

# Joint Commitment: An Analysis of Emotions and Non-Verbal Behaviors

**Francesca Morganti (francesca.morganti@unibg.it)**

Dipartimento di Scienze Umane e Sociali, University of Bergamo, 2 Piazzale S. Agostino,  
Bergamo, 24129 Italy

**Antonella Carassa (antonella.carassa@usi.ch)**

Faculty of Communication Sciences, University of Lugano, 13 Via Giuseppe Buffi,  
Lugano, 6904 Switzerland

**Marco Colombetti (marco.colombetti@usi.ch)**

Faculty of Communication Sciences, University of Lugano, 13 Via Giuseppe Buffi,  
Lugano, 6904 Switzerland

DEIB, Politecnico di Milano, 32 Piazza Leonardo da Vinci,  
Milano, 20135 Italy

**Paride Braibanti (paride.braibanti@unibg.it)**

Dipartimento di Scienze Umane e Sociali, University of Bergamo, 2 Piazzale S. Agostino,  
Bergamo, 24129 Italy

**Giorgio Rezzonico (giorgio.rezzonico@unimib.it)**

Dipartimento di Scienze della Salute, Università di Milano-Bicocca, Piazza dell'Ateneo Nuovo, 1  
Milano, 20126 Italy

**Ivana Sgro (ivana.sgro@studenti.unibg.it)**

Dipartimento di Scienze Umane e Sociali, University of Bergamo, 2 Piazzale S. Agostino,  
Bergamo, 24129 Italy

## Abstract

According to Margaret Gilbert, a joint commitment (JC) is a commitment of two or more agents, called the parties of the JC, to engage in a common project. Creating a JC often involves an explicit agreement, carried out in a conversational interaction through overt communication. We explored aspects of such interactions that can be considered as complementary to verbal exchanges, focusing on how a JC is managed by the parties by means of emotional and other non-verbal bodily expressions. We analyzed three phases of the JC lifecycle (creation, maintenance, and violation), and in particular the emotional reaction of the participants to two types of violations by the experimenter. In our analysis we used standardized tools such as the Ethological Coding System for Interviews, the Mind Reading Emotional Library, and the Facial Action Coding System. Our results show that certain non-verbal behaviors in the phase of JC creation are characteristic of the participants who later did not fulfill their commitment. Moreover, the participants' emotional reactions to JC violation by the experimenter turned out to depend on the type of violation. Finally, the creation and maintenance of JC, and the emotional reaction to its violation, appear to be independent of the participants' personality and empathic disposition.

## Introduction

The theoretical background of this paper is Gilbert's plural subject theory (Gilbert, 1989) together with some developments by Carassa, Colombetti & Morganti (2008). Accord-

ing to Gilbert, all genuinely collective phenomena (like joint activities, collective beliefs, group feelings, etc.) involve a special kind of commitment, namely, a *joint commitment* (JC). An agent may be personally committed to do something as a result of an individual decision; in this case the agent is the only 'owner' of the commitment, and can rescind it as he or she pleases. Contrary to personal commitments, a joint commitment is a commitment of two or more agents, called the *parties* of the JC, to engage in a common project.

The main feature of JC is that it consists of normative relationships between the parties. If two parties are jointly committed to do something, then each one is obligated to the other one to do their part, and has the right that the other one do their part. Accordingly, a JC is violated when a party does not live up to their obligations.

Gilbert often remarks that making a JC does not necessarily require an explicit agreement: certain subjects may enter a joint commitment by starting to interact in certain ways, without ever trying to describe what they do together as a matter of agreement. Making explicit agreements, on the other hand, is very common in everyday life, and in the current paper we concentrate on this type of situation. According to Carassa & Colombetti (2009), explicit agreements to joint projects are typically created in a conversational interaction through overt communication, where an agent perform speech acts with a communicative intention, in the

Gricean sense (Grice, 1957), as in the following example: “Can you help me with my homework assignment?” “Yes, sure”. Beyond this plain example, it would be undoubtedly interesting to investigate how the making of agreements naturally unfolds in conversations, but our present research is aimed at exploring other complementary aspects of an ongoing face-to-face social interaction of this type. In fact, we want to take into account the role played by intersubjectivity, understood as the broad range of processes and capacities that, according to the enactive approach, allow one to directly perceive, understand and respond to the psychological states of others, without explicitly representing and reasoning upon them (Morganti, Carassa & Riva, 2008). We believe that such pre-reflective processes need to be investigated to get a comprehensive view of JC creation, maintenance and fulfillment/violation. This means that beyond studying the situated use of language in interaction, we also have to focus on non-verbal behaviors such as facial expressions, gestures, and bodily postures and movements that can be pre-reflectively produced and understood by the interactants. As an example, an interactant can be aware that an agreement has been made verbally, while at the same time perceiving that the other party is not really willing to live up to it. These kinds of behaviors we expect to shape the normative landscape developed by the interactants along emotional and tacit dimensions. In the present research we did not yet analyze, as an enactive approach would require, the participant-experimenter interaction, but we specifically focused on the participant non-verbal behaviors, considering them as components of intersubjective patterns to be further investigated.

The experiment reported in this paper addresses all phases of JC lifecycle: its creation, its maintenance by a participant, and a participant’s reaction to a violation performed by the experimenter in two different conditions. To understand if there is a personal predisposition to the acceptance and maintenance of a JC, we made an assessment of personality and of empathic disposition of the participants. This evaluation was justified by the hypothesis that personal predispositions could influence both the acceptance, maintenance and fulfillment/violation of a JC (this hypothesis, however, was not confirmed by our results).

## Materials and methods

### Subjects

The experiment involved 35 female participants, all of them students at the University of Bergamo, aged 19-27 ( $M = 21.11$ ,  $sd = 1.9$ ).

The sampling was conducted partially at random and the recruitment was voluntary. The experimental phase lasted three weeks between September and November 2011; data analysis was then conducted in a unique solution.

## Materials

**Personality and empathy assessment** To analyze the participants’ personality, their emphatic disposition and the potential connections with JC creation, maintenance and violation, some questionnaires were distributed. For personality assessment, we used

- a) the Eysenck Personality Inventory – EPI (Eysenck, 1985), composed by three sub-scales (extroversion/introversion, neurosis, psychosis); and
- b) the Mini Questionnaire on Personality Organizations – MQOP (Nardi et al., 2012), composed by four sub-scales (contextualized, normative, controlling, detached).

The latter questionnaire allows one to study personality as a process, by focusing on the relationships between personality and developmental process axes, based on Guidano’s theory of Personal Meaning Organization (1987).

Concerning the evaluation of emphatic disposition, two tools have been used:

- a) the Interpersonal Reactivity Index – IRI (Davis, 1980, 1983), according to which empathy results from the integration of four factors (fantasy-empathy, perspective taking, empathic concern, personal distress);
- b) the Emotional Regulation Questionnaire – ERQ (Gross & John, 2003), aimed at identifying the strategy of emotional regulation used by the subjects (cognitive reappraisal, expressive suppression).

**Joint commitment lifecycle** To evaluate the lifecycle of JCs, we used four parallel forms of self-evaluation diaries, based on the structured diary proposed by Oatley and Laroque (1994). The purpose of such diaries was to analyze different possible JC situations, in which the participants could find themselves during the experiment. The diaries proposed to the participants followed the Experiencing Sample Method of Larson and Csikszentmihalyi (1983), which requires participants to describe their experience at certain moments of time.

**Non-verbal behaviors** We used the coding system proposed by Troisi (1999) to analyze the non-verbal behavior of the participants during the face-to-face meetings in which the JC was created and managed. This method is known as the Ethological Coding System for Interviews – ECSI, and includes 37 behavioral patterns, most of them regarding facial expressions and hand movements.

To analyze the participants’ reaction to the JC violation performed in the second face-to-face meeting, we used the Facial Action Coding System (FACS) of Ekman and Friesen (Ekman, 1978). We also used the Mind Reading Emotional Library (Baron-Cohen, 2003, 2004) for the classification of the expressions of emotional reaction to JC violation.

## Procedure

Firstly the questionnaires about personality and empathic disposition were filled in by the participants. This self-assessment, carried out in a quiet room, required about 30 minutes for each participant. Then other three sessions followed:

1. an initial face-to-face meeting between the experimenter and the participant, in which the experimenter purported to describe the goal of the research (see below), the participant's willingness to take part in the research was ascertained, and a JC of the participant and the experimenter was made through an explicit agreement;
2. a one-week period in which the agreed activity was performed and monitored;
3. a second face-to-face meeting in which the JC was violated by the experimenter.

Both meetings were video-recorded by three hidden video cameras, one focused on the experimenter's face, the second on the participant's face, and the third on the body and face of both of them. During the first meeting, all the participants verbally expressed their willingness to participate in the research, and the second meeting was scheduled.

With every participant, the first meeting was divided into three sections:

1. The first section concerned the *description* of the research. The experimenter told the participant that the research was aimed to analyze the everyday life emotions experienced while performing joint activities with others. In details, she asked the participant to answer some diaries. Every day of the following week, each participant would receive by email 5 diaries per day (for a total of 35 diaries). Furthermore, the experimenter informed the participants that they had to hold a second meeting after one week, in which they would receive comments on their diaries, previously analyzed by the experimenter.
2. The second section consisted in the explicit *request* to take up the JC, performed by the question "So, do we agree?"
3. The third section consisted in the participant's *acceptance* of the JC (in fact, no participant refused to take up the JC).

In the week between the first and the second meeting, the 35 diaries were sent to the participants by email, thus living up to the experimenter's obligations deriving from the JC. The explicit purpose of this experimental phase was to collect data about the personal feelings related to different kinds of commitments experienced by the participants during the day. Moreover, the participants had been informed that in this phase the experimenter would have monitored their answers, in order to provide the participants, during the second meeting, with a complete evaluation of their personal 'style of commitment.'

Of the 35 participants (all of whom explicitly agreed to carry out the research), 21 came to the second meeting, which was structured in two sections as follows:

1. In the first part, the *maintenance section*, the 21 participants, that expected to receive comments on their answers, were asked about their experience during the previous week.
2. In the second part, the *violation section*, the experimenter told the participants that their diaries had not been examined, thus making all their work useless. The violation of the JC was attributed to two different motivations:
  - a. to 11 of the 21 participants, the experimenter said that she changed her mind and that she no longer wanted to complete the experiment (we call this the *internal attribution* of the violation);
  - b. to the other 10 participants, the experimenter said that it was impossible to complete the experiment, due to the fact that the university refused to approve her project (we call this the *external attribution* of the violation).

The reaction of the participants to the JC violation was recorded for further analysis. At the end of the meeting the actual design of the experiment was revealed to the participants.

## Data coding

The non-verbal behaviors displayed in the two meetings were analyzed using the ECSI method. The entire duration of the video-recorded meeting was therefore analyzed by identifying, for each participant, the occurrences of the 37 behavior patterns specified by Troisi (1999).

To monitor the lifecycle of the JC, we examined the participants' answers to the self-evaluation diaries. For each participant, the 35 diaries were coded according to the methodology described by Grazzani-Gavazzi and Oatley (1999). In order to better adapt this methodology to the specific purpose of our research, the items regarding the participants' private emotions during the management of the JC and those attributed by the participant to other people (item 7 and 8) have been coded according to the Mind Reading Emotional Library, and not according to Johnson-Laird's classification as in the original methodology.

In the second meeting, the analysis of the non-verbal reaction to the violation of the joint commitment was conducted using the Action Unit analysis of FACS. We scored the Action Units of the participants occurring in the 30 seconds following the experimenter's violation. Moreover, two independent judges, experts in psychotherapy, were asked to identify the prevalent emotion displayed by each participant as a reaction to the JC violation, and to classify it according to the Mind Reading Emotional Library. The two judges were showed the video-recordings of participants' emotional reaction to the JC violation, but were not explained the situation in which the participants were involved; the

question they were asked was, “These people were told an unexpected piece of news: what kind of emotional reaction are they showing?”

## Results

To understand which factors may be predictive of the participants’ fulfillment of the JC two groups were defined, respectively including the 21 participants who came back to the second meeting (Returned - R), and the 14 participants who did not come back (Not Returned - NR).

We first analyzed the questionnaires regarding personality (EPI, MQOP) and empathic disposition (IRI, ERQ), to understand whether we could identify a predisposition to maintain the JC. Comparing the questionnaire answers obtained by the R and the NR groups, no significant difference was found.

We then considered the number of occurrences of the 37 ECSI behavior patterns in the different sections of the first meeting. While the comparison between the two groups did not show any significant difference in the ECSI behavior patterns during the description and acceptance sections, in the request section we found significant differences between the groups, concerning 10 of the 37 behavior patterns (see Table 1).

To analyze the lifecycle of the JC, we examined the 408 self-evaluation diaries that were returned by the 21 participants who came to the second meeting. Every participant answered on the average 19.42 diaries (sd = 9.31) of the 35 received during the week. The answers to the diaries did not contain any important information on the participants’ emotions concerning JCs in their everyday life.

In any case, we used the diaries as a marker of the participants’ commitment, dividing the participants into two groups:  $\geq 25$  answered diaries,  $< 25$  answered diaries. In fact, no significant difference between these two groups was observed in the ECSI behaviors exhibited during the first meeting.

Table 1: ECSI behavior patterns at the first meeting: significant differences between the R and NR groups (*t*-test for independent samples).

Pattern	p
4. <i>Flash</i>	$p < .046$
6. <i>Smile</i>	$p < .003$
9. <i>Mouth corners back</i>	$p < .009$
12. <i>Shut</i>	$p < .003$
16. <i>Shake</i>	$p < .003$
23. <i>Gesture</i>	$p < .001$
29. <i>Fumble</i>	$p < .014$
33. <i>Relax</i>	$p < .015$
34. <i>Settle</i>	$p < .004$
37. <i>Neutral face</i>	$p < .008$

However, we found a significant difference between the two groups in the violation section, where certain behaviors occurred significantly more often in the  $< 25$  group (4. *Flash*,  $p < .027$ ; 15. *Still*,  $p < .003$ ; *t*-test for independent samples).

As for the second meeting, we first compared the ECSI behaviors in the maintenance and violation sections, for all the 21 participants who came back (R group). No significant difference was found. For the violation section we conducted a further analysis of ECSI patterns, which revealed significant differences in certain behaviors between the internal and the external attribution groups, as shown in Table 2.

The emotional reactions observed after violation were analyzed using the Mind Reading Emotional Library. The index of agreement between the two judges was evaluated as Cohen’s  $\kappa = .79$ . The distribution of emotions according to the two types of violation is summarized in Table 3.

Table 2: Significantly different ECSI patterns in the second meeting (*t*-test for independent samples).

Behavior patterns whose mean is significantly higher in the internal attribution group	
Pattern	p
2. <i>Head to side</i>	$p < .020$
3. <i>Bob</i>	$p < .035$
10. <i>Look away</i>	$p < .010$
14. <i>Crouch</i>	$p < .001$
18. <i>Lean forward</i>	$p < .001$
24. <i>Groom</i>	$p < .013$
36. <i>Laugh</i>	$p < .010$
Behavior patterns whose mean is significantly higher in the external attribution group	
Pattern	p
12. <i>Shut</i>	$p < .029$
13. <i>Chin</i>	$p < .039$

Table 3: Distribution of emotions according to the two types of violation.

Emotion	Internal attribution	External attribution
<i>Sad</i>	1	4
<i>Hurt</i>	0	4
<i>Angry</i>	3	1
<i>Unfriendly</i>	3	1
<i>Surprised</i>	0	1
<i>Disbelieving</i>	1	0
<i>Bored</i>	1	0

Table 4: Emotions according to FACS and Mind Reading (action units in parentheses, partial agreements in italics)

Upper Face Decoding	Lower Face Decoding	Mind Reading
<i>Surprise (1+2+5)</i>	<i>Anger (4+5+23)</i>	<i>Unfriendly</i>
<i>Surprise (2+5)</i>	<i>Disgust+Anger (9+10)</i>	<i>Hurt</i>
<i>Anger (7)</i>	<i>Disgust (9)</i>	<i>Unfriendly</i>
Surprise (1+2+5)	Surprise (26)	Sad
<i>Surprise (1+2+5)</i>	<i>Anger(23)</i>	<i>Unfriendly</i>
Surprise (1+2+5)	Anger (23)	Sad
Surprise (1+2+5)	Anger (23)	Bored
Surprise (1+2+5)	Sadness (17)	Angry
Surprise (1+2+5)	Sadness (17)	Disbelieving
Surprise (2+5)	Anger (23)	Sad
Surprise (1+2+5)	Sadness (17)	Angry
<i>Surprise (2+5)</i>	<i>Anger (23)</i>	<i>Unfriendly</i>
–	<i>Anger (23)</i>	<i>Unfriendly</i>
Surprise (1+2+5)	Anger (23)	Surprised
–	Sadness (17)	Angry
<i>Sadness (1+4+7)</i>	<i>Anger (23)</i>	<i>Angry</i>
Surprise (2+5)	Anger (23)	Sad
<i>Sadness (1+4+7)</i>	<i>Sadness (15+17)</i>	<i>Sad</i>
Sadness (1+4+7)	Disgust+Sadness (9+17)	Angry
<i>Anger (4+5)</i>	<i>Sadness (17)</i>	<i>Hurt</i>
<i>Anger (4+5)</i>	<i>Anger (23)</i>	<i>Hurt</i>

Excluding the neutral ones (i.e., surprised, disbelieving, and bored) these emotions were classified in two groups: sad and hurt as *self-centered emotions*, angry and unfriendly as *other-centered emotions*. The comparison between these two groups of emotions revealed a significant difference between the two types of violation ( $\chi^2$  test with Yates's correction,  $\chi^2 = 4.743$ ,  $p < .03$ ), where the self-centered emotions were predominant in the external attribution group, and the other-centered emotions were predominant in the internal attribution group.

The analysis of Action Units, carried out through FACS and decoded into primary emotional expressions, partially agreed with the Mind Reading analysis, as shown in Table 4. Finally, the emotional reaction to the violation of JC was statistically related neither with personality nor with empathic disposition.

## Discussion

Our results do not show any effect of the participants' characteristics, such as personality and empathic disposition, on the disposition to maintain or violate a JC. Instead, our data indicate that certain non-verbal behaviors carry relevant information on the subjects' attitude toward the JC they are currently creating. In fact, we observed that some non-verbal behaviors displayed in the first meeting are significantly different between the NR and the R group. It would be interesting to understand whether these behaviors are

voluntary attempts to hide a lack of interest in the joint project (irrespective of the verbal acceptance of the JC), or pre-reflective bodily expressions of uncertainty about the decision of taking part in the project. In the latter case, the recurring behavioral patterns in the participants who did not come to the second meeting may indicate a feeling of uneasiness concerning the situation they are currently experiencing.

Regarding the lifecycle of the JC, the analysis of the diaries did not yield any important indication on how the commitment was experienced during the week between the two meetings. The average number of diaries answered by the participants who came to the second meeting (19.42 out of 35, i.e., 55.5%) was rather low, which suggests that even those participants who at least partially fulfilled the JC regarded coming to the second meeting as more important than completing the assignments. The only significant behavioral difference that we found between the  $\geq 25$  and the  $< 25$  answered diaries groups occurred during the violation section of the second meeting, where we observed that two non-verbal behaviors (i.e., *Flash* and *Still*) were performed more frequently by those who answered less than 25 diaries.

Regarding JC violation, the personality and empathic disposition of the participants did not seem to affect their emotional reaction. On the contrary, the two types of violation (internal vs. external attribution) significantly affected the reactions in the participants, as highlighted by both the behavioral occurrences observed through the ECSI method and the emotional reactions detected by the two judges. Whether such differences were under voluntary control or pertained to the sphere of pre-reflective reactions cannot be established on the basis of our current experimental design.

More specifically, as far as emotions are concerned the Mind Reading analysis carried out by the two judges highlighted two different reactions:

1. In the case of violation with external attribution the most frequent emotions were "sad" and "hurt," which can be regarded as self-centered emotions. This is probably due to the fact that the participants, while feeling frustrated because their work turned out to be useless, were willing to consider the experimenter's violation as excused by the university's refusal to approve the project.
2. In the case of violation with internal attribution, the most frequently observed emotions were "angry" and "unfriendly," which can be regarded as other-centered, as they are directed to another subject. These emotions plausibly reveal a feeling of resentment toward the experimenter, who is considered as fully responsible for the violation of the JC.

We believe that these results may be explained by taking into account the normative structure of JCs, and in particu-

lar their second-person nature (Darwall, 2006) and their relationships with so-called reactive attitudes (Strawson, 1962). Investigating these aspects of interpersonal normativity is among our future research goals.

Finally, the comparison of the emotions coded through Mind Reading and those coded through FACS only showed partial agreement (for 10 on 21 participants). The reason for this partial agreement may be connected with the different focus of analysis these tools are based on; in fact, whereas FACS focuses on facial micro-expressions that pre-reflectively arise before a social mediation of the emotion, the Mind Reading coding system also takes social emotions into account.

To conclude, our results allow us to identify some non-verbal behaviors as typical of the participants who, even if they verbally agreed to create a JC, did not fulfill the corresponding obligations. Moreover, our experiment suggests that the type of violation attribution (internal vs. external) is the most significant factor in shaping the reactive emotions, overshadowing the effect of personality and empathic disposition.

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