Pedagogical Stance and its multimodal expression

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Abstract

The paper defines the notion of "pedagogical stance", viewed as the type of position taken, the role assumed, the image projected and the types of social behaviours performed by a teacher in her teaching interaction with a pupil. Two aspects of pedagogical stance, "didactic" and "affective – relational", are distinguished and a hypothesis is put forward about their determinant factors (the teacher's personality, idea of one's role and of the learning process, and model of the pupil). Based on a qualitative analysis of the verbal and bodily behaviour of teachers in a corpus of teacher-pupil interactions, the paper singles out two didactic stances (maieutic and efficient) and four affective-relational ones (friendly, dominating, paternalistic, and secure base). Some examples of these stances are analysed in detail and the respective patterns of verbal and behavioural signals that typically characterize the six types of stances are outlined.

Keywords: Teacher-pupil interaction. Stance. Verbal and multimodal signals of stance.

1. Stance: our position in the interaction

Within research on social interaction and the social signals contributing, in it, to information exchange, regulation, creation, maintenance or challenging of relational bonds, and sense making, an intriguing notion is one of stance. Stance may be viewed as the way in which an Agent during interaction positions him/herself toward the other and the topic of interaction; it includes the social relationship one wants to entertain with the other, the role one is fulfilling toward the other in that interaction, the presentation of self and evaluation of the other one wants to convey. A stance is then a more steady position than the propositional attitude embedded in uttering a sentence, but less long-lasting than a personality trait or an attitude: possibly stemming of a durational attitude, it is a specific and transient attitude one takes within a single interaction toward the other, the topic at issue and the interaction itself, during one or few interactional moves, and may change and be adjusted in the course of interaction based on the development of the relationship with the other.

In this work we deal with a particular kind of stance, that we call "pedagogical stance": the stance taken by a teacher toward pupils while interacting with them in his/her role of teacher. We first single out two dimensions of pedagogical stance, relational and didactic stance, and make hypotheses about their causal determinants, i.e., the processes leading a teacher to take a particular stance in a given interaction. Then we present an observational study to distinguish various types of stance in teachers and to find out the signals conveying the stance taken.

Finally we mention some uses of teacher's stance detection in human-human and human-computer interaction.

2. Related work

The notion of stance, or position, originated in the field of sociolinguistics (Goffman, 1981; Du Bois, 2007; Jaffe, 2009). Different approaches see it as a public act, performed in communication, by which a person evaluates an object positively or negatively, positioning oneself through alignment or misalignment with respect to it. For Du Bois (2007) stance is a "public act done by a social actor through communicative action (language, gestures and other symbolic forms) that transmits assessments compared to subjects and objects, allowing the positioning with respect to them". Jaffe (2009) defines stance as "taking a position with respect to the form or content of the utterance of the interlocutor". Kiesling (2009) adds the consideration of the relational level showing that the stance, beside being epistemic (how certain one is about one's assertion) may also be attitudinal, when it concerns a person's expression of his/her relationship to the interlocutors; hence the notion of "interpersonal stance", that can be, for example, friendly or dominating.

This expands the notion of stance to the relational level, by considering both power relations, and the flow of emotions that color interaction.

To consider stance in the interaction between teacher and pupil one must resort to the psychology of education, and to the concept of scaffolding. Commenting on Piaget's description of child development, Vygotskij (1978) proposed to consider not only what the child is already able to manage autonomously, but also what s/he can do with the help of a more knowledgeable one (parent, teacher, peer). The difference between the autonomous problem solving of the child and his assisted problem solving constitutes his "zone of proximal development" (ZPD, Chaiklin, 2003), and one of the main tasks of teacher is to help their pupils to develop their ZPD at their best. This is done, according to Wood et al. (1976)

through "scaffolding" processes, by which teachers help their pupils to gradually interiorize the help received during joint problem solving. To bring about a scaffolding process the teacher must disambiguate a problem solving that is too complex for the child, starting to help the pupil to jointly face a problem that is within his reach (that lays in the child's ZPD), but only if helped..

Based on Bruner's (1986) framework, Bransford et al. (2000) singled out the necessary steps of a successful scaffolding interaction. To help a pupil to grasp the lacking abilities needed to solve a problem, a teachers should 1. motivate or enlist the child's interest related to the task, 2 simplify the task to make it more manageable, 3. provide some direction to help the child focus on the goal, 4. clearly indicate differences between the child's work and the standard or desired solution, 5. reduce frustration and risk, 6. define the expectations of the activity to be performed.

3. Pedagogical Stance. A teacher's : our position toward the pupil

At any moment of interaction with other people we all take a particular stance, a position toward ourselves, others, and our interaction. The stance is generally determined by who is the person we are interacting with, the role (we believe) we have with respect to him/her, the type of social situation in which we are; but even during the same interaction we may occasionally change our stance, based on new information that may trigger different goals about the interaction or a different view of our role in it. Take a mother having small-talk with her 20 years old daughter who has been living alone since some months. She might not be, presently, talking in her role as mother but simply in the role of a friend. Yet, suppose that while talking about her daughter's friends she comes to know a married man is courting her; she may suddenly switch from a friendly to a maternal stance, and start to give advice instead of simply commenting on this. In the same way, a teacher, during interaction with her pupils, may sometimes take a stance that is not typical of a teacher; but usually s/he interacts with them by taking a "pedagogical stance": an interactional position determined by the role she has towards them as their teacher. By "pedagogical stance" we mean the kind of stance that a teacher generally takes in his/her interactions with pupils in order to fulfill her role-goals as a teacher, that is, the goals s/he has as determined by her professional role of teacher. This position may differ across teachers and situations, and according to pupils; different teachers in the same situation, or the same teacher in different situations may take different pedagogical stances, and the specific pedagogical stance taken may in principle change during a single chunk of interaction. So, various types of pedagogical stances can be distinguished. The specific pedagogical stance taken by a teacher is in itself an internal mental state, i.e., a set of beliefs and goals driving the interaction toward the pupil, and may be manifested in a set of communicative and non-communicative behaviors that the teacher performs while interacting with the pupil(s). These behaviors may be performed at an aware or unaware level by the teacher, but they are in any case very important since they give the pupil the "flavor" of his/her interaction with the teacher, and have relevant effects on his/her processes of cognition, learning, and social relationship with the teacher and school in general.

The goal of our work is to distinguish a set of pedagogical stances in the communicative and non-communicative behavior of teachers, and to single out the features of behavior in all modalities (words, actions, non-actions, gestures, postures, position, gaze, facial expressions, distance) that characterize each type of pedagogical stance.

4. Roots of a pedagogical stance

In our hypothesis, the specific pedagogical stance taken, i.e. what the teacher thinks s/he must do and the role s/he thinks she must fulfill, at a given moment while interacting with a given pupil (or group of pupils) is determined by a number of factors:

a.The teacher's view of one's professional role

The teacher's idea of what one's role toward a pupil is entails a view about the goals a teacher should pursue, and the tasks to fulfill in working with the student. It is different, for instance, if you view the teacher as mainly a worker of cultural transmission and cognitive formation, or else a helping professional, like doctors, nurses, psychologists. For the "cultural operator", the most important goals of her work are to care and develop the students' cognitive skills and enhance their knowledge, while for the "helping professional" it is mostly important enhance the student's self-esteem, sense of efficacy, social and emotional competence.

b. The teacher's teaching and learning theory

Within the teacher's view of learning, and consequently of the job of teaching, three aspects can be distinguished.

i. transmissive vs. constructive learning process.

Two diverging views of teaching and learning are the traditional "transmissive" model, viewing teaching as the transmission of notions and competences from teacher to pupils versus the "constructionist" view (Bruner, 1986) that sees learning as an active construction of knowledge and competence, mainly based on direct experience and inductive discovery of general laws. While the teacher's image and required skills stemming from the former view are ones of clear and systematic explanation, those linked to the latter view include the capacity to create problem situations to solicit inductive understanding and problem solving skills in students. In the former the teacher cares one's own communication of notions more than leaving room for the student's exploration.

ii. performance vs. mastery oriented.

According to Dweck (1999) while studying or trying to solve a problem a student may be more oriented either to the result or to the process, either to an effective output or to enhance one's general mastery. In the same vein, teachers may privilege one or the other objective in teaching and assessing students' work. Those mastery- focused care the pupil's cognitive processes more than the bare result of their work.

iii. importance attributed to emotional factors.

People may perform bad under conditions of anxiety and well thanks to enthusiasm (Csikszentmihaly, 1993). Some teachers are highly aware of the importance of emotions in determining learning motivation, and try to elicit positive ones (amusement, curiosity, pride), or negative ones (fear or shame), according to which they think have a higher motivating power.

iv. importance attributed to relational factors.

The relationship with pupils set by a teacher may also importantly determine learning motivation and learning, and some teachers consider their social and affective relationships with students as an important part of their role. Also relevant in this connection is the type of leadership they feel they should have in front of the class, whether democratic or authoritarian leader, which may determine the type of stance they take in classroom interaction.

c. The teacher's model of the student

The stance taken is also determined by the teacher's idea of the cognitive skills and consequent pedagogical needs of the pupil. This "model" of the pupil can be made up after a first observation of what the pupil is doing, or be retrieved from memory of past interactions or other information, sometimes possibly resulting in the teacher's prejudice.

d. The teacher's personality

The way in which a teacher interacts with the pupil is in part determined also by how extraverted, anxious, rigid or self-confident s/he is.

5. Didactic stance and Affective – relational stance

Based on these determinants of the teacher's pedagogical stance, we can distinguish two aspects of it: a "didactic stance" and an "affective – relational stance".

By "didactic stance" we mean the stance taken by the teacher for what concerns the cognitive goals of her role: the specific ways in which s/he intends to develop the students' skills and bringabout their learning, or simply to lead their study or problem solving. So a teacher may take a constructionist vs. a transmissive stance, s/he may be more performance vs. mastery oriented.

By "affective – relational stance" we mean the type of teacher-student relationship the teacher wants to

entertain with the pupil, and the type of emotions or the general mood she wants to elicit in the pupil. A teacher may tend to take a maternal vs. a friendly or an authoritarian stance; she may have a playful stance, vs. a rigid or serious, shaming, "guilt inducing", or scaring stance.

6. How to detect Stances

The problem we confront in this work is to find the verbal, behavioral, expressive cues that typically externalize the different types of stance a teacher is taking during interaction with a pupil. Since this is but a first work on this topic, in this Section we simply make some general predictions as to what those cues may be, while in Section 7. we provide evidence of their plausibility through some first qualitative analyses of teachers' multimodal behavior.

Our first prediction is that aspects of "didactic stance" are more typically (even if not exclusively) conveyed by the teacher's verbal behavior, while those of "affective – relational stance" are more frequently or easily expressed by bodily behaviors.

A first prediction might be, for instance, that a "transmissive" didactic stance is typically expressed by a teacher who talks a lot, mainly using informative speech acts, or, in case of procedural tasks, requestive speech act. On the contrary, a teacher taking a more "constructive" didactic stance will typically speak much less than a transmissive one, and when speaking will elicit observation and reflections through interrogative speech acts. Or else, s/he might use informative speech acts especially after having offered something to do, some problem to solve, some datum to analyze, to the student, in order to reorganize his/her inductive reasoning.

As to the "affective – relational stance", we predict it can be more clearly detected by bodily behaviors like posture, bust and head position, gaze direction, smile, and distance. More specifically, a friendly stance, as opposed to an authoritarian stance, will be expressed by short distance, converging direction of the teacher's and pupil's trunk and head, occurrence of smile concomitant to mutual gaze, and a fair level of mimicry, synchronization and parallelism between pupil's and teacher's position and movements.

Of course, though, this "specialization" of verbal cues in expressing didactic stance and bodily cues for affective - relational stance is not rigid. For example, a frequent use of iconic gestures may indicate a particular sensitivity of the teacher to the need of a pupil for perceptual evidence and concrete information, while after a certain age of the pupil it may unmask too high a tendency to facilitate him/her the task. In any case, it is a cue to a particular didactic stance. On the other hand, a high frequency of speech acts of praise or reproach indicate aspects of the teacher's affective-relational stance, e.g. his/her playing the judging teacher.

7. Pedagogical Stance. An observational study

To test the plausibility of our predictions, we conducted a qualitative observational study on a corpus of dyadic interactions between teachers and pupils.

7.1. Method

To single out types of pedagogical stance and their respective multimodal signals, we analyzed 36 fragments for a total of 100 minutes from a corpus of thirty videos of teacher-pupil dyadic interactions collected in an experiment about helping and overhelping behaviors. by thirty female Italian (Leone, 2009; D'Errico et al., 2011; Leone, 2011) 29 female Italian teachers of primary schools near Rome were videotaped each while interacting with one of her 7-8 years old pupils doing a role game. In each fragment analyzed the teacher stands by a pupil who has to solve a problem (make a puzzle to find out a magic word) that is, in fact, perfectly within the pupil's reach, and she has been told that she may help the pupil or not. Although originally created to let the helping overhelping behaviors of teachers emerge, this setting is particularly apt to catch some relevant aspects of pedagogical stances too. First, the setting is organized and presented to participants as a game simulation, in which the child plays the main character and the teacher plays the role of an adult caring for the child. Thus the psychological worries of both participants linked to the fear of making mistakes or unsuccessful behaviors are expected to appear as relatively unimportant, while the informal setting fosters the possibilities for participants to explore this unconventional situation using trial-and-error strategies. Being in a game, both adult and child are supposed to act considering as real a fictive scenario, in which children are invited to do their best to cope with a simple task, presenting no relevant difficulties to be managed autonomously, and teachers are invited to side their pupils as the usually do. Further, the setting is quite ecological since each teacher interacts with a pupil attending his/her everyday teaching and the interaction is expected to be similar to one occurring in school. However, the game nature of this setting stresses some aspects more than others: it shadows all problems related to evaluation of the pupils' formal achievements, and makes more evident all the intermediate steps eventually conducting to the solving of the game. For the children, it leaves room for exploratory efforts, lucky guess and, more generally, all sorts of tentative behaviors. For the teachers, it makes more evident such behaviors as offering cooperative hints, encouragement, and minimization of failures' worries on the part of children. Another consequence of the fictive scenario is that, being different from any other school routine (explaining a lesson, doing an exercise, checking a homework, etc.), the game simulation setting offers a good example of a fuzzy social situation, requiring a free "on the spot" interpretation by participants. While for children a game may look a more familiar situation, for the teachers it is a more puzzling one. Observing them while offering their pupils help for facing a social situation that is new for them can make

protective social behaviors more likely emerge. A final feature that makes this setting particularly apt to assess not only the didactic but also the affective – relational side of pedagogical stance is the young age of the pupils (attending their second or third year of primary school), which likely can evidence those aspects of explicit affective reassuring (smiling, touching the child's face or arm, playing little games…) that are typical of these first stages of teacher-pupil interaction, but are expected to become less explicit and frequent when interacting with older students.

7.2 Analysis

After impressionistic observation of the whole corpus of dyadic interactions, 12 fragments were selected as representing different pedagogical stances, and for each fragment the verbal and bodily behavior of the teacher was transcribed and analyzed.

The verbal and gestural behavior was classified in terms of speech acts or communicative acts, while behavior in all body modalities was coded in terms of the following coding scheme:

trunk : erected / forward / backward
head : erected / forward / backward / head canting
gaze direction: to task (shared/nonshared) / onto pupil / to pupil (=mutual)
smile: shared /nonshared (about the same topic)
hands / arms position: on table, close to hip, behind back, behind neck, chin, mouth, pupil's chair
distance: short / default / long
reciprocal position: default / mirror / parallel

The teacher's trunk may be erected, leaning forward, or backward. Head may have the same positions plus head canting, that is, it can be tilted aside. Gaze may be directed toward the task (the puzzle on the table) and in this case it is coded as shared if at the same time the pupil is directing his gaze to the task too, and non-shared if, for example, the teacher is looking at the pieces while the pupil is looking at the puzzle being done. If it is not directed to the task, the teacher's gaze may be either directed to the pupil, but only looking at him/her as an external observer, or looking at the pupil's eyes (mutual gaze).
Smile is considered shared if it is performed about the same topic by teacher and student, and non shared if it is about different topics or at different times.
The position of hands and arms may be on the table, close to hip, behind back, behind neck, on chin or mouth, or finally touching the pupil's chair.
The distance between teacher and pupil may be short (less than 30 cm.) default (between 30 and 50 cm.) and long (more than 50 cm.).
Finally, the reciprocal position of teacher and pupil may be, beside default, either one of mirroring (both doing the same action, in a relation of specularity) or one of parallelism (their trunks and heads move keeping parallel to one another).
Of course, it is not only important to analyze each of these features as taken by itself, but also its dynamic relation with preceding and subsequent behavior. For example, trunk leaning backward from the beginning

of an interaction may signal that the teacher is not taking a warm stance toward the pupil, preferring to keep distant from him; but if it follows a previous forward position it may convey that, after seeing that the pupil has found his way, she lets him do by himself.

7.3. Results

After analysis of the selected fragments, a first set of two didactic and four affective relational stances were singled out and defined as follows:

Didactic stances:
1. Maieutic: A maieutic stance is oriented more to mastery than to performance, and pursues it mainly be fostering the pupil's autonomy, soliciting a constructive learning, and accepting errors as a step toward comprehension
2. Efficient: More aimed at performance, it implies a tendency to lead or direct the pupil's behavior while preventing errors and not leaving him/her free to explore and experiment unpredicted solutions.

Affective – relational stances:
1. Friendly: The teacher establishes a peer, close and warm relationship with the pupil, while avoiding to judge him/her. In some cases she even adopts a playful stance, interacting with him as if she were playing and joking, and showing amusement in staying with him.
2. Dominating: the teacher directs the pupil's behavior. She wants him to do readily and only what she wants, she is very checking and judging, and only as soon as s/he does what she wants, she praises the pupil
3. Paternalistic. The teacher is in fact quite directive, she definitely wants the child to do what she wants, but while masking his/her dominance by a close and seemingly friendly relationship.
4. Secure base: the teacher leaves the child do by himself but she stands by him/her, by letting the pupil feel that she is there just in case s/he needs help.

Given the qualitative and exploratory nature of this first study, this list may not be exhaustive. Let us here describe the behavior of some teachers that well exemplify these stances, by evidencing the communicative and expressive signals and cues that characterize them.

7.3.1. Maieutic stance.
A good example of maieutic stance is Teacher 1. She can be seen as maieutic because she seems to have a constructivist view of learning, and to be more oriented to mastery than to performance, as witnessed by the following details.
1. She mainly uses interrogative rather than assertive or directive speech acts, thus avoiding direct statements that would rigidly lead the pupil, but

preferring to let him reach conclusions by his very reasoning and cognitive processing.

> (1) The teacher asks: *che forma stai cercando?* (what a shape are you looking for?) and, while *pointing with her left index finger*, asks: *Che forma è questa? Cosa ci ricorda questa forma qui?* (what shape is this? What does this shape remind us?)

> (2) The boy *puts some pieces into the puzzle*. She asks him: *Poi?* (So then?)

She solicits his reasoning, and promotes an active attitude by the pupil.
2. The teacher is not an interventionists, rather she leaves the boy go on in his attempts, intervening only when she sees him in trouble.

> (3) The teacher, as usually, *is keeping her left arm leaning still on the table*. At a certain moment the boy *scratches his left temple with his left hand*. She says: *Allora, guardala un po'?* (then, look at it?). Then she *raises her left hand and puts a piece closer to the puzzle*. But immediately, after she sees he started putting pieces again, while *she had already started to move her hand, she puts it back on the table*.

Sometimes, she even stops her own movement or clearly gives up to do something herself.
3. The teacher often makes use of mirroring, a technique used by Rogers (1970) for his non-directive dialogue and often exploited as a technique of non-authoritarian education in teacher – pupil interaction (Lumbelli, 1979). Mirroring consists in the teacher's simply repeating what the pupil says, possibly in a paraphrased manner, to let him elaborate his meanings himself, often also with a function of communicating empathy. Here is a clear example of mirroring.
> (4) The pupil, while *looking at a piece* of the puzzle still on the table, says: *Questo non può essere perché **non c'è…. l'attaccatura**.* (This cannot be it, because there is no attach point).
> The teacher says: ***Non c'è l'attaccatura**. Che attaccatura stai cercando?* (There is no attach point. What an attach point are you looking for?)

7.3.2. Friendly stance.
Teacher 1. also provides an example of **friendly** stance, that is, one not too authoritarian nor too maternal a stance toward the pupil, as appears from the following details.
1. She is not keeping distance from the pupil. As is clear all along the fragment, she sits down very close to the boy; a proxemic cue (Hall, 1970) conveying a friendly stance toward the pupil.
2. Parallelisms hold with the pupil's body position and behaviors. An example.
> (5) From 7.18 through 7.32 *the teacher's gaze follows the pupil's*, alternatively *shifting from the table to the puzzle at the same time* as he does.
3. Positive social emotions. The teacher *often smiles*, not only while looking at the pupil, but also by herself, sometimes with a smile that looks one of tenderness.
4. Gaze "with" the pupil, not "onto" the pupil. Teacher 1. frequently shows a *"gaze on task"* shared with the pupil.
5. Irony. This teacher, in the rare cases in which she provides suggestions to the pupil, makes use of irony:
> (6) The boy *has put a piece* into the puzzle, but turned the other way around. The teacher *points at it by her left hand*

while asking: *E' nel verso giusto questa lettera?* (is this letter the right direction?). Then she *shakes her head* and *shrugs her shoulders* while saying *No*, with a *descending intonation. Head shake, shoulder shrugging* and the *intonation* and *voice quality* of *No* convey annoyance.
The boy *starts looking at other pieces* attentively, and she says: *E allora? Guarda un po'!* (and then? Look!) with *shared gaze at task* and a *smile* conveying tenderness).

The teacher exhibits annoyance as he puts a piece into the puzzle the wrong way, but also conveys she is being ironic in this, by smiling at the same time. Contradiction between parallel or subsequent signals is a typical way to communicate one's ironic intent (Attardo et al., 2003). Further, two kinds of irony exist (Anolli, 2003) benevolent and sarcastic irony; the former states negative evaluations but in fact implies positives ones, while the other does the opposite. The teacher's irony in this case conveys a positive stance, first because it is of the benevolent kind, second because irony typically elicits a positive emotion, amusement.

6. No judgment. This teacher, different from others in the corpus, does not take a checking or judging attitude, which reveals both a constructive didactic stance and an affective-relational friendly stance. For example, she expresses approval only when explicitly requested by the pupil.

(7) The boy is *putting pieces*. The teacher *looks at him* with a *smile* conveying serenity. He *looks at her* and asks her: *La banana va bene?* (Is the banana ok?).
The teacher says: *Hai capito* (You have understood), while *nodding* and *smiling*.

Moreover, she does not comment at all when the boy makes a mistake, but she communicate approval when he corrects his move by himself.

(8) The boy is *putting a piece* and she *looks at him* with a *light smile*. He sees the piece doesn't fit there. So he *takes another piece*, and *puts it there*. When seeing this, the teacher says *Sì* (Yes).

Finally, as shown above, she expresses her corrections only in ironical form.

7.3.3. Efficient stance.
The "efficient" teacher tend to be mainly oriented to the resolution of the task, usually in a repetitive and partial way, i.e., without considering the cognitive or metacognitive processes which might lead the pupil to a more active learning.
In our corpus, the task presented to the teacher-pupil dyad is a puzzle to be completed, so the teachers taking an efficient stance tend to indicate the right piece of puzzle or its position, to prevent the pupil's errors. The efficient stance is often taken due to an incorrect analysis of task difficulty or child's ability, caused by the teacher's anxiety, that induces her to prevent failure (D'Errico et al., 2011). In fact in this interactive mode, Teacher 2. often shows signs of anxiety.

(9) The pupil reads slowly but correctly. As soon as she has some hesitation, or the teacher herself is trying to find the solution on her own, or when she does't understand the task submitted by the experimenter, the teacher performs a *worried facial expression* and she asks twice *"Deve leggere?Dobbiamo leggere anche noi?"* (Should she read?

Should we read too?).

The pupil's capacity in this case is not really and well considered: in fact, she achieved the task autonomously even if with slow times.
The efficient stance is taken when the teacher does not leave time to start the process but is more concerned for the pupil to carry out a brilliant performance. In this case the pupil's slow times (waiting times for the teacher) or hesitations are seen not as part of the learning process but as a mistake to avoid.
Actually, this didactic stance generates a hierarchical relationship and therefore, at least in the interactions analyzed, teachers who take an efficient stance tend to assume a dominating or a paternalistic stance.

7.3.4. Dominating stance
In the dominance stance, verbal communication is often minimal, and when present, the most frequent speech acts are orders or statements about how to complete the task, actions generally aimed at task completion on the part of the teacher, and, at most, signs of approval like nods when the pupil inserts the piece in the right place, or signs of disagreement in the opposite case.
In addition, the dominating teacher looks generally distant and emotionally cold.

(10) As the game starts, the teacher does not interact with the child or with the Experimenter explaining the game at all. She sits down far from the game table, she looks downward, as if feeling she does not have a defined role.

(11) When the teacher is alone with the girl, she asks: *"Lo conosci? che cos'è? Un puzz..."* (Do you know him? What is it? A puzz...)
The girl replies: *Un puzzle* (a puzzle). And the teacher praises her: *Bravissima!* (Very good!)

The teacher's praising the girl in an exaggerated manner simply for her having recognized a puzzle as a puzzle implies her low evaluation of the girl's skills and knowledge, which might account for treating her in a very directive manner, as is clear below. In fact, most of her verbal statements are of an operational kind

(12) The teacher *approaches the girl* and says: *Allora prendi i pezzettini e prova a formare quello che c'è qui...* (so now take the pieces and try to shape what is here).
Later, the teacher says: *Metti il pezzo qui!* (put the piece here).

Gaze is very often not shared with the pupil.

(13) At first the teacher's *gaze is directed downward*, on the pieces to be inserted, as is the girl's gaze (then, a *shared gaze on task*); but then the child begins to take individual pieces, while the *teacher goes on ordering pieces* on the table (*nonshared gaze*).
At any time during her educational interaction she does not forget to regulate the girl's behavior even outside the learning task.

(14) As the child *coughs*, the teacher tells her: *Mettiti una mano davanti alla bocca* (put yourhand over your mouth).

(15) As the girl's left arm is down the table, along her hip,

the teacher *takes the child's arm* and *puts it on the table.*

Sometimes she even undoes what the girl has just done.

> (16) The pupil tries the pieces; the teacher *frowns*, thus showing doubt, then she *takes the piece inserted by the girl away* and *inserts it in a slot herself.*

> (17) The girl is putting a piece. The teacher says: *No, non così…* (no, not like that…). *Gaze* is *nonshared*: while the girl observes her action she continues to look for pieces separately.

Finally, she does not refrain from showing impatience, by frequent *sighs*.

The most evident features of a cold efficient stance in these fragments are: non-shared gaze, lack of any verbal exchange but orders like "put the piece here", or negative evaluations, and overtly manifested impatience about the mistakes made by the child.

7.3.5. Paternalistic stance

The Paternalistic stance differs from the Dominating stance for a different use of affective communication. When the unequal relationship of the Dominating stance becomes emotionally warm, it gives rise to a "paternalistic" stance, establishing an asymmetrical relationship between one who knows how to reach the solution and one who is to achieve it.

In teacher 3., a good example of this, the presence of emotion (sometimes resulting in a process of infatilization of the pupil) is expressed for instance by hugging the pupil during task completion, or by gestures of touch on the girl's nose or face. The teacher even simulates the pupil's emotion when she looks in doubt.

> (18) The girl is concentrating, and the teacher says: *Che fatica!* (How tiring!), even if pupil doesn't communicate anything similar.

7.3.6. "Secure base" stance

The "secure base" stance is the opposite of the paternalistic stance. We call it with the name given by Bowlby (1988) to the relation between mother and child in which a child with a secure attachment can explore the world just because s/he knows that mother is there in case s/he needs help. As does the mother in the secure condition of Ainsworth's (1969) Strange Situation, here the teacher is responsive to the pupil's requests, and supportive in stressful episodes. The relationship she establishes with the pupil is in some sense a peer relationship: she does not seem to teach or know something more than the child, nor does she feel the necessity to frequently encourage or express positive emotions, except after task completion, and does so only to share the success obtained thanks to the pupil's skill.

In our observation, Teacher 4, taking a "secure base" stance, communicates her presence primarily through attentive observation or through "actions of contour" (adjusting or turning the pieces of the puzzle, or providing encouragement), but she does not interfere with the child's action, and to his request for confirmation she nods or spurs him to continue. The "secure base" stance discloses an autonomous and equal relationship between pupil and teacher, and intervention only in case of need.

> (19) In a *low voice*, the teacher says: *Dai* (Come on!) and *pats him lightly on his back*. The *distance* of her bust from him is *medium*, not too close.
> The child begins to try and put pieces by himself, while the *teacher observes him*, sometimes carefully *moving her head slightly forward* to see him better. The teacher *smiles* and takes a *static position*.

> (20) The girl takes off and puts the pieces completely alone and the teacher *nods silently* as she sees the girl has been able to put the right piece.

> (21) The teacher *approaches her head silently* when the girl has a little difficulty in piece search.

> (22) Gaze is constantly *shared on the task*. The teacher *presses down a piece* entered by the child.

8.   Conclusions and future work

The study presented in this paper is but a first attempt to single out some pedagogical stances that teachers may take in interacting with their pupils. Our preliminary qualitative analysis shows that different stances can in fact be characterized in terms of specific expressive and communicative behaviors, namely type and number of speech acts and body communicative acts, among which gaze behavior, smile, distance, body and gaze parallelism, verbal and bodily mirroring.

The analysis of these signals and a better understanding of how teachers' stances affect teacher-pupil interaction and pupils' learning is of the utmost interest for both human teachers' training and the construction of Virtual Pedagogical Agents. From the point of view of educational and social sciences, describing these signals and their link to specific pedagogical stances might provide teachers with a higher power of self-reflection; for instance teachers videotaped during educational interaction, when having the chance of a video-feedback (D'Errico, 2009), that is, of observing themselves in interaction, may better check if their pedagogical stance was efficient to really help her pupil, and observe the pupil's reaction with new eyes.

In the domains of social signal processing and Virtual Agents, careful annotation of pedagogical stance signals might contribute to develop systems for the automatic detection of teachers' and pupils' signals, and to accurate simulation of teachers' behavior in view of more effective Pedagogical Agents.

With such aims in mind, our future work s will move from purely qualitative analysis of selected fragments to larger quantitative studies aiming at a more exhaustive typology of pedagogical stances, and possibly at finding correlations both between didactic and affective-relational stances, and between the stance taken and the factors hypothesized above – teacher's personality, conception of one's role, model of the pupil. Second, while here we only tackled the teacher's signals, since stance determines and is determined by the pupil's behavior, future research will analyze the

pupil's reaction to the stance taken. On the side of signal analysis, since low-level signals such as posture, position, parallelism and mirroring, in their often being automatic and unconscious signals reveal a teacher's stance more that words or actions do, research will usefully exploit, beside qualitative observation and analysis, detection through automatic systems devoted to capture aspects of distance, parallelism, synchronization and mimicry, such as, for instance, eyesweb (Camurri et al., 2004).

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10. References

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