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# Introductory Chapter: On the Road towards the Social-Adaptive Implication of Nonverbal Communication

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## 1. The adaptive use of nonverbal cues under various communicative contexts

The nonverbal communication is by nature socially adaptive and has high relevance to the real-world application. Latest research efforts have witnessed a boost in the empirical studies of nonverbal communication which have yielded significant discoveries. Minimally verbal and nonverbal cues can be effective in predicting individuals with autism [1], cerebral palsy [2], dementia [3], and traumatic brain injury patients [4]. The interpersonal resonance of nonverbal behaviors has a unique role in the early detection of psychiatric status. The synchronized nonverbal acts can predict some level of severity in social anxiety disorder [5]. The synchrony of movement and facial expressions is a diagnostic features of depression [6].

The communication of nonverbal signals can be essential in understanding patient-doctor interaction, and more recently in particular, in nursing houses between nurses and older adults [7], and about chronic disease management consultations between patients with cancer and their oncologists [8]. The perception of nonverbal communication skills in the emergency department is associated with the department's service quality and patient satisfaction [9, 10]. The doctor-patient synchrony can mediate the strength of the social group effects on the social group effects on the intergroup trust [11].

In terms of the application in social media and political communication, the video creators' nonverbal communication can impact viewer's intention to subscribe online media [12]. Sex differences existed in nonverbal cues marking political debates [13]. Communicating nonverbal cues in public speaking can be trained for the spokesperson to face the media in times of crisis [14]. The perceived debate style from nonverbal cues of a leadership role has an immediate impact on the perceiver's response on social media (e.g. Twitter [15]). As for the consequences in the real-world decision making, nonverbal presence can even predict the evaluations of one's hirability [16] in the recruiting situation, and can predict whether the volleyball game which the target player participated in is successful or not [17]. Moreover, the deception-related cues can bias legal decisions in the justice system [18], and have demonstrated to be useful in predicting forensic cases such as bribery [19].

Nonverbal cues are typically multimodal and often accompany linguistic messages with many forms to achieve an efficient communication. Nonverbal behaviors can reveal the speaker's characteristics of dominance, trust, composure [20], eloquence [21], persuasion [22], and guilt [23] and can facilitate one's understanding

of a variety of social emotion, and can even be an index of one's cultural competency [24]. Individual differences in speaker's voice pitch signals are consistently manipulated in speech and in various vocalizations such as screams, roars and pain cries [25]. A speaker's gaze patterns predict group interactions and his/her charisma [26]. Emoticon can sometimes be unintentional cues of the writer's emotion in email communication [27]. The perception of a speaker's emotion can rely on subtle nonverbal behaviors and its interaction with the contextual cues. Voice quality and breathiness conveyed in the moan of pleasure play roles in determining the meaning of human nonverbal vocalization in the perceiver [28]. The perception of vocal emotional cues is not context-invariant and appears to be modulated by sound context [29].

Nonverbal communication has also increasingly received attention in studies on education and human development. Scales are developed to quantify the developmental trajectory of nonverbal communication during childhood [30]. The context-aware augmentative and alternative communication system has been developed to assist school children with intellectual disability [31]. The social-communicative gestures at baseline can predict verbal and nonverbal development for children with autism [32].

A crucial question is whether the virtual technology, popularly growing during COVID-19, enhances or hinders interpersonal communication [33]. The prevalence of mobile technology has affected the children's ability to read nonverbal emotional cue of others [34]. The understanding of nonverbal communication cues of human personality traits can be essential in human-robot interaction [35]. Algorithms have been developed based on nonverbal behavioral features. Automatic recognition of nonverbal mimicry has been achieved in medical video consultations [36]. Virtual negotiation can be affected by nonverbal cues of speakers which is altered by automatic algorithm [37]. The facial expressions can be efficiently modeled and generated by FACSHuman, a software program [38].

## **2. The present book: Featuring the nonverbal communication in the real-world application**

These novel discoveries, summarized based on a cross-journal search and post-hoc comparisons of research papers, call for a proposal to systematically organize and plan a new book to address the nonverbal communication, its socio-adaptive nature and its various types.

In this book, we aim to respond to this call with several attempts. Our first endeavor is to reveal the novel approach to the classification and the training of nonverbal communication with advanced technologies.

Our second goal is to give a selective overview on the factors underlying the learning and the evaluation of nonverbal communications in educational settings and in digital worlds.

Our last effort is to characterize the latest advancement that uncovers the psychological nature underlying nonverbal communication in conversations and other applied settings.

Despite the topics relevant to other specific types of nonverbal communication (e.g. in drama and performing arts, etc.), the interesting works featured in this book, together with other contributions to the burgeoning field of nonverbal communication, have already demonstrated a promising new line of research to embed the study on nonverbal communication within an evolutionary and socio-adaptive perspective.

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