The Role of Nonverbal Communication in Medical Interactions: Empirical Results, Theoretical Bases, and Methodological Issues

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Abstract

The goal of the present chapter is to provide an overview of the existing literature on nonverbal communication in the medical encounter. After introducing the different functions of nonverbal behavior and its importance in the medical context, we present empirical evidence showing how physician nonverbal behavior relates to different patient outcomes such as satisfaction, trust, or adherence. We then present different models and assessment tools with which nonverbal behavior in the medical encounter can be studied. The physician's ability to pick up and correctly interpret the patient's nonverbal cues (interpersonal sensitivity) and its impact on patient outcomes will be reviewed. We close the chapter by providing a summary of the main results and an outlook on open questions in the field.

Key Words: nonverbal behavior, nonverbal communication, physician-patient interaction, interpersonal sensitivity

In September 2011, the New York Times reported on a generous gift of $42 million given to the University of Chicago to create a training facility to improve doctors' bedside manners (Johnson, 2011). At the origin of this gift: a bad experience of Ms. Bucksbaum with a physician who treated her in an arrogant and brusque way. Such treatment is not only determined by a doctor's verbal statements, meaning by *what* he or she says, but also to a large extent by *how* a person is addressed and *how* information is conveyed through nonverbal behavior. Indeed, research demonstrates that nonverbal communication plays a crucial role in the medical encounter.

In the present chapter, we will first define what nonverbal communication is and present the most important findings pertaining to physician nonverbal communication and patient outcomes such as satisfaction, trust, and adherence. We will then shed light on possible theoretical perspectives under which nonverbal communication in the medical encounter can be studied, and we will present different nonverbal communication assessment measures. We will show that the physician's sensitivity to the patients' nonverbal cues (physician interpersonal sensitivity) is important, and we will show how it can be assessed. We end the chapter with a discussion about future research directions and open questions.

Research in the domain is usually conducted with physicians, and this is why we will use the term *physician* in this chapter. Note however that most of the findings and issues presented here are relevant for other health-care providers as well (e.g., nurses, social workers, psychologists).

What Is Nonverbal Communication?

Nonverbal communication is commonly defined as communication behavior without linguistic content (Knapp & Hall, 2010). Note that the

delimitation with verbal behavior is not always that clear cut (e.g., an emblem such as the gesture of "thumbs up" is a nonverbal gesture with a defined linguistic content). Typically, nonverbal behaviors expressed by different parts of the body are distinguished. Of particular interest often is the *face* with nonverbal behaviors including smiling, gazing, frowning, eyebrow raising, or, on a more general level, facial expressivity. Nonverbal behavior related to the body is expressed through *posture*, like arm and leg positions (crossed versus uncrossed), body orientation (toward the interaction partner or not), interpersonal distance, or through *gestures*, such as *emblematic* gestures (e.g., thumb up), *illustrative* gestures (e.g., indicate the size of an object), *regulating* gestures that coordinate the verbal exchange (e.g., to slightly open one's mouth and lean forward to manifest one's intention to speak), *adaptive* gestures that satisfy a personal need (e.g., scratching oneself to relieve a sensation of itching), or gestures that express *emotions* (e.g., to clench one's fist when expressing hostility). Nonverbal behavior related to the *voice* includes loudness, voice pitch (low versus high), monotony (versus variations), and speech rate.

Nonverbal communication serves different purposes, such as coordinating speech, signaling interpersonal orientations (e.g., attention, sympathy), expressing emotions, or conveying physiological states (e.g., pain) (Knapp & Hall, 2010). Also, nonverbal behavior often interacts with verbal behavior in that it can stress the verbal content, complement it, substitute for it, repeat it, regulate it, or even contradict it. Nonverbal behavior seems to have a certain primacy over the verbal content. Researchers estimate that less than 10% of affects and emotions are communicated verbally, the rest being conveyed by nonverbal cues (Ong, DeHaes, Hoos, & Lammes, 1995). Furthermore, when there is contradiction between what a person expresses verbally and what she or he expresses nonverbally (e.g., when someone says "I really like this" while adopting a stern facial expression conveying the opposite impression), people tend to trust the nonverbal expression more than the verbal one (Argyle, Alkema, & Gilmour, 1971). A potential explanation for this primacy of the nonverbal is that nonverbal displays are more difficult to hide or simulate than verbal ones.

One and the same nonverbal behavior can mean very different things, depending on factors such as behavior morphology (e.g., a sociable versus a Duchenne smile), features of the situation (e.g., interaction between strangers or friends), observer characteristics (e.g., gender, age), and on additional verbal and nonverbal behaviors that are produced simultaneously (what one calls behavioral composites; Knapp & Hall, 2010; Richmond & McCroskey, 1987). In other words, there is no such thing as a dictionary of nonverbal behavior providing unambiguous meanings attributable to specific nonverbal cue (Schmid Mast, Klöckner, & Hall, 2010).

According to interpersonal theories (e.g., Carson, 1969; Kiesler, 1983; Kiesler & Auerbach, 2003; Leary, 1957; Wiggins, 1979), interpersonal behavior can be mapped onto two main dimensions: affiliation and control. Given that the focus of our chapter is on nonverbal communication as it occurs in a social interaction (between physician and patient), we use these two dimensions to order and classify the different nonverbal behaviors investigated in the field. The dimension of affiliation is characterized by friendliness, warmth, caring, helping, and cooperating behaviors (Kiesler & Auerbach, 2003), and goes from an extreme of coldness and hostility to an extreme of warmth and friendliness. The dimension of control is characterized by dominance and controlling behaviors. It goes from an extreme of submissiveness to an extreme of dominance.

Encoders' nonverbal behaviors that are usually perceived by the interaction partner as affiliative are, for instance, eye contact, smiling, nodding, facial expressiveness, vocal back channels (e.g., "mmh," "uh-uh"), gestural behavior, soft touch of the interaction partner, face-to-face position with the interaction partner, forward lean, bodily relaxation, close interpersonal distance, and interactional synchrony (Anderson & Anderson, 1999). These affiliative behaviors can be expressed and perceived in various social interactions, including the physician patient one. Nonverbal behaviors that are generally perceived as indicators of dominance are, for instance, absence of smiling, visual dominance (relatively more percentage of gazing while speaking than percentage of gazing while listening), facial expressiveness, postural rigidity, standing close to the other(s), louder voice, interruptions, or long speaking times (Dovidio & Ellyson, 1982; Hall, Coats, & Smith LeBeau, 2005). The affiliation and dominance dimensions are also present in physician-patient interactions and offer a pertinent conceptual framework to study nonverbal communication in the medical encounter (Kiesler & Auerbach, 2003). This is why we will use this framework of the affiliation and the dominance dimensions to present the

existing results of the effect of physician nonverbal communication on patients.

How Does Physician Nonverbal Communication Affect Patient Outcomes?

Physician nonverbal communication has been shown to be linked to patient outcomes such as satisfaction, adherence, trust, patient behavior, and better health. Each of these outcomes will be reviewed separately in this section. In general, two types of physician nonverbal behavior are investigated: single, specific physician nonverbal cues (e.g., smiling, nodding) or so-called proximal percepts (i.e., global perceptions based on the physician's nonverbal behavior such as physician caring, involvement, or dominance). The first type consists of studies that inform about the specific cues that bring about the measured or observed effect (e.g., physician nodding is related to more patient satisfaction). In their review of this type of literature, Beck, Daughtridge, and Sloane (2002) showed that physician behaviors related to at least one positive patient outcome were head nodding, forward leaning, direct body orientation, uncrossed arms and legs, arm symmetry, and less mutual gaze. Because the cues are known, they can be taught and trained. However, this type of study says nothing about why a specific cue is related to a specific outcome. As an example, finding that physician nodding is related to patient satisfaction does not explain why it is so. Maybe physician nodding evokes perceived physician involvement, which then translates to more satisfaction. Or, physician nodding translates into feeling accepted by the physician and those positive affects are responsible for better satisfaction. The second type of studies, those in which global perceptions are assessed, can provide more information on the level of interpreting the nonverbal communication. However, when thinking about teaching, those studies provide less concrete information. As an example, if a study finds that a caring physician evokes more patient satisfaction, one needs to know what concrete behavior of the physician conveyed the impression of caring in order to be able to teach it to a physician. Ideally, the two types of studies are combined because they complement each other insofar as proximal percepts generally mediate (i.e., explain) the link between specific physician nonverbal cues and patient outcomes.

Patient Satisfaction

Of all patient outcomes, patient satisfaction is the one that has received the most research attention.

Among the types of nonverbal behaviors that have been related to patient satisfaction, affiliation behaviors play a particularly important role. Physician affiliative behaviors (also called *immediacy, rapport, warmth, communion,* or *caring* behaviors with minor differences in meaning) are physician behaviors that aim at establishing or maintaining a positive relationship with the patient through communicating friendliness, empathy, a desire to help, and a nonjudgmental attitude (Buller & Buller, 1987).

An early meta-analysis by Hall, Roter, and Katz (1988) had highlighted that patient satisfaction was related to physician affiliativeness (called *immediacy* by the authors and defined as physician gazing, touching the patient, leaning forward, facing orientation, and close interpersonal distance). A later literature review on both medical and psychotherapeutic contexts (Hall, Harrigan, & Rosenthal, 1995) showed that patient satisfaction was related to the following physician and therapist behaviors: less time reading the patient's chart, less touching of the patient, more forward leaning, more nods and gestures, and closer interpersonal distance. Finally, research focusing on house staff (Griffith, Wilson, Langer, & Haist, 2003) shows that patients are more satisfied when clinicians smile more, make more eye contact, lean forward, are facially and vocally more expressive, and gesture more. All the behaviors cited in this paragraph can be considered as caring or affiliative behaviors (Anderson & Anderson, 1999).

Aruguete and Roberts (2000) manipulated the communication style of a physician shown on a video to observe the reactions of participants (students) asked to imagine that they were facing the physician in a real medical interview and to report what their satisfaction would be. Participants were more satisfied when the physicians displayed affiliative behavior (operationalized nonverbally through a friendly facial expression, forward leaning, back-channel responses like "uh-huh" or "yeah," and open-ended questions) than when the physician displayed "controlling" behavior (operationalized nonverbally by sitting upright, using a neutral facial expression, and asking close-ended questions). This study demonstrated a causal link between physician nonverbal behavior and analogue patients' satisfaction.

Depending on situational factors and on the patient characteristics, physician affiliativeness (both verbal and nonverbal) can affect patients differently. Physician affiliativeness (rated by patients) had a stronger influence on patient satisfaction

when the patients were younger, had less severe illnesses, or had made less prior visits to the physician (i.e., who knew the physician less) (Buller & Buller, 1987). Also, an analysis of audiotapes of medical consultations showed that patients who are highly anxious (as judged from their voices by 144 independent judges) are less dissatisfied with physicians who sound angry, compared to patients who are less anxious (Hall, Roter, & Rand, 1981).

A second type of behavior is also important for predicting patient satisfaction: dominance behaviors. Patients are generally less satisfied with physicians who adopt high dominant nonverbal behaviors rather than low dominant ones (Bertakis, Roter, & Putnam, 1991; Burgoon et al., 1987; Hall, Irish, Roter, Ehrlich, & Miller, 1994). When physicians dominate the interview by talking more (Bertakis et al., 1991; Burgoon et al., 1987), or when they adopt a dominant tone of voice (as judged by independent raters) (Bertakis et al., 1991; Burgoon et al., 1987), patients report less satisfaction.

Research suggests that the impact of physician nonverbal behavior on patient satisfaction also depends on physician gender (Schmid Mast, Hall, Klöckner, & Choi, 2008). Student participants watched 2-minute videotape excerpts of real medical consultations and were asked to imagine that they were the patients facing these physicians and to report what their satisfaction would have been after the consultation. Results showed that the satisfaction with female physicians was particularly pronounced when these female physicians exhibited nonverbal behavior in line with the female gender roles (e.g., more gazing, more forward leaning, softer voice). At the same time, satisfaction with female physicians was also increased if they showed signs of professionalism (wearing a laboratory coat or having a medical-looking consultation room). Satisfaction with male physicians depended less on the physician's nonverbal communication than was the case for female physicians. Nevertheless, patient satisfaction with male physicians was higher when they adhered to behavior typical for the male gender role (e.g., louder voice, more interpersonal distance) (Schmid Mast, Hall, Klöckner, et al., 2008).

Patient Trust

Patient trust has been defined as the patient's belief that the physician is honest and competent, that he or she will preserve the patient's confidentiality, and that he or she will act in the patient's best interest (Fiscella et al., 2004; McKinstry, Ashcroft, Car, Freeman, & Sheikh, 2006). As shown in a recent literature review (Cousin, 2011), patients have more trust in their physicians when they perceive them as competent, affiliative (caring), and communicative (information sharing). Although information sharing pertains only to the verbal aspect of physician communication, the impressions of competence and affiliativeness are conveyed by both verbal and nonverbal cues. We still lack studies investigating which physician nonverbal behaviors are related to perceived physician competence (Cousin, 2011), but the link between physician nonverbal behavior and perceived physician affiliativeness is well documented (e.g., Anderson & Anderson, 1999). In the following paragraphs, we will review the nonverbal behaviors that have been associated with patient trust, while highlighting the mediating effect of perceived physician affiliativeness.

In a study by Aruguete and Roberts (2002), patients of a health clinic were randomly presented videos of actors portraying physicians. In the high affiliative conditions (concern), the physicians made moderate to high eye contact with the patient, rarely attended to the patient chart, used concerned facial expressions, smiled frequently at the patient, leaned in toward the patient, and was seated approximately two feet away from the doctor. In the low affiliative conditions (distance), the physicians made little eye contact, frequently attended to the chart, used neutral facial expressions, adopted a distant body posture, and were seated approximately four feet away from the patient. Results showed that patients had more trust in the high affiliative physicians than in the low affiliative ones.

Other affiliative behaviors have been shown to influence patient trust. Patients of physicians who report that their physicians greeted them more warmly, were more gentle during the examination (Thom 2001), and listened to them more (Keating, Gandhi, Orav, Bates, & Ayanian, 2004) also trust their physician more. Finally, length of the visit has also been related to patients' trust (Eggly et al. 2006; Fiscella et al. 2004; Keating et al. 2004); longer visits are associated with more patient trust.

Patient characteristics moderate the influence of affiliative behaviors on patient trust. Participants who watched silent videos of physicians varying in caring behavior (operationalized through different levels of smiling, eye contact, and nodding) reported how much trust they would have in the physicians in the video. Results showed that the personality trait of agreeableness influenced their reaction to the physician's level of affiliativeness (Cousin & Schmid Mast, 2011); the more agreeable

Patient Adherence

Physician nonverbal communication and particularly affiliativeness affect the patient's willingness to show adherence. Patient adherence (also called compliance) is understood as the patient's willingness or ability to conform to a treatment regimen, and, in particular, to medication (VandenBos, 2007). When exposed to a physician with increased affiliative nonverbal behavior (more eye contact with the patient, less look at patient chart, more concerned facial expressions, frequent smiling, forward leaning, and close distance), patients reported to be more willing to adhere to the treatment proposed by the physician (Aruguete & Roberts, 2002).

In a field experiment, physician touch increased patient adherence (Gueguen, Meneiri, & Charles-Sire, 2010). Patients of physicians who touched their patients on the forearm for 1–2 seconds at the end of the visit while saying, "It's very important for you to take your medication in order to prevent a reoccurrence" showed more medication adherence (antibiotics) one week later than patients of physicians who did not touch them while saying the same sentence. Again, perceived affiliativeness explained this influence of touch on adherence.

Patient Behavior

According to interpersonal theorists (e.g., Kiesler & Auerbach, 2003), people interacting usually achieve *correspondence* (also called "assimilation" or "congruence") in their behavior along the affiliation dimension (Sadler, Ethier, Gunn, Duong, & Woody, 2009). This means that if the physician behaves in a high affiliative way, the patient is prone to do likewise. Kiesler and Auerbach (2003) suggest that correspondence between patient and physician along the affiliation dimension should result in positive medical outcomes.

Interpersonal theorists (e.g., Kiesler & Auerbach, 2003) also predict that people interacting usually achieve *contrast* (also called "reciprocity") in their dominance behavior (Sadler et al., 2009; Schmid Mast, Hall, & Roter, 2008). This means that if the physician adopts a dominant interaction style, the patient is likely to show low dominance behavior. Furthermore, high contrast is associated with more liking of the interaction partner and more interpersonal comfort than low contrast (Tiedens & Fragale, 2003). These predictions have received some

empirical support also from the physician-patient research. With respect to correspondence, Street and Buller (1987) have shown that when the physician looked away from the patient or was not oriented toward the patient, the patient mirrored these nonaffiliative behaviors (correspondence). Contrary, when the physician spoke more, which can be considered as a dominance behavior, the patient showed the opposite behavior and spoke less (contrast). In line with these results supporting the hypothesis of a correspondence effect for affiliative behavior, research also shows that patients and physicians display more interactional synchrony when they feel at ease with their interaction partner (Koss & Rosenthal, 1997).

Other Outcomes

Other patient outcomes have been related to physician nonverbal behavior. *Recall of medical information* is associated with the physician's expression of nonverbal affiliativeness through more gaze, more forward lean, more touch, more facing orientation, and closer interpersonal distance with the patient (Hall et al., 1988), or through behaviors such as more eye contact with the patient, less look to the patient's chart, more concerned facial expressions, frequent smiling, forward leaning, and close distance (Aruguete & Roberts, 2002).

The latter behaviors (i.e., more eye contact with the patient, less look to the patient's chart, more concerned facial expressions, frequent smiling, forward leaning, and close distance) have been shown to positively influence *patient self-disclosure* (Aruguete & Roberts, 2002). Direct facial orientation and facial reinforcement (through nodding and facial animation) are additional physician behaviors that are positively associated with patients' self-disclosure (Duggan & Parrott, 2001).

Physicians who look at patients more notice more accurately patient psychological distress (Bensing, Kerssens, & van der Pasch, 1995). Also, physician facial expressiveness (i.e., a composite of smiling, nodding, and frowning) was associated with physical (i.e., mobility and level of activity) and cognitive functioning (e.g., ability to focus attention or to have a coherent speech) in elderly patients (N. Ambady, Koo, Rosenthal, & Winograd, 2002).

Regarding physician dominance, it has been shown that surgeons with a more dominant tone of voice are more likely to be sued by their patients than those who have a less dominant tone of voice (N. Ambady, LaPlante, et al., 2002).

In a nutshell, physician nonverbal communication that conveys affiliativeness seems to affects patient outcomes positively, whereas physician nonverbal communication that conveys dominance may have a negative effect on patient outcomes. Affiliativeness and dominance have been identified as the two core dimensions of patient centeredness (also called "control" versus "sharing") (e.g., Krupat, Hiam, Freeman, & Fleming, 1999; Krupat, Yeager, & Putnam, 2000). Patient centeredness (e.g., Mead & Bower, 2002; Stewart et al., 1995) has been defined as the adoption of a biopsychosocial perspective, thus taking into account the patient's perspective and his or her representation of the illness, as well as shared decision making regarding the agenda and the treatment (Mead & Bower, 2002). Stewart and colleagues (1995) stress that patient-centered physicians must aim at "understanding the patient as a whole person" (i.e., taking into account his or her familial, social, and cultural context) and must find a "common ground" with the patient (i.e., in negotiating the goals and the treatment). Besides the patient-centeredness framework, there are other theoretical frameworks that are important in the study of nonverbal communication in the medical encounter, and these will be reviewed in the next section.

Which Theories and Models Inform the Study of Physician-Patient Nonverbal Communication?

The field of physician-patient communication has sometimes been criticized for not being theoretical enough (Hall & Schmid Mast, 2009) and, indeed, few models exist about the role of nonverbal communication in the medical encounter. One reason for this lack might be that research in this field is relatively recent. We have already used the interpersonal theories approach (e.g., Kiesler & Auerbach, 2003) to order the results emerging from the literature, and we have linked the two dimensions of affiliativeness and dominance to the notion of patient centeredness (e.g., Mead & Bower, 2002; Stewart et al., 1995). Therefore, we will not review these two theoretical approaches in the current section. We will discuss in more detail the typology of physician-patient relationship (Roter & Hall, 2006), the E4 model for physician-patient communication (Keller & Carroll, 1994), and the parallel-process model of nonverbal communication (Patterson, 2006). All are examples of potentially useful theoretical frameworks or models for the investigation of physician-patient nonverbal communication. Note that some of the theories and models are not specific to nonverbal communication (e.g., the E4 model for physician-patient communication by Keller and Carroll, 1994), whereas others focus explicitly on nonverbal communication (e.g., parallel-process model of nonverbal communication (Patterson, 2006). Moreover, some models are specific to the physician-patient communication (e.g., the typology of physician-patient relationship by Roter and Hall, 2006), whereas other approaches can be used in the study of other types of interactions as well (e.g., parallel-process model of nonverbal communication; Patterson, 2006). The reader should, however, keep in mind that our review is not exhaustive, and that the number of theories, models, and conceptual frameworks that have been or could be used is much more important than the ones presented here.

The Typology of Physician-Patient Relationships

The physician-patient relationship can be characterized according to how control over the medical interaction (e.g.., regarding the setting of the agenda, the topic addressed, the questions that are asked, the decisions that are taken) is divided between the physician and the patient (Roter & Hall, 2006). Four prototypical types of physician-patient relationships emerge: *paternalism* (high physician control, low patient control), *consumerism* (high patient control, low physician control), *default* (low physician control, low patient control), and *mutuality* (high physician control, high patient control).

When the physician has a high level of control over the medical interaction and the patient has low control (e.g., when the physician sets the agenda of the visit without asking the patient or makes medical decisions without involving the patient or without considering the patient's desires or opinions), the physician-patient relationship can be characterized as *paternalistic*. This is usually considered as the traditional form of physician communication. To the extent that research shows that physician nonverbal behavior that encodes dominance and, thus, control has negative effects on patient outcomes, we can state that the more a relationship between a physician and a patient is paternalistic, the worse are the outcomes for the patient.

If the patient has more control over the medical interaction than the physician (e.g., if the patient sets the goals of the visits, and takes the final decisions regarding his or her treatment), the physician-patient relationship can be characterized

as a *consumerist* one. In such a relationship, the physician is mainly seen as providing a service (i.e., medical expertise) to a client.

When both the physician and the patient have low levels of control over the interaction (e.g., when the goals are unclear to both, when patients and physicians cannot negotiate the decisions, or when the physician's role is unclear), the term *default* characterizes the nature of the physician-patient relationship. In this kind of relationship, the patient typically sees his or her expectations unmet and the relationship stagnates or will be terminated by the unsatisfied patient.

Finally, when both the physician and the patient show high levels of control over the interaction (e.g., when they are both involved and see each other as equal partners, when patients and physicians share the decisions regarding the treatment), their relationship can be characterized as *mutual.* This last type of relationship is usually the one advocated as the best by researchers in the field of physician-patient communication (Roter & Hall, 2006), and it fits the notion of relationship-centered care (Beach & Inui, 2006) that advocates the reciprocal influence of the physician and the patient as one of its core ingredients (among other things such as seeing the patient as a person in his or her biopsychosocial context, acknowledging the importance of affect and emotions in the relationship, and valuing a genuine relationship).

The typology of physician-patient relationships suggests adopting a perspective of *relative* control or dominance among the patient and the physician. For instance, the distribution of speaking time during a medical encounter can be used as such a measure, and results show that the more the physician speaks during the medical encounter, the less the patient tends to talk (Street & Buller, 1987). Note that not much research has addressed the relative aspect of control or has looked at the difference or similarity in physician nonverbal behavior and patient nonverbal behavior. Often, only one is investigated in a given study, and, mostly, studies have been focusing on physician nonverbal behavior.

The E4 Model for Physician-Patient Communication

The E4 model for physician-patient communication was created by Keller and Carroll (1994) on the basis of a literature review and based on the authors' clinical experience. This theory was then applied in several workshops (according to the authors, more than 5,000 workshops conducted with 8,000 physicians) and benefited from feedback of the participating physicians. According to the E4 model, there are four communication tasks that the physician must perform: *engage, empathize, educate*, and *enlist. Engage* means setting the conditions for an engagement of both the patient and the physician in the communication process; *empathize* means showing empathy and creating a setting that is psychologically safe; *educate* refers to information sharing about the medical problem and checking for the patient's understanding; and *enlist* means including the patient in decision making and encouraging his or her adherence to the treatment. Although *educating* and *enlisting* mostly refer to verbal communication, *engaging* and *empathizing* are to be accomplished through verbal as well as through nonverbal communication.

According to the authors, *engaging* is communicated nonverbally through behaviors conveying interest in the patient, such as leaning forward and looking at him or her. *Empathizing* would be communicated nonverbally through eye contact, expressivity (opposite of "blank stare"), and non-interruptions (e.g., limitation of telephone calls or nurses' questions). The authors also advice not to write and listen at the same time, to look at the patient when listening to them or questioning them, to alternate listening and writing rather than doing them simultaneously, to sit or stand at the same level of eye height with the patient (because unequal height would convey dominance), and not to sit behind the desk (which may constitute a barrier between the physician and the patient).

Although not focusing exclusively on nonverbal communication, this model offers a useful framework to test potential associations between physician nonverbal behaviors and patient outcomes. As reviewed earlier, the model received some empirical support in that physician nonverbal behavior related to affiliativeness (which certainly includes aspects of showing engagement and empathy) was found to be related to positive patient outcomes. It would, however, be interesting to test whether perceived physician engagement and empathy result in positive patient outcomes and—more importantly in the current context—which physician nonverbal behaviors convey engagement and empathy to the patients.

The Parallel-Process Model of Nonverbal Communication

The parallel-process model of nonverbal communication (PPNC) (Patterson, 1995, 1999) is a broad

and relatively complex model that aims at describing the elements involved in the *dynamic* processing of nonverbal cues. It distinguishes between the encoder (or expresser or sender, who is the person emitting the nonverbal cues) and the decoder (or perceiver, who is the person reading or interpreting the nonverbal cues of the sender). Because of its high complexity, a detailed description is not possible here, but we will present some of its major characteristics.

The model retains a broad definition of nonverbal cues, which encompasses visual cues (e.g., facial expressions, gestures, or posture), as well as vocal cues (e.g., tone of voice, speech loudness), and physical characteristics (e.g., gender, age, appearance). The PPNC distinguishes three elements that explain encoding and decoding of nonverbal cues: (1) the *determinants* such as the culture, gender, or personality of the encoder and of the decoder; (2) the *social environment* that they face, which encompasses their interaction partner and the setting; and (3) *cognitive-affective components*, such as the encoder's and the decoder's interpersonal expectancies, affects, goals, and dispositions. All these elements shape and explain how nonverbal cues are processed, from the sender to the decoder, and influence the behavior and the impression formation of both the encoder and the decoder.

This model posits that even if encoding and decoding processes are usually studied separately (for the sake of clarity), they actually are interdependent. This means that encoders constantly adapt their nonverbal behaviors to what they infer of the perceiver's judgments (i.e., metajudgments) on their nonverbal behavior. To illustrate, if the encoder feels that his or her nonverbal behavior might be perceived as dominant by the decoder, he or she might readjust this behavior in order to appear less dominant. In other words, there is a permanent mutual influence between the encoder's and the decoder's impression formation and behavior.

Among many other things, the model distinguishes between rapid and automatic processing of nonverbal cues by the decoder, and slower and more elaborate forms of processing. More elaborate processing would be possible when (a) the decoder has sufficient resources available (e.g. intelligence, energy); (b) the decoder has sufficient motivation to do this additional processing; and (c) some elements make the decoder doubt about the accuracy of the initial inference.

This model has the advantage of offering a comprehensive review of the elements that explain the processing of nonverbal cues. The PPNC has been used by researchers of nonverbal communication, but, with a few exceptions (e.g., Takayama & Yamazaki, 2004), not in the field of physician-patient interaction. In offering a vast overview of the factors at stake in communication processing, and with its focus on the interactional and dynamic nature of nonverbal communication, it can, however, serve as a useful theoretical framework for researchers in this field. It also points to the necessity to investigate both physician and patient nonverbal communication simultaneously in a given interaction in order to obtain a clearer picture of the influence of physician nonverbal communication on patient outcomes.

How to Assess Nonverbal Communication in the Medical Encounter?

Different approaches exist for measuring physician (or patient) nonverbal communication in the medical encounter. They vary in whether a standardized or an ad hoc coding scheme is used, as well as in their level of detail and specificity (e.g., frequency of smiling versus global ratings of warmth). We will discuss the assessment of physician nonverbal communication with study-specific coding schemes and contrast them with the use of standardized coding schemes. Also, we will discuss studies that used manipulation of the physician's nonverbal communication to test its impact on patient outcomes.

Study-Specific Coding Schemes

Although there is a wide array of validated nonverbal assessment tools available (Manusov, 2005), only a few of them have been applied to the study of nonverbal communication in the medical encounter. Researchers have a tendency to create their own, study-specific coding schemes. The advantage of such tailored coding schemes is that they capture the nonverbal behavior the researcher really is after in a given study without having to code aspects that are not in the center of the research question. Also, the researcher can choose the level of detail or abstraction on which the nonverbal communication should be coded (e.g., single nonverbal behavior cues or global ratings conveying general impressions based on nonverbal behavior). They come, however, at the expense of the possibility to compare results among different studies, because the types of nonverbal behaviors assessed and how exactly they are coded is specific to each study and, thus, varies from one study to the other.

In study-specific coding schemes, either third uninvolved observers code the nonverbal behavior of the physician based on audio- or video-recordings or patients rate the physician's behavior at the end of the visit. In both cases, either specific nonverbal cues are coded (e.g., smiling, nodding, and frowning) or global ratings based on the observation of nonverbal communication are performed (e.g., affiliativeness or dominance). In the former case, the meaning of a specific nonverbal cue needs to be inferred, either through a correlation with another measure from the same study (e.g., physician speaking time is related to the physician being perceived as dominant by the patient) or it can be inferred based on existing knowledge on correlates of nonverbal behaviors (e.g., smiling is a sign of affiliativeness) (Schmid Mast et al., 2010). When nonverbal communication is measured through global ratings, the meaning is already attached to the coding category (e.g., dominance), but one lacks information about which specific nonverbal behavior of the physician is responsible for the impression of dominance. As argued before, such knowledge is important for physician training.

When patients rate their physician's nonverbal behavior at the end of the visit, they typically characterize the physician's behavior after the consultation by indicating, for instance, how much a list of adjectives describes the physician's behavior during the medical encounter (e.g., "open to patient concerns," "involved," "dominant"), using Likert scales (e.g., Thom, 2001). Besides such global ratings based on the physician's verbal and nonverbal behavior, patients might also be asked about the physician's specific nonverbal behavior (e.g., smiling). However, patients' ratings of the physician's behavior can be problematic for different reasons. First, patients are not objective observers. They are part of the physician-patient relationship, so their answers are not independent from other outcomes that the researcher investigates (e.g., patient satisfaction with the visit). Second, with this type of measure, it is not possible to know whether differences in the ratings come from differences in the physician's behavior or from differences in the patient's characteristics (e.g., some patients might be much more critical than others). Third, there might be an attentional or recall bias in patients' answers (i.e., some patients may pay more attention to certain behaviors than other patients, and some patients have a better memory than others), especially when patients are asked about their physician's behavior some time later, rather than directly after the visit

(e.g., through a telephone interview) (e.g., Keating et al., 2004).

Coding of the nonverbal communication in a medical encounter is extremely time-consuming. In order to limit the time spent on coding, researchers often use so-called *thin* slices (Ambady, Bernieri, & Richeson, 2000), namely excerpts of a videotaped interaction that are taken as representative of the entire videotaped interaction. These excerpts are brief (i.e., less than 5 min) and contain dynamic information (photographs do not qualify as thin slices) (Ambady et al., 2000). At least for certain behaviors (i.e., gaze, gestures, nodding, smiling, and touching), it seems that a 1-minute video is usually pretty representative of a 15-minute interaction (Murphy, 2005).

Another promising technological development aiming at dramatically decreasing the time for coding are so-called automatic sensing systems. These are devices such as microphones, cameras, or smart phones that register verbal and nonverbal behavior automatically in the field and, instead of using third-observer coding, specially developed computer algorithms code and analyze the recodings (e.g., Gatica-Perez, in press; McCowan, Lincoln, & Himayan, 2008). An example is the microcone, a device for identifying and recording up to six different speakers in a room with a software that permits to extract directly the speak turns, pauses, and interruptions of a conversation (Gatica-Perez, Lathoud, Odobez, & McCowan, 2007; Maganti, Gatica-Perez, & McCowan, 2007; McCowan et al., 2008). Another example consists of a computer algorithm that can identify the gazing direction of a person on a videotape and directly deliver the information about how long this person gazed at an interaction partner during a conversation, without human coders needing to pass hours watching and coding this behavior (Gatica-Perez, in press).

Standardized Coding Schemes

There are only a few established coding schemes that specifically measure the physician's nonverbal communication, and, as argued earlier, they are relatively rarely used. One of the most commonly used standardized coding schemes in the field of physician-patient communication is the Roter interaction analysis system (RIAS) (Roter & Larson, 2002). The RIAS was created to analyze mainly the verbal part of the physician's communication style. However, global affect ratings are also performed by the trained coders. On a 6-point Likert scale,

going from 1 (*low*) to 6 (*high*), coders are asked to rate the physician and the patient on the following dimensions: anger/irritation, anxiety/nervousness, depression/sadness (only patient), emotional distress/upset (only patient), dominance/assertiveness, interest/attentiveness, friendliness/warmth, responsiveness/engagement, sympathetic/empathetic, hurried/rushed, and respectfulness. Note that these global ratings are based on both verbal and nonverbal cues, and usually focus mostly on vocal qualities (such as voice tone, pitch, loudness, or variations).

Another example is the relational communication scale for observational measurement (RCS-O) (Gallagher, Hartung, Gerzina, Gregory, & Merolla, 2005), which consists of 34 items measuring physician *intimacy* with the patient, *composure, formality*, and *dominance*. Sample items are: "The physician was intensely involved in the conversation with the patient" (intimacy), "The physician was calm and poised with the patient" (composure), "The physician made the interaction very formal" (formality), or "The physician tried to control the conversation" (dominance). Again, this test does not clearly distinguish nonverbal behaviors from verbal ones (e.g., physician control over the conversation can be expressed either through nonverbal behaviors or through verbal ones or both). This scale has been used, for instance, by Gallagher, Gregory, Bianchi, Hartung, and Harkness (2005) who showed that the power difference (asymmetry) between the physician and patient—as expressed though the physician and the patient voice—is greater when the interview focuses on the biomedical aspects rather than on the psychosocial ones.

Similarly, the four habits coding scheme (FHCS) (Krupat, Frankel, Stein, & Irish, 2006) was created to assess the physician's communication style, without distinguishing its verbal and nonverbal components. This coding scheme consists of 23 items used by external raters to evaluate the physician communication style. These items are organized according to four categories of skills that the physicians should master according to the authors: invest in the beginning (Habit 1), elicit the patient's perspective (Habit 2), demonstrate empathy (Habit 3), and invest in the end (Habit 4). *Investing in the beginning* means, for instance, showing familiarity and warmth by talking to the patient, engaging in small talk, or eliciting the agenda with him or her; *eliciting the patient's perspective* means investigating the patient's representation of the medical problem, his or her goals in consulting the physician, and the impact of the medical problem on his or her

life; *demonstrating empathy* refers to the physician's encouraging the patient to express emotions, to showing acceptance of the patient's emotions, and adopting a nonverbal behavior that conveys interest and concern for the patient. *Investing in the end* refers to physician behaviors such as giving clear explanations to the patients, testing for his or her understanding, or involving him or her in the treatment decisions. This coding system has been used, for instance, to demonstrate that communication-skills training based on the four-habits model led to significant improvements in the physician's communication skills (Jensen et al., 2011). As in the previous coding schemes, the verbal and nonverbal aspects of the physician's communication are intertwined. To illustrate, one of the items is: "[the clinician] signals verbally and nonverbally that it is okay to express feeling." Therefore, it is not possible to isolate the nonverbal part of the physician's communication from its verbal part.

However, standardized coding schemes focusing exclusively on nonverbal communication are being developed. In particular, the Nonverbal Accommodation Analysis System (NAAS) (D'Agostino & Bylund, 2011) was created to analyze physician and patient accommodation (i.e., behavioral adaptation to each other) through nonverbal behavior during medical interviews. It codes the following physician and patient behaviors: eye contact, smiling, laughing, nodding, gesturing, talk time, pauses, simultaneous speech, speech rate, and interruption frequency. Coding rules are given for each of the nonverbal behaviors (e.g., smiling: "A relaxation of the facial features, with lips parted or closed, and with the corners of the lips turned upward. Proportion per minute calculated for each conversational party"). Inter-rater and intrarater reliability are good, which shows that the coding system is rather unambiguous and reliable. Preliminary validation tests show that it offers good convergent and discriminant validity too (D'Agostino & Bylund, 2011).

Manipulation of Nonverbal Behavior

The measures we have presented so far are typically used in correlational studies. To establish a causal relationship between a physician's (or patient's) nonverbal behavior and interaction outcomes, one needs an experimental design in which the physician (or patient) behavior is manipulated. Few studies have used such a manipulation (e.g., Aruguete & Roberts, 2000, 2002; Cousin & Schmid Mast, 2011; Gueguen et al., 2010).

Typically, a real physician or an actor portraying a physician delivers the same speech (i.e., the verbal content remains the same), while varying the nonverbal behavior from one condition to the other. To illustrate, in a study (Aruguete & Roberts, 2000) using a male and a female actors portraying physicians whose communication styles were either affiliative or controlling, the following manipulation was performed: In the high affiliative condition, the male or female physician used a friendly facial expressions, leaned forward, used back-channel responses (e.g., "uh-huh," "yeah"), gave suggestions, and asked open-ended questions. In the controlling condition, the physician used neutral facial expressions, sat upright, gave directions rather than suggestions, and asked closed-ended questions. This study demonstrated a causal link between the physician's affiliative communication style and the participant's satisfaction, trust, self-disclosure, and compliance. However, in this study, physician nonverbal behavior was not varied independently of the verbal behavior. Therefore, it is not possible to know whether the effects of the manipulation were due to the physician's nonverbal or verbal behavior. In another study, Aruguete and Roberts (2002), manipulated the nonverbal behavior only, by varying physician expressed concern versus distance. In the concern condition, the physician smiled frequently, made moderate to high contact with the patient, had concerned facial expressions, rarely attended to the patient's chart, leaned forward toward the patient, and sat 2 feet from him or her. In the distance condition, the physician made little eye contact with the patient, had neutral facial expressions, frequently attended to the patient's chart, displayed a more distant body posture, and sat 4 feet from the patient. Results showed that physician nonverbal expression of concern positively influenced patients' satisfaction, trust, self-disclosure, and recall of information.

Similarly, Cousin and Schmid Mast (2011) manipulated the physician's nonverbal behavior in presenting silent video excerpts of physicians who varied in their level of smiling, gazing, and nodding across the high affiliative and the low affiliative conditions. Physician's increase in affiliativeness positively influenced the participants' trust in the physician, their perception of the physician's competence, and their determination to adhere to the treatment.

In the three examples we just provided (Aruguete & Roberts, 2000, 2002; Cousin & Schmid Mast, 2011), analogue patients were tested. These are participants who were asked to imagine that they were in a medical situation but did not actually suffer from a real medical problem at the time the study was conducted. However, it is also possible to manipulate physician nonverbal communication during a real medical visit. Researchers (Gueguen et al., 2010) have shown that when the physician touched the patient at the end of the visit while stressing the importance of the patient following the treatment, actual medication adherence was better than when the physician did not touch the patient while saying exactly the same things.

With the latter kind of manipulation, the researchers can show that the nonverbal behavior of the physician has an impact on a given outcome. Furthermore, the real medical setting (rather than a laboratory setting) ensures good external validity to the findings. However, manipulations of the physician behavior are not always feasible. Such designs are difficult to implement, and some manipulations go against deontological and ethical standards. For obvious reasons, for instance, it would not be possible to manipulate physician hostility.

Physician Interpersonal Sensitivity

Another aspect of nonverbal communication in the medical setting is the physician's interpersonal sensitivity, defined as the physician's ability to draw accurate inferences about a person's states (e.g., emotions, attitudes, desires, needs) or traits (i.e., personality) based on this person's behavior, both verbal and nonverbal, and on this person's appearance (Hall & Bernieri, 2001). Sometimes, the term is used not only to describe accurate inferences, but also to describe a person's tendency to act and respond to others with tact (Hogan & Hogan, 1995) or to perceive criticism and rejection from others (e.g., Pilkonis, Kim, Proietti, & Barkham, 1996). Neither of these latter meanings will be used here.

Hall (2011) showed that physicians have relatively poor levels of interpersonal sensitivity (both verbal and nonverbal) regarding patients' emotional states, satisfaction with the visit, health beliefs, and views about their own health. Medical students, also, seem to be weaker than students from other disciplines (i.e., students who were not science majors) in decoding nonverbal cues (Giannini, Giannini, & Bowman, 2000).

Physicians' interpersonal sensitivity assessed with a standardized test (Profile of Nonverbal Sensitivity [PONS]; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979) has been positively related to their

patients' satisfaction (DiMatteo, Friedman, & Taranta, 1979; DiMatteo, Taranta, Friedman, & Prince, 1980) and to a higher rate of their patients' appointment keeping (DiMatteo, Hays, & Prince, 1986). Also, when physicians were more sensitive to emotional expression through body movement and posture (as measured by the PONS), patients' ratings of the physicians' interpersonal competence (perceived physician caring, helpfulness, and sensitivity) were higher (DiMatteo et al., 1980). Similarly, simulated patients preferred medical students who had increased nonverbal sensitivity and perceived them as higher in compassion.

Besides these positive effects, there might, however, also be some disadvantages for highly sensitive physicians. Physicians who scored higher on the PONS seemed to be overinclusive in their judgments of psychiatric problems (pathological anxiety and/or depression) when their judgments were compared with patients' answers to established questionnaires for detecting those psychiatric problems (Robbins, Kirmayer, Cathebras, Yaffe, & Dworkind, 1994).

It is important to note that self-perceived nonverbal sensitivity by physicians may not be a good indicator of their actual interpersonal sensitivity. Physicians who self-report that they are better able to accurately read emotions in their patients, are *less* accurate in detecting anxiety and depression in their patients than physicians who are more modest in reporting their level of interpersonal sensitivity (Robbins et al., 1994).

Following Hall (2011), interpersonal sensitivity is typically assessed either in vivo or with standardized tests. In vivo measurement refers to measures of interpersonal sensitivity assessed in a live interaction. Typically, patients and physicians are asked to answer the same questions (e.g., regarding the patient's feelings or attitudes), and higher correlations between their answers are taken as a sign of more pronounced physician interpersonal sensitivity. In vivo measures face methodological challenges. One of the major problems concerns the distinction between the decoder's interpersonal sensitivity and the encoder's level of expressiveness. When a person (decoder) is not able to correctly infer an interaction partner's traits or states, this may be due to two different things. Either this person shows a lack of interpersonal sensitivity, *or* the interaction partner was unexpressive and emitted few observable cues. Disentangling those two influences is difficult and requires additional analyses (e.g., analysis of videos) (Hall, 2011). Furthermore, this type of measure

does not distinguish the nonverbal influence from the verbal one. It is not possible to measure physician interpersonal sensitivity based only on the nonverbal behavior of the patient. The physician will always have the verbal and the nonverbal information available.

There are, however, a number of standardized interpersonal sensitivity tests available. With one exception, they are not specific for the physician-patient interaction. As an example, the aforementioned PONS (Rosenthal et al., 1979) consists of silent video excerpts in which a woman acts or reacts nonverbally to different social situations (e.g., she talks about her wedding, expresses strong dislike, orders food in a restaurant). For each video except, the observer has to choose which one is the right from two possible answer alternatives. Nonverbal behavior on the video excerpts is expressed through different channels: face, body, and voice. The PONS is the test most commonly used in assessing nonverbal sensitivity (e.g., DiMatteo et al., 1980).

Another widely used test is the diagnostic analysis of nonverbal accuracy (DANVA; Nowicki & Duke, 1994). The DANVA consists of 24 pictures of female and male individuals enacting four emotions (i.e., happiness, sadness, anger, and fear). These pictures are presented for 2 seconds after which the test taker indicates which of the four emotions was presented. It is a test that is specific to facial emotional displays and has been used by authors for the study of physician-patient interactions (Hall, Roter, Blanch, & Frankel, 2009).

There is one interpersonal sensitivity test specific to the physician-patient interaction available: the patient emotion cue test (PECT; Blanch-Hartigan, 2011). This test independently measures physician verbal and nonverbal sensitivity to patients' expressions of emotions. The PECT consists of 47 video clips in which an actress dynamically portrays a patient expressing an emotion (i.e., anger, sadness, happiness, anxiety, or confusion) or no emotion. These clips independently vary in verbal and nonverbal intensity (high, low, or neutral). Examples of verbal expressions are, "I completely disagree with you" (anger: high intensity), or "It was a whole week before he got the results back" (anger; low intensity). Examples of nonverbal expressions are intense gaze, increased rate of speech, eye rolling, furrowed brow, and heavy breathing (anger; high intensity), or moderate gaze, slightly increased rate of speech, moderate frowning, and slightly heavier breathing (anger; low intensity). Respondents have then

to indicate which emotion was portrayed (or if no emotion was portrayed) on a forced-choice response format. Preliminary validation tests show that reliability indices are modest and validity indices are adequate (notably through convergent validity with the DANVA and PONS measures of interpersonal sensitivity) (Blanch-Hartigan, 2011).

To summarize, physician interpersonal sensitivity has been mostly related to positive patient outcomes (i.e., satisfaction, appointment keeping, perceived competence of the physician), even if it may have a negative influence on some other aspects of the medical visit (e.g., physicians being overinclusive in their judgments of patient psychiatric problems). The measurement of interpersonal sensitivity is crucial, because live measurement and self-assessment pose many methodological problems. The use of standardized and validated tests (e.g., PONS, DANVA, PECT) will ensure the good quality of future research on this topic.

Conclusions and Future Directions

Research on nonverbal communication in the medical encounter is growing. We now have strong empirical evidence that physician nonverbal behavior has an impact on patients. For instance, research has demonstrated that the nonverbal expression of affiliativeness, through behaviors such as looking at the patient, nodding, or forward leaning, has a positive impact on patient satisfaction. Conversely, nonverbal dominance, in the form of long physician speaking time or dominant tone of voice, for instance, has a negative impact on satisfaction. Also, it has been shown that a physician's nonverbal behavior that expresses concern, for instance, through frequent eye contact, concerned facial expression, or close interpersonal distance, leads to more patient trust than a physician's behavior that conveys more distance. Regarding patient adherence, it has been shown that physician touching of the patient increases patient adherence with their medication.

Although the effect of physician nonverbal behavior on patient satisfaction, trust, and adherence is relatively firmly established by research using sound methodologies and experimental designs, its effect on other patient outcomes, such as patient health status or psychological distress, is still lacking. Studies on these outcomes typically rely on correlational designs (Crane & Crane, 2010; Hall, Horgan, Stein, & Roter, 2002). This can be problematic for interpretation. To illustrate, the association found by Ambady et al. (2002) between

physician expressiveness and elderly patients' health status can be due to the fact that patients reacted to the physician expressiveness (causal influence of the physician nonverbal behavior) and/or to the fact that physicians were more expressive when the patients were healthier (causal influence of the patients' health status). Future research will have to use appropriate methodologies in order to answer these questions.

The field of nonverbal communication in the medical encounter has often received the critique of not being theoretical enough (Hall & Schmid Mast, 2009). Even if this critique is not fully justified, it is true that researchers in the field still lack models for predicting specific patient outcomes from specific physicians' nonverbal behavior. Because actual research will probably continue to build evidence on the effect of physician nonverbal behavior on different patient outcomes, efforts will be needed to explain, on a theoretical level, the documented effects. Also, existing theories from the nonverbal literature as well as from other domains (e.g., interpersonal perception, verbal communication) may prove useful to ground future research. We have provided some examples of theories or models that can be useful to researchers in the field. Additionally, cross-fertilization between verbal and nonverbal theories may enhance the quality of research in both domains.

Regarding the measures and assessment tools in the field, it has to be noted that researchers have rarely used standardized instruments. Researchers often create their own criteria and coding rules. This is probably partly due to the fact that research in the field is relatively young and that researchers sometimes lack consensus on which nonverbal behaviors are worth measuring, and how. Also, different research questions might necessitate the assessment of different aspects of nonverbal behavior. Nevertheless, we hope that as coding systems specific to the physician-patient interaction will develop, researchers will use more reliable, valid, and comparable measures of nonverbal behavior.

As methodologies and theoretical underpinnings will develop, and results hopefully accumulate, researchers will probably try to refine their analyses and invest more in the search for individual and situational characteristics that moderate the links between physician (or patient) nonverbal behavior and patient outcomes. As we have shown, not all patients react equally to the same physician behavior, and situational factors play a role as well. Moreover, the interplay between the physician's and

the patient's nonverbal behavior and their separate or joint effect on consultation outcomes has rarely been studied. Note that although there exists research that looked at patient nonverbal behavior, the great majority of studies has investigated physician nonverbal behavior. This is also the reason that we focused on the effect of physician nonverbal behavior on patient outcome in the present chapter. To fully understand the impact of physician nonverbal behavior on patient outcome, it is crucial look at both physician and patient nonverbal behavior within one and the same study.

Furthermore, nonverbal behaviors have often been studied in isolation from each other, and we lack information about the interaction effects of patterns of behavior (behavioral composites) (Patterson, 1995). For instance, a smile might convey different meanings when associated with raised eyebrows (e.g., interest) than when associated with frowning (e.g., mockery). Furthermore, the interaction between the verbal and the nonverbal aspects of communication will need to be investigated. As Robinson (2006) reminds us, nonverbal behavior is intrinsically related to verbal behavior. However, this has not been seriously investigated so far (Crane & Crane, 2010). This is certainly another promising avenue of research for the field of research on the role of nonverbal communication in medical interactions.

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