those of a happy emotional expression. There is little data bearing on this hypothesis. However, some consistent evidence is provided by the previously mentioned finding that elderly people whose neutral face resembles anger tend to have a more hostile disposition (Malatesta et al., 1987). Whether this reflects a self-fulfilling prophecy effect or a Dorian Gray effect requires additional, longitudinal research examining the relationship between emotion-related physical qualities and the accuracy of trait impressions over time.

Sickness Similarities

Correlations between fitness and physical qualities. People whose physical qualities resemble those observed in a particular physical or mental disorder may be perceived to have psychological qualities

that are associated with that disorder. This overgeneralization effect reflects the adaptive value of responding to physical indicators of fitness, such as avoiding those with communicable diseases and mating with those who are genetically fit. The configuration of physical qualities that can contribute to social perceptions by virtue of sickness similarities include facial qualities, vocal qualities, bodily qualities and movement qualities, each of which may identify various maladies (see Zebrowitz, 1997, chap. 2, for a review of this evidence).

Influence of fitness-related physical qualities on social perception. Little research has directly investigated the influence of fitness-related physical qualities on trait perception. However, it can be argued that the attractiveness halo effect, whereby more attractive people are perceived as more sociable, dominant, intellectually competent, and well adjusted (e.g., Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992), could reflect an influence on impressions of fitness-related qualities. This is because qualities that increase attractiveness, such as average facial proportions and symmetry (e.g., Grammer & Thornhill, 1994; Langlois & Roggman, 1990; Rhodes, Proffitt, Grady, & Sumich, 1996; Zebrowitz, Voinescu, & Collins, 1996), also can be markers of psychological fitness inasmuch as various psychological disorders are accompanied by facial anomalies. For example, hyperactivity and retardation are associated with Fetal Alcohol Syndrome, which is marked by several facial malformations, including a small head circumference, a flattened midface, a sunken nasal bridge, and narrow eyes. Hyperactivity and intellectual deficits are also associated with a syndrome of Minor Physical Anomalies, which include atypical head circumference; multiple hair whorls; and ears that are asymmetrical, malformed, and low seated. This set of facial anomalies may also mark schizophrenics (Bell & Waldrop, 1982; Campbell, Geller, Small, Petti, & Ferris, 1978; Cummings, Flynn, & Preus, 1982; Krouse & Kauffman, 1982; Paulhus & Martin, 1986; Streissguth, Herman, & Smith, 1978). Thus, the attribution of greater sociability and dominance to more attractive people may reflect an overgeneralization of the accurate perception of lower social competence in emotionally disturbed people with various facial anomalies.⁷

It is possible that the qualities that increase vocal or bodily attractiveness also can be markers of psychological fitness. If so, then the halo effect for attractive voices and bodies (e.g., Berry, 1990b; Roberts & Herman, 1986; Singh, 1993, 1995; Zuckerman, Hodgins, & Miyake, 1990) may also reflect an overgeneralization of

⁷Similarly, the attribution of higher intellectual competence to more attractive people may reflect an overgeneralization of the accurate perception of lower competence in mentally retarded people with various facial anomalies.

the accurate perception of lower social competence in certain individuals who are unattractive on these dimensions. Given the ecological theory tenet that perceivers respond to multimodal information, the sickness similarities overgeneralization effect should be most pronounced when faces, bodies, and voices are congruent in attractiveness.

Accuracy of social perception based on fitness-related physical qualities. If the attractiveness halo effect reflects an influence of fitness-related physical qualities on trait impressions, then evidence for the accuracy of the halo is pertinent to evaluating the accuracy of social perception based on sickness similarities. Although there is little evidence to support the stereotype of attractive people as more dominant and intelligent than their less attractive peers, there is evidence to indicate that attractive people are more sociable.

Not only are attractive people more popular but they are also more socially skilled in interpersonal interactions (Feingold, 1992). However, the accuracy of the impression that attractive people are sociable is more elusive when sociability is assessed as a global personality trait rather than by behavior in interpersonal interactions where others' expectancies can directly influence behavior. In the former case, the greater sociability of attractive people appears limited to those whose appearance has been stable over time, suggesting a self-fulfilling prophecy effect in which cumulative effects of others' expectancies are required to produce the internalization that is reflected in a global personality trait (Feingold, 1992; Zebrowitz, Collins, & Dutta, 1996). There is also evidence that the greater sociability of attractive women may result from a Dorian Gray effect: Women who were highly sociable in late adolescence and in their 30s became more attractive in their 50s than those who had been less sociable, an effect that was mediated by greater use of makeup (Zebrowitz, Collins, & Dutta, 1996).

Given evolutionary theorists' claim that attractiveness advertises physical fitness (e.g., Singh, 1993; Thornhill & Gangestad, 1993), it is important to note that the greater social fitness of attractive people does not appear to reflect biological causes (path A of the developmental model), as evidenced by data more consistent with self-fulfilling prophecy or Dorian Gray effects. Thus, although biological factors may cause both facial anomalies and social incompetence in clinical populations, this cannot explain the pattern of correlations in normal populations where the accuracy of the attractiveness stereotype has been examined. Those correlations are more consistent with the social consequences of a sickness similarities overgeneralization effect.

Animal Analogies

Correlations between animals and physical qualities. People may be perceived to have psychological qualities that are associated with the animals whom their features resemble, an animal-overgeneralization effect. Although this principle may seem a bit far-fetched, it is likely to be rooted in our evolutionary history, because differences in physical qualities among species provide information that facilitates adaptive actions such as running from dangerous lions but not from harmless rabbits. The configuration of physical qualities that can contribute to social perceptions by virtue of animal analogies include movement qualities, vocal qualities, and facial qualities, each of which differentiate various species. It would be a prodigious task to summarize all of the correlations between animal species and physical qualities. However, it seems likely that the physical qualities most apt to contribute to social perceptions via an animal-overgeneralization effect are those possessed by animals who are strongly associated with a particular trait, such as the dominant lion, the sly fox, and the submissive sheep.

Influence of animal-related physical qualities on social perceptions. Although there is little research examining the influence of animal-related physical qualities on social perception, evidence of associations between particular animal features and particular traits abounds. In the 17th century, Della Porta expressed the logic of animal analogies in the following syllogism: "All parrots are talkers, all men with such noses are like parrots, therefore all such men are talkers" (as cited in Wechsler, 1982, p. 179). Lavater, the prominent physiognomist whose work was widely read in the 18th and 19th centuries, also endorsed this view, stating that

were the lion and lamb, for the first time, placed before us, had we never known such animals, never heard their names, still we could not resist the impression of the courage and strength of the one, or of the weakness and sufferance of the other. (1879, p. 212)

The penchant to draw analogies between the characteristics of animals and humans remains in our current thinking as evidenced by trait adjectives such as *sheepish*, *pigheaded*, *bully*, *birdbrained*, *lionhearted*, *catty*, *bitchy*, *foxy*, and metaphors such as *jackass*, *dove*, *hawk*, *bear*, *cow*, *pig*, *wolf*.

Although we usually apply epithets such as *fox* or *leonine* to people whose behavior resembles that of those animals, we may also see *foxy* or *leonine* behavior in people whose physical qualities resemble those animals. Foxes and foxfaced men are judged as shrewd, whereas lions and lionfaced men are seen as dominant

and proud (Szymanski & Zebrowitz, 1987). Other leonine qualities that could create impressions of dominance via animal analogies include a lumbering gait and a deep, loud voice. Sheeplike qualities that could create impressions of submissiveness via animal analogies include a small, narrow face; fluffy hair; a gait with a short stride; and a high, quavering voice.

Mistaken Identity

Correlations between individuals and physical qualities. Strangers may be perceived to have the same psychological qualities as the significant others or archetypes whom they resemble. This overgeneralization effect is rooted in the adaptive value of the physical markers of identity for avoiding potentially dangerous strangers and approaching safe, familiar people. Facial, vocal, and gestural qualities each provide identity information. Like snowflakes, no two faces are alike. Voices are also sufficiently unique that computer technology permits them to be used to identify individuals who may access restricted places. And friends can recognize each other by their gaits (Kozlowski & Cutting, 1977).

Influence of mistaken identity of social perception. Research has shown that a mistaken identity effect can occur on an individual basis, with people seeing the psychological attributes of their own mothers or lovers or acquaintances in those who physically resemble them (e.g., Andersen & Cole, 1990; Andersen, Glassman, Chen, & Cole, 1995; Fiske, 1982; Lewicki, 1985; Secord & Jourard, 1956). However, for mistaken identity to contribute to accurate social perceptions via self-fulfilling prophecies, the effect cannot vary from perceiver to perceiver. Rather, it must show considerable constancy within a given social group, reflecting a tendency to expect certain traits or affordances in people who resemble some archetype, like Marilyn Monroe or Adolf Hitler. One study pertinent to such an effect found that students formed more negative impressions of an unknown politician when his physical appearance matched the politician image shared by those students than when it did not (Fiske, 1982, p. 66). Similarly, people who resemble a forceful world leader, like Winston Churchill, may be perceived as highly dominant; those who resemble a sociable talk show host, like Oprah Winfrey, may be perceived as highly extraverted; and those who resemble a genius, like Albert Einstein, may be perceived as highly intelligent.

Summary

The analysis of possible developmental routes to a correspondence between physical and psychological

qualities uncovered various lines of research that must be pursued in order to make needed theoretical predictions regarding the physical qualities that can inform accurate social perception at zero acquaintance. One of these is to identify the perceiver expectancies that can produce self-fulfilling prophecy effects. Tenets of the ecological theory of social perception have been employed to derive five overgeneralization effects representing such expectancies: age-overgeneralization effect, emotion-overgeneralization effect, sickness similarities, animal analogies, and mistaken identity. Each overgeneralization effect specifies particular configurations of physical qualities that will give rise to particular behavioral expectations and, via self-fulfilling prophecy effects, may create true relationships between physical and psychological qualities.

The Advantages of Studying Affordances

A Gibsonian approach not only provides guidance regarding what physical qualities will communicate what psychological ones, but it also highlights the contribution of the social context to accurate social perceptions. This contribution is inherent in the Gibsonian concept of "affordance." Consistent with the tenet that "perceiving is for doing," social affordances are the opportunities for acting, interacting, or being acted upon that others provide. Because affordances are inherently connected to a particular social context, studying the accuracy of perceived affordances will compel researchers to consider the neglected topic of contextual influences on accuracy. Moreover, Gibson's ecological theory argues for even greater accuracy in the perception of social affordances than dispositional traits (Gibson, 1979; McArthur & Baron, 1983). This is because the correct identification of affordances has stronger implications for adaptive behavior, particularly at zero acquaintance, when a target person's stable behavior patterns are of less interest. It should be noted that determining people's level of accuracy in perceiving the affordances that others provide has at least as much theoretical and practical importance as determining accuracy in perceiving others' traits. In the domain of stranger perception, it is important to know whether we can accurately perceive who will help us and who will not and, if so, how we achieve this. Similarly, it is important to know whether we can accurately perceive who will harm us, who will provide us with needed information, whom we can trust, whom we can influence, and so on.

There are two contextual influences on the accurate communication of affordances at zero acquaintance. One is the effect of the social setting on the availability of diagnostic physical qualities—whether those qualities are displayed. Another is the attunement of the perceiver to the diagnostic qualities that are avail-

able—whether the perceiver will attend to those qualities—which depends on the perceiver's social goals, behavioral capabilities, and perceptual experience (McArthur & Baron, 1983). It should be noted that both of these contextual factors may also influence the accurate communication of traits. Indeed, as noted earlier, a researcher using Brunswik's lens model to investigate accurate trait perception lamented that "dispositions that were not well encoded...may not have been elicited often in the context of...this study" (Gifford, 1994, p. 407).

Perceiver attunement. The centrality of perceiver attunement to the accurate perception of affordances is shown by the fact that an affordance is an emergent property, reflecting the task-relevant properties that the target person has for the perceiver. The interactive nature of affordances makes their accurate perception an instance of what Swann (1984) called circumscribed accuracy. Although Funder (1995) rejected this "pragmatic" accuracy criterion on the grounds that "accuracy is not viewed as dependent on any properties that the target of judgment actually has. Nearly all of the focus is on the judge, not the judged" (p. 656), this view reflects a misunderstanding of the affordance concept. Affordances are not merely in the eye of the perceiver; the target has them, though they may not be the same for all perceivers. A particular stranger may afford sexual availability for perceivers of a particular age and sex but not for perceivers of a different age and sex. Similarly, a stranger may afford the threat of domineering some perceivers but not others.

Evidence that people are attuned to the particular affordances that strangers have for them is provided by the finding that dependent perceivers notice how affiliative others are, which is pertinent to their goal of eliciting approval and support in social interactions, whereas dominant perceivers notice how assertive the same people are, information that is more pertinent to their interpersonal goals (Battistich & Aronoff, 1985). The perception of such emergent properties is important to understand, given that "a substantial proportion of the variance in subjects' impressions of each other is accounted for by the unique impression that subjects form of particular other persons" (DePaulo, Kenny, Hoover, Webb, & Oliver, 1987, p. 309). Although research has not found perceivers' unique impressions of how a person will behave with them to be more accurate than impressions of how a person will generally behave (Levesque & Kenny, 1993), that work examined impressions of a person's likely nonverbal behaviors (e.g., voice animation, smiling, gesturing). This is very different from impressions of the adaptively relevant behavioral opportunities that a person affords the perceiver, and research assessing the accu-

racy of the latter impressions is needed. Moreover, it should be noted that the accurate detection of affordances does not necessarily require that the detected qualities be unique to the relationship between perceiver and partner. If I correctly detect that someone will help me, then I have accurately perceived that person's affordance for me even if she also is generally helpful to others.

As noted previously, perceiver attunements can influence the perception of traits as well as affordances, and attunements may have influenced the relative accuracy of perceiving different traits in previous research. The individualistic and "prozac" cultural values in the United States may cause American perceivers to be highly attuned to dominance and extraversion, thus accounting in part for greater accuracy in perceiving these than other traits. On the other hand, Asians appear to be highly attuned to conscientiousness, which is more adaptively relevant in a collectivist culture where people are highly interdependent (M. H. Bond & Forgas, 1984) and, for the same reason, they may also be attuned to agreeableness. Thus, unlike Americans, Asians may show high accuracy in perceiving agreeableness and conscientiousness.

Information availability. Affordances should be more accurately perceived than traits not only because perceivers are apt to be more highly attuned to them but also because affordances are more likely than traits to be specified by physical qualities available in a delimited social context. For example, less information is needed to accurately perceive whether a person affords sexual availability or helpfulness to me than to perceive whether a person is generally sexually available or helpful. Although the importance of considering the quantity and quality of the available information as well as the perceiver's sensitivity to that information has been noted (e.g., Funder, 1995), research has rarely considered the differential availability of information across social contexts. Rather, the availability of information has been examined across perceivers, with friends and acquaintances predicted to have more than strangers, and it has also been examined across traits, with more "visible" traits providing more information than less visible ones (e.g., Funder & Colvin, 1988; Funder & Dobroth, 1987). The concept of affordance highlights the need to examine interaction effects, whereby information about particular traits or affordances is more available in certain social contexts, defined by the particular situation and the particular perceiver. Appropriately selected contexts will provide what Baron and Misovich (1993) called "social litmus tests" for particular traits or affordances and should yield high accuracy in perceiving those attributes. An examination of the social contexts utilized in previous accuracy research reveals how the provision of such a

litmus test may influence the traits that are most accurately perceived.

One study investigating the accuracy of trait perceptions concluded that sexual availability is more accurately perceived than other traits (Gangestad et al., 1992). This conclusion was based on impressions of college students who were viewed in a silent videotape discussing a possible lunch date with a member of the opposite sex. This is a social context likely to provide physical qualities that convey sexual availability. However, if the confederate with whom targets chatted were 90 years old or someone of the same sex, then variations in their sexual availability may not have been displayed. Similarly, if targets had been debating some controversial issue rather than discussing a lunch date, physical qualities that reveal dominance may have been more salient than those that reveal sexual availability, with the result that social dominance would have been most accurately perceived.

Similar arguments apply to the finding that extraversion is judged more accurately than the other Big Five traits. Although this effect holds true even in a neutral social context—for example, when perceivers judge targets who were videotaped while moving around alone in a room (Borkenau & Liebler, 1992; 1993a)—an ecological approach predicts variation as a function of the social context. Perceptions of extraversion should be even more accurate when targets are in a social context that elicits more perceptible information about this trait—for example, in a room full of strangers—just as variations in children's withdrawal are more pronounced in situations that tax their competencies (Wright & Mischel, 1987). Consistent with this reasoning, extraversion may be more visible than dominance in entertainment settings, whereas the reverse is true in athletic settings, and some settings may make one pole of a trait highly visible but not the other (Kenrick, McCreath, Govern, King, & Bordin, 1990).

Summary

Whereas social perception at zero acquaintance has provided evidence for the accurate perception of several traits, even higher levels of accuracy may be found if researchers study perceived affordances, examine social contexts that evoke physical qualities diagnostic of the attributes being perceived, and study perceivers who are attuned to those attributes. The study of perceived affordances is consistent with Kenny's (1993) call to investigate how perception predicts behavior in his appraisal of research on accuracy and consensus in interpersonal perception, and it also may prove useful in research on stereotype accuracy, where the emphasis on personality traits has been recently criticized (McCauley, 1995). The selection of significant social affordances to investigate may be informed by a taxon-

omy derived from interdependence theory (Kelley, 1979; Kelley & Thibaut, 1978), which Kelley (1997) has recently argued can be used to specify the "stimulus field" for interpersonal interactions. Research on perceived affordances may also be facilitated by methods for studying dyadic accuracy that measure a perceiver's accurate detection of qualities in different interaction partners that are unique to the relationship between perceiver and partner (e.g., DePaulo, Kenny, Hoover, Webb, & Oliver, 1987). However, as noted earlier, the accurate detection of affordances does not necessarily require that the detected qualities be unique to the relationship between perceiver and partner.

Conclusions

Whereas research investigating social perception at zero acquaintance has provided considerable evidence for the accurate perception of several traits, little progress has been made in identifying the physical qualities that inform accurate perceptions. In this article we illustrate the advantages of considering the accuracy of social perception at zero acquaintance within a Gibsonian theoretical framework. One advantage is that it emphasizes the capacity of configural and structured stimulation in the external world to inform accurate perception. The Gibsonian canon that structure in the physical world yields accurate perception without any probabilistic inferences stands in sharp contrast to the Brunswikian lens model that has been utilized in recent research. This canon also makes clear the need for a theoretical foundation from which to make predictions regarding the particular configurations of physical qualities that accurately convey psychological ones. Such a foundation is provided in this article by a developmental model that specifies four possible routes to a correspondence between physical and psychological qualities.

The analysis of possible routes to a correspondence between physical and psychological qualities points to various lines of research that must be pursued in order to make needed theoretical predictions regarding the physical qualities that can inform accurate social perception at zero acquaintance. One important area for future research involves identifying the perceiver expectancies that can produce self-fulfilling prophecy effects. Tenets of the ecological theory of social perception have been employed to derive five overgeneralization effects representing such expectancies. Each overgeneralization effect specifies particular configurations of physical qualities that will give rise to particular behavioral expectations and, via self-fulfilling prophecy effects, may create true relationships between physical and psychological qualities.

Another advantage of considering the accuracy of social perception within a Gibsonian framework is that

the focus on perceived affordances highlights the need to examine accuracy in a context that provides informative physical qualities to perceivers who will find that information useful. Moreover, the well-documented accuracy in social perception at zero acquaintance should prove even stronger when perceived affordances are examined both because strangers should be more highly attuned to affordances than to traits and also because the physical qualities available in a delimited social context are more likely to specify affordances than traits. Research examining perceived affordances should not only provide increased evidence of accuracy; it also has the advantage of providing a clear criterion for assessing it, namely whether the perceived opportunity for acting, interacting, or being acted upon is realized.

Accuracy research has made great gains in the years since a Gibsonian approach to social perception was proposed by McArthur and Baron (1983). It is our hope that the further articulation of the implications of such an approach provided in this article will generate research that shows even greater accuracy at zero acquaintance and that successfully identifies the structured physical qualities that make it possible.

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