Some Suggestions for the Study of Stance in Communication

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Abstract— As **noted in a large number of studies in different fields (e.g. linguistics, psychology, sociolinguistics, etc.), the manner of interaction plays a key role in sharing information in communication. Discourse is an interactively developing activity between interlocutors, who express not only factual information in the form of spoken words but also their feelings and commitments with regard to what is being said. In face-to-face communication participants interact in such a way that they react to one another's multimodal positioning in the conversation. Often this means that they take a "stance". The goal of this paper is to explore the notion of stance through a review and discussion of some of the relevant literature and then relate this to what in research on social signal processing (SSP) is now being called "dispositional social stance". The main focus of the review is on the notion of stance in linguistics. This will be the point of departure for exploring other fields. In addition, consideration of the relation between gestural communication and expression of emotions will give a more complete view of how a stance is taken and upheld.**

Keywords: stance, affective, epistemic, multimodal communication

I. WHAT IS A STANCE? SETTING A FRAME FOR DISCUSSION

When investigating research on stance, we find many different approaches involving the phenomenon of "stance". To some extent they are looking at the same phenomenon using different perspectives (cf. Jaffe 2009). Starting in linguistics, Biber notes how the mechanisms used for personal expression have been the object of different studies using different labels for the same or very closely related phenomena, e.g. "evaluation", "evidentiality", "hedging", and "stance" [2], [3], [4]. Other examples are: studies on "appraisal" (e.g. [4], [5]), "positioning" (e.g., [6]), "attitude" (e.g., [7], [8]) "affect" (e.g., [9]) and "stance" (e.g., stance-taking in [10]), which are all related by having the available resources for expression of thoughts and feelings in human interaction (cf. [11]) as their object of study.

The corpus linguist Douglas Biber, one of the most influential investigators of stance, has characterized and defined *stance* in several slightly different ways; Biber and Finegan [12] write "By stance we mean the lexical and grammatical expression of attitudes, feelings, judgments, or commitment concerning the propositional content of a message. In Biber et al. [13] he writes "Stance: personal feelings, attitudes, judgments, or assessments that a speaker or writer has about the information in a proposition" and in [2], stance is the expression of one's personal viewpoint concerning proposed information. As we can see the definitions vary in respect to what mental phenomena are contained in a stance. The two first definitions both include attitudes, feelings, and judgments, but only the first includes commitments and only the second assessments. In the third definition, the phrase *personal viewpoint* has been adopted as a cover term for the mental phenomena concerned. The definitions also vary in respect to whether the mental side of a stance needs to be expressed at all. In the first and the third definition, a stance needs to be expressed, while in the definition of Biber et al. [13] (p.966), it does not. We can also see that while the first definition focuses on the lexical and grammatical expression of stance, the third definition leaves the nature of how stances are expressed open. In addition, all the definitions focus on the expression of individual speakers or writers rather than on interactive relations.

Another influential investigator of stance, the psychologist Klaus Scherer, provides the following characterization (rather than definition) of stance [14] (p. 705-706)): "Interpersonal stances. The specificity of this

category is that it is characteristic of an affective style that spontaneously develops or is strategically employed in the interaction with a person or a group of persons, coloring the interpersonal exchange in that situation (e.g. being polite, distant, cold, warm, supportive, contemptuous). Interpersonal stances are often triggered by events, such as encountering a certain person, but they are less shaped by spontaneous appraisal than by affect dispositions, interpersonal attitudes, and, most importantly, strategic intention. Thus, when an irritable person encounters a disliked individual there may be a somewhat higher probability of the person adopting an interpersonal stance of hostility in the interaction as compared to an agreeable person. Yet it seems important to distinguish this affective phenomenon from other types, because of its specific instantiation in an interpersonal encounter and the intentional, strategic character that may characterize the affective style used throughout the interaction.".

Scherer thus characterizes "stances" as "affective styles" mostly "shaped" by "affect dispositions, interpersonal attitudes and strategic intentions. In contradistinction to Biber, no specific characterizations are given of the mental or expressive side of stances but the examples that are provided have both aspects. As with Biber, there is a focus on the expression of individual speakers (or writers) rather than on the interactive relation.

Many authors have a social perspective on stance. One example is Du Bois [15], who writes: "The stance act thus creates three kinds of stance consequences at once. In taking a stance, the stance taker (1) evaluates an object, (2) positions a subject (usually the self), and (3) aligns with other subjects. The following definition sums it up:

Stance is a public act by a social actor, achieved dialogically through covert communicative means, of simultaneously evaluating objects, positioning subjects (self and others), and aligning with other subjects, with respect to any salient dimension of the sociocultural field." (p. 163)

His graphic representation of stance (a triangle) shows that communicative activity is dynamic, with contributions influencing the relations between discourse participants on the one side, and the topics of discussion on the other. In other words, the structure of interactive discourse is shaped both by individual contributions and the relations between them, with every contribution influencing the next, so that both communicating parties contribute with their positioning to the topic of discussion. A characteristic of both the definitions given by Du Bois and by Biber is that they perhaps have too wide a coverage, since it seems like any statement like *the house is red* or *it is raining* will involve a stance, given that statements always involve some kind of evaluation or judgment. As do in fact most other linguistic acts. A strange feature of the definition is that

Du Bois requires that stances should be expressed covertly. This seems to make the definition too narrow implying that their establishment is subconscious. Even if this is so sometimes, it seems too strong to require that this should always be the case for a stance to be expressed.

Many other authors have contributed to the investigation of stance, e.g. Precht [16] says that stance can be taken as "the expression of attitude, emotion, certainty and doubt". The author points out that, since stance is bound to socialization, its expression is bound to social and cultural context. Precht also cites Martin [17] who suggests that since stance implies positioning one's self, it is more an interpersonal experience than a subjective one. That is to say, the expression of one's viewpoint, very much depends on the interlocutor(s)'s and their way of expressing themselves. Kiesling [18], who makes a distinction between the relationship of a person to his/her own talk (called epistemic stance) and to the interlocutor (called interpersonal stance), claims that the expression of stance is the primary goal of the participants in a conversation. Thus many authors like Precht, Martin and Kiesling are stressing the interactional or intersubjective aspect of stance. This is also true of Keisanen [19], Kärkkäinen [20] and White [21].

Depending on the position a speaker takes towards what is contributed by an interlocutor, taking a stance can often be either an alignment or disalignment between discourse participants and their contributions in the discourse process [20]. Keisanen's work is a study on the role of tag questions and yes/no interrogatives in the act of positioning oneself or requiring positioning by the interlocutor, i.e. taking or requiring a stance in conversation. She comes to the conclusion that stance is an "interactional achievement […] an intersubjective, rather than primarily a subjective phenomenon" [20] (p. 177). Jaffe [1] adds that "stances are constructed across turns", rather than being the product of a single turn.

In fact, interaction has been suggested as the starting point for the taking of a stance (e.g., by Englebretson [10], Du Bois [15], and Keisanen [20]). Stance can be seen as "an articulated form of social action" (Du Bois [15], p. 137) or as the act of positioning oneself in the social act of discourse [16]. Duranti [22] claims that since stance-taking is a social act, it is directly related to the response of one's interlocutor, who is therefore always "co-author". If the interactive perspective is correct, this means that of our research should focus more on the interaction taking place in discourse and the expression of the results of the interaction process as observable in the contributions of the participants.

On the basis of the above review and discussion, we now want to suggest the following definition: Communicative Stance = Attitude which, for some time, is expressed and sustained interactively in communication, in a unimodal or multimodal manner. The qualification "for some time" means that normally a stance is not short term but sustained through a sequence of contributions. The term

"attitude" is to be taken in a wide sense including both epistemic and affective attitudes, thus encompassing most, if not all, mental phenomena mentioned by previous authors. The expressive side of a stance includes unimodal as well as multimodal vocal or gestural (in a wide sense including all communicative and informative body movements) verbal or nonverbal contributions. The stance can be based on affect dispositions, other interpersonal attitudes or strategic intentions and is mostly strongly dependent on the contributions of other communicators.

II. CLASSIFICATION OF STANCE

There is a considerable amount of work on the linguistic expression of stance in different languages: Finnish [23], Samoan [24], [25], Italian [26], Korean [27], Spanish [28], Sakapultek [29], Indonesian [30], Dutch [31] etc. For reasons of space, we will concentrate on English.

In the available literature on stance, a distinction is often made between epistemic and affective stance or between evidentiality/commitment and affect [32], [24]. An epistemic stance is related to the degree of certainty concerning the object of discussion, while affective stance is related to the emotional feelings about the object of discourse [24]. Epistemic stances are, for example, the certainty or uncertainty shown while answering a question, while an example of affective stance is happiness expressed verbally or with gestures as a reaction to a statement by an interlocutor. Sometimes also other types of stance have been suggested, such as manner of speaking.

Starting with the verbal expressions, stance is expressed by choice of certain words in conversation (especially adverbs, verbs, and adjectives) related to the epistemic or the affective dimension of the speaker's commitment to the discussion. Biber [2], [3] gives a list of lexico-grammatical features a speaker has at his/her disposal to take a stance and explains their function. He distinguishes three main grammatical resources, i.e. adverbs, complement clauses (controlled either by verbs, adjectives, or nouns) as well as modals and semi-modals.

Other relevant research concerns work on appraisal. Gales, in his study on appraisal in interpersonal threatening discourse, states that appraisal is composed of three systems, which he calls attitude, evaluation, and graduation [4]. Gales refers to the work of Martin and White [5], in order to give an explanation of the three systems. Thus, attitude is related to affect, which is the encoding of particular emotions (i.e., happiness, security, and satisfaction, both in their positive and negative aspects). Evaluation is related to judgment, which is the evaluation, both positive and negative, of behaviors in terms of their normality, capacity, tenacity, veracity, and propriety" [5] (p. 30). Graduation is related to appreciation, that is, the "aesthetic evaluation of things, phenomena, or processes" [4] [p. 30]. In Martin and White [5], attitude is given as the expression of feelings and evaluation is seen as an intersubjective stance, while graduation is used in discourse to remark intensity or amount. The same description of the construct of appraisal can be found in White [33], [17].

2.1 Epistemic Stance

As we have seen, a speaker may take an epistemic stance with regard to the content of his/her speech, e.g. the speaker expresses his/her degree of certainty towards the content [34]. A very influential study documenting the verbal means to do this can be found in Biber's work [2], [3] and [35], extended with some features to be found in [32]. Below, we present an overview of the lexico-grammatical features connected with epistemic stance suggested by Biber [2] and Biber and Finegan [32].

Adverbs:

- expressing certainty: e.g., actually, certainly, in fact, undoubtedly, obviously, assuredly, indeed, without doubt

- expressing likelihood/doubt: e.g., apparently, perhaps, possibly, evidently, predictably, roughly, allegedly, perhaps, supposedly

Modals:

- might, may, should, could

Stance complement clauses controlled by verbs:

- expressing certainty: e.g., conclude, determine, know, demonstrate, realize, show

- expressing likelihood/doubt: e.g., believe, doubt, think, appear, happen, seem, tend, believe, consider, hypothesize, predict, assume, indicate

Stance complement clauses controlled by adjectives:

- expressing certainty: e.g., certain, clear, obvious, sure, impossible, true

- expressing likelihood/doubt: e.g., (un)likely, possible, probable, alleged, dubious, uncertain

Stance complement clauses controlled by nouns:

- expressing certainty: e.g., conclusion, fact, observation, assertion, statement

- expressing likelihood/doubt: e.g., assumption, claim, observation, implication, opinion

The expression of epistemic stance can be signaled in conversation by the use of one or more of the above linguistic features or semantically similar ones. They basically express certainty or doubt about the topic of the conversation. The use of verbs to express commitment to the content of the conversation is extensively studied in by Keisanen [36], although she uses another terminology ("intellectual state" rather than "epistemic stance"). She notes that verbs like "to know", "to think", "to believe", and "to suppose" can be used to express epistemic stance. Keisanen's study is focused on the use of yes/no

questions and tag questions as requests for confirmation, signaling lack of information and perhaps of a certain degree of uncertainty. To cite just a few examples:

"Isn't that an oil tank?" (p. 92)

"You haven't really lived in the house during the winter, have you?" (p. 93)

"This isn't from Africa, is it?" (p. 96)

"We didn't do this last time, did we?" (p. 101)

These examples show that yes/no and tag questions imply lack of information and perhaps uncertainty in the speaker, who is requesting an answer from by his/her interlocutor.

Biber [37] and Simon-Vandenbergen [38] have studied the use of adverbs to express epistemic stance. For example, Simon-Vandenbergen [38] made an interesting study on the use of the adverbs "certainly" and "definitely". In her paper, Simon-Vandenbergen points out the similarity of the two adverbs, i.e. similarity of meaning and similarity of use, as well as differences.

Kärkkäinen [39], [23], [40] [41] studied the use of phrases such "I think", "I guess", "I thought", "I don't know", and "I remember". Such phrases, besides showing an epistemic relation to the content, might be used to relate the speaker to his/her interlocutor, thus influencing interaction in the conversation. Martin and White [5] point out how appealing to common opinions might have a relational function: for example, in the utterance "Everyone knows the banks are greedy" (p. 100) the phrase "everyone knows" introduces a degree of certainty by claiming consensual support for the speaker's claim.

Clift [42] focused on the use of reported speech, which is introduced by phrases like "I said" and "I told". Reported speech can be used to assess authority in a competitive conversation and Clift points out its interactive aspect.

Precht [43] studies how "evidentials" express uncertainty, doubt and commitment. In her study which is corpus-based, she makes a different categorization than Biber [2] and Biber and Finegan [32]. Evidentialty markers can be "mental verbs" (know, think, thought, look like, mean), "relationship verbs" (seem, appear), "reporting verbs" (read, heard), "adjectives" (sure, real, true), "adverbials" (maybe, probably, obviously, of course, absolutely, actually), and ""nouns" (fact, reason). Precht's study, thus, does not share the same way of categorizing linguistic features with regard to their epistemic function (cf. [43], p. 3), for example, "reporting verbs" like "read" and "heard" are put by Precht among epistemic verbs, while for Biber [3], for example, these verbs are simply regarded as communication verbs.

2.2 Stance as the Expression of Affect

Previous studies have often distinguished affective from epistemic stance, claiming that there is a "fundamental human need to express affect [44]. Ochs and Schieffelin [9] claim that affect includes the categories feeling, mood, disposition and attitude (as well as emotion) and state that affect can be expressed by means of verbal or non-verbal resources. Their study focuses on the linguistic expression of affect in various languages, in which English plays a minor role. Some of the linguistic features are: change of word order, code-switching, change of sounds in words (as in Italian), lexical features (interjections, descriptive terms vs personal names for humans, nicknames).

If we again turn to Biber's overview [2], [3], [35], extended with some features to be found in Biber and Finegan [32], we find the following examples in relation to the expression of affect.

Adverbs:

e.g., amazingly, importantly, surprisingly, happily, conveniently, luckily, alarmingly, disturbingly, sadly, even worse, astonishingly

Stance complement clauses controlled by verbs:

e.g., expect, hope, worry, enjoy, please, dread, embarrass, fear, feel, hope, wish, worry, hate, love

Stance complement clauses controlled by adjectives:

e.g., amazed/amazing, shocked, surprised, annoyed, nervous, fortunate, shocked, unnatural, afraid, disappointed, glad, happy, shocked, worried, relieved, sorry

Stance complement clauses controlled by nouns:

e.g., hope, view, thought, view, grounds

In Biber and Finegan [32], it is pointed out that affect expressions can be emphasized by using different linguistic features, like emphatics, hedges, certainty verbs, doubt verbs, possibility modals. Some examples are adverbs (e.g., "It was <u>really</u> nice") and verbs ("I <u>did</u> have a nice birthday"). Precht [16] also studies the expression of affective stance in English conversation. Her study is also corpus-based and shows similarities and differences in British and American language use. Some of her examples are:

- verbs: (I) love, (I) like

- adjectives: crazy, weird, funny, cool, pretty, bloody, lovely

- nouns: shit

- onomatopoetic: wow

Precht [43] compares the expression of stance in British and American English for adjectives (good, right, nice, funny, great, sorry, bad, bloody, lovely), nouns (problem, gee, god, sympathy), adverbials (unfortunately, sadly),

and verbs (want, need, like, love) and finds that affect is expressed with adjectives and verbs and that the particular choice of stance markers depends on the variety of English used by the speaker.

2.3 Other types of Stance?

Precht [16], citing Biber et al. [13], states that a third category of stance in discourse is "manner (related to style of speaking)", but does not analyze this category. In [43], she suggests four categories of stance markers, i.e., affect markers, evidentials (more or less the same as epistemic expressions), quantifiers and modal verbs, and gives some examples of quantifiers [43] (p.2): adjectives (e.g., all, more, most, whole, much) and adverbials (e.g., just, about, really, so, kind of, like, too, never). Modal verbs belonging to this group are: can, have to, must, have to, would, will. Quantifiers and modal verbs are problematic, since they can be used to modify the value of epistemic and affective features, while modals can be used to express uncertainty/likelihood (epistemic value).

One way to try to capture the stance function of quantifiers is to say that they can be used to express what could be described as a "faceless" stance [32]. In Biber's work [2], [3], [35] we find a large group of linguistic features classified as providing "faceless stance" Some of these are:

Modal and semi-modal verbs:

- permission/ability: can, could, may, might

- necessity/obligation: must, should, (had) better, have to, got to, ought to

- prediction/volition: will, would, shall

Style adverbs:

e.g., according to, confidentially, frankly, generally, honestly, mainly, technically, truthfully, typically, reportedly, primarily, usually

Stance complement clauses controlled by verbs:

- speech act/communication verbs: e.g., agree, announce, ask, assert, explain, insist, remind, say, state, suggest, tell, warn

- verbs of causation/modality/effort: e.g., allow, encourage, help, manage, order, persuade, try

Stance complement clauses controlled by adjectives:

- ability/willingness adjectives: e.g., (un)able, careful, inclined, ready

Stance complement clauses controlled by nouns:

e.g., agreement, decision, remark, proposal, tendency, wish

Usually, these expressions do not in themselves have an affective or epistemic stance function, but depending on the context, they might be part of an affective or epistemic stance.

Another attempt to find stances not related to the affective – epistemic relation is made by Scheibmann [45] who writes about the use of generalizations in English conversations. Since stance often implies having a relation to one's interlocutor(s), taking a stance means a positioning with regard to the object of discussion or the interlocutors. Generalizations relate to general classes and give a broadening function to discourse. They are subjective and at the same time they are a useful resource for creating an intersubjective relation. For example, they can indicate the position of the speaker in relation to the group. Another important function is their use for norms statements, thus contributing "to the construction and reproduction of cultural belief systems" [45] (p. 134).

Yet another example is Baratta's study on passive voice [46] which claims that by using the passive, an author or speaker takes a step back in a text or conversation, thus allowing the author/speaker to de-emphasize his/her own point of view.

2.4 Classification of Stance revisited

Even if the distinction between epistemic and affective stance is common in the literature, it is not without problems. Although a few verbs, like *know*, *believe*, and *think*, seem to be epistemic rather than affective, very many other states seem to be blends of affective and epistemic dimensions of meaning.

We see this already in attitudes, such as *feeling of doubt*, *feeling of certainty*, *feeling of uncertainty*, *feeling sure*, and perhaps even more clearly in attitudes likes *expectation, surprise, hope, amazement, astonishment, worry, dread* and *disappointment*. In all of these examples, epistemic and affective features are blended.

In a similar way, some states seem more affective than epistemic, like *being happy*, *angry* or *sad*. However, they all become more epistemic if made relational and directed to an epistemic object, i.e. *being happy (angry, sad) that it rains*. For the reasons given above, we suggest that the epistemic - affective distinction should not be used as a basis for a taxonomy of stances with mutually exclusive categories, rather it could be the basis of a feature classification, where a stance can be both epistemic and affective in nature.

As for the "faceless" stances associated with quantifiers and modal verbs, they do not so much seem to be stances as linguistic ways of modifying the expression of a particular stance since they can be used to modify the value of epistemic and affective features. This means that they could also be part of a feature classification through features such as "weak" or "strong".

III. STANCE-TAKING AND THE EXPRESSION OF EMOTIONS

In the previous sections we provided an overview of some of the verbal features for the expression of stance

in conversation. However, stances are not exclusively expressed by means of words. Affective stance is clearly linked with the expression of affect [48], [23], which is one of the basic needs of humans as social animals [44]. The importance of prosodic and gestural features when analyzing the process of stance-taking can be illustrated by considering the example "I really love football!" Would such a statement have the same effect (and meaning) if spoken with high pitch and a smile on the face as if with low pitch and a serious face?

Stance is "marked by tone of voice, duration, loudness, and other paralinguistic features" [32]. The role of prosody is, for instance, taken into consideration by Keisanen [36]. In her study on yes/no and tag questions, Keisanen notes that prosody is "connected to the expression of emotion" and comes to the conclusion that speech qualities such as high pitch, loudness, lengthening, etc. are "used to index some type of affective stance [36] (p. 39). The role of vocal cues in the expression of affect/emotion is the object of other studies. Scherer et al. [48] focus on the role of vocal cues in the act of deception, where intonation, voice quality, and rhythm are key vocal features. Russell, Bachorowsky, and Férnandez-Dols [49] point out how facial and vocal features are connected in the expression of emotion, referring to non-linguistic vocalizations and the role of the vocal component in speech as an indicator of a speaker's emotion. They also describe how emotions determine the facial display of a speaker in conversation. Important for stance are also different vocalizations which are not verbal, for example laughter (cf. Méhu [50]]. Laughter can not only indicate a limited number of affective states (stances), but can also elicit them from one's interlocutor [51], so that the social act of taking a stance becomes an interactive property.

So the expression of stance is not merely verbal. It also includes prosody and bodily features. In fact, Darwin [52] points out that emotions and stance are possible to communicate without using any vocal-verbal features (cf. Mehrabian [53]).

Face plays an important role in the expression of affect and affective stance. Following Darwin, six "basic universal" emotions are recognizable from face expressions, i.e. anger, disgust, fear, happiness, sadness, and surprise. Ekman [54] claims that facial expression and emotion are so connected that the former cannot exist without the latter and vice versa. Keltner and Ekman [55] stress how facial expressions indicate emotions better than any other communication feature.

Jakobs, Manstead, and Fischer [56] state that facial displays are determined by external factors (i.e. social situation) and internal factors (feelings or emotions), where the facial display is a reaction to the social component, which is interiorized and outwardly expressed as a facial display of emotions, and the intensity of a smiling expression is influenced by social context and the intensity of the social stimulus. Thus, the

interactional aspect of stance-taking is supported by the study of the expression of feelings.

The display of eyelids can determine the expression of different emotions (cf. Poggi, Spagnolo, & D'Errico [57]); different eyelids positions express different emotions.

Thus, when studying stance in its multimodal expressions, we need to study many different features that can be used to express stances, i.e., study the different amplitudes of a gesture, movement, sound, or position of body parts. These features can then also be used to recognize the stance that this might express.

Costa et al. [58] study the relation between embarrassment and gesture. The experiments made show how the affective stance and emotion "embarrassed" is expressed by facial features (lip movements, a non-Duchenne smile, gaze position), as well as movements of the head, hands, and the body of participants. The importance of body and body posture in face-to-face activities is summarized in Goodwin [59] (p. 69): "In face-to-face human interaction parties organize their bodies in concert with each other in ways that establish a public, shared focus of visual and cognitive attention". That is, the use of one's own body to expresses one's stance in face-to-face communication can have a major influence on the development of the interaction.

IV: STANCE AND SOCIAL SIGNAL PROCESSING

The area of automatic social signal processing includes at least three related areas

(i)   recognition, i.e. perception and understanding
(ii)   central processing, response reactions and formation and planning of future action on the basis of context sensitive perception
(iii)   generation, i.e. production of socially appropriate behavior.
        (cf. Vinciarelli et. al [60], [61])

Recognition, central processing and production of stance related activities are an important part of this. In a context sensitive way, systems must be able to recognize and produce stances involving unimodal and multimodal expressions. The relation between vocal verbal, prosodic and gestural means is here of special interest. Stance sensitive social signal processing must be capable of multimodal integration (fusion) and distribution (fission).

Another challenge concerns the interactive nature of stance creation and stance maintenance. It is not sufficient to focus on individual persons as stance takers in communication, the system must be able to recognize and participate in interactive stance creating patterns. This requires the ability to recognize and produce "social signals" as part of interactively produced shared states.

V. CONCLUSIONS

In this paper, we have had a look at some of the different features (written and vocal verbal, prosodic and gestural) speakers have at their disposal for taking a stance. We have seen that stance by many authors is claimed to be related to inter-subjectivity: the action of taking a stance in communication is a social act and is done through the coordination (and sometimes cooperation) of all participants in a communicative activity [15]. In other words, taking a stance is the personal expression of a social phenomenon, which is expressed using socially-determined expression features acquired by every single speaker through experience (cf. [62] and [63]). We have also seen that the inter-subjective aspect of stance taking is important, since communication and other face-to-face activities are social. Studies of stance and stance-taking should therefore focus both on the expression of a speaker's stance and the reaction it leads to in his/her interlocutors. Finally, we have noted that multimodal integration and distribution as well as interactivity are important also for the automatic processing of the social signals of stance.

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