Computer-mediated communication and persuasion: Peripheral vs. central route to opinion shift

Paola Di Blasio *, Luca Milani

Center for Research in Educational Technologies, CRTI – Catholic University of Milan, Italy
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Abstract

Objective of this research was to investigate the differences between face-to-face communication and computer-mediated communication regarding opinion change in small group decision-making. We hypothesized that people in a discussion through computer-mediated communication accede to cognitive processes that could facilitate resisting the effects of a persuasive message.

Participants were 108 degree students with a mean age of 21.5 (range 19–26): 51 males (mean age = 21.5) and 57 females (mean age = 21.4).

Subjects had to discuss in a small group (three to five people) an issue given by the experimenter related to a fictitious reorganization of the university refectory. Subjects were randomly assigned to two experimental conditions: face-to-face small group discussion and computer-mediated (chat) small group discussion. At the half-way point in the discussion the experimenter introduced a new piece of information supplied by an influential source. The piece of information was in contrast to the prevailing opinion in the group. Results show that there were fewer opinion changes in the chat condition (subsequent to the introduction of the persuasive message) than in the face-to-face condition.

According to Petty and Cacioppo’s Elaboration Likelihood Model (1986), we argue that discussion via computer could possibly activate the central route more easily than discussion face to face.

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1. Introduction

It is well known that the "digital revolution" has profoundly changed the usual modes of communicating. The possibilities offered by the computer and by digitalization have, in fact, made communication at a distance simpler, faster and economically accessible, and have increased the number of potentially reachable interlocutors.

One of the themes that the literature has examined concerns the formal differences between traditional face-to-face communication and communication via computer (for a review cf. McKenna & Bargh, 2000), above all the impact that the use of computer-mediated communication (CMC) has on an individual and group level.

Moreover, also the persuasive influence that computer-mediated communication could exert assumes a particular interest, owing to the multiplication of information sources present online, sources of which sometimes it is not possible to determine the effective credibility (Flanagin & Metzger, 2000). It therefore appears to be of some interest, and it is the purpose of this research, to try to understand better what differences exist between face-to-face communication and that mediated by the computer in the elaboration of a message with persuasive features. After a brief summary of the main contributions which have emerged in the context of studies on computer-mediated communication and persuasive communication, we will present the organization and results of the research.

1.1. Computer-mediated communication

The computer is a communication device which includes particular features which are different from those which typically characterize face-to-face communication: it in fact involves a communication which is non-present, asynchronous and useable by many to communicate with many. Although the first "cues filtered out" approaches (Hiltz, Johnson, & Turoff, 1986; Sproull & Kiesler, 1986) highlighted some negative aspects of communication via computer, which was substantially judged to be an impoverished version of face-to-face communication, later positions assumed by scholars have been orientated towards the study of the specificity of the two systems of communication.

Towards the end of the eighties, two principal lines of research emerged which investigated the meaning of computer communication: the Social Identity/Deindividuation perspective (SIDE) (Spears & Lea, 1992) and the Social Information Processing perspective (Walther, 1992).

The SIDE contributed to making it clear that the perception of belonging to a social group, even a virtual one, in some way orients and restricts the way in which both one’s interlocutors and oneself are perceived. Owing to the lack of clear clues about the identity and personality of the interlocutor, participants in interactions via computer find themselves in a situation of anonymity and thus tend to attribute greater relevance to the remaining perceivable characteristics, particularly those that define social group. According to Spears and Lea (1992), precisely the main factors traditionally considered responsible for the process of de-individualization, namely the combination of anonymity and immersion in a group, in reality can reinforce support and conformity to the norms of the group. In fact, during communication via computer the positions within the group tend to conformity and to be aggregated around polarised positions (Spears, Lea, & Lee, 1990); and group norms are generated (Postmes, Spears, & Lea, 2000), whose constitution is determined precisely by the condition of anonymity (Postmes, Spears, Sakhel, &...
de Groot, 2001). It also emerges that communication via computer can assume the function of a medium which favours social support in minority groups (Spears, Lea, Cornelussen, Postmes, & Haar, 2002).

In these same years, the hypothesis of “Social Information Processing” (SIP), proposed by Walther (1992), supplied elements which are useful for understanding how people, using the few social indices available in communication via computer, succeed in building an impression of the people with whom they are interacting. In this perspective, the main difference between communicating face to face and via the computer is the speed with which in face-to-face communication people build quite detailed impressions of their interlocutors. On the contrary, in communication via computer these impressions need more time to form although, generally, after repeated interactions, they appear to be equally well formed (Walther, 1993). The creation of interpersonal bonds between CMC interaction partners can be explained on the basis of the adoption of anticipation mechanisms, whose importance has been further verified (Walther, 1994). These are interactive modes characterized by the active search for more information about one’s interlocutors, by a friendlier and more favourable attitude and by communicative strategies marked by positive emotions.

When, therefore, these interactions via computer are prolonged in time, one meets a level of intimacy higher than that of face-to-face communication and the phenomenon of “hyperpersonal communication” is generated, by which is meant the propensity to emphasise the positive or socially desirable characteristics of the people with whom one interacts (Walther, 1996).

From these approaches derives a conception of computer-mediated communication which, on the one hand, “forces” those who use it to adopt interactive modes determined by the group and, on the other, also allows them to transmit deep and hyper-invested emotional values, above all when the interactions are prolonged in time. Overall, however, in spite of the constant increase in the breadth of the “band” of online communication (which would allow us theoretically to add audio and video to computer mediated communication and to widen the sensory channels beyond the single usual interaction through text), CMC largely remains, as Walther recognizes (1996, p. 10), a restricted and rarefied communication system compared to face-to-face communication, both because of lack of non-verbal cues and slowness due to the typing of text messages on a keyboard.

These two lines of research can be considered compatible (cf. Hancock & Dunham, 2001): the SIDE proposal describes group interaction and the modes of creation and sharing of norms of conduct and of group membership in communication via computer, while the SIP perspective concentrates more on interpersonal perception and on the relational quality of CMC.

Besides producing the three interactive interpretative approaches treated to this point, research has concentrated also on other aspects of computer/mediated communication, particularly on the “real” applications of CMC, outside laboratories. Thus the main problems associated with a problematic use of communication via Internet have been investigated (Caplan, 2003; Joinson, 2004), the analysis of the interpersonal aspects of online communication (Baym, Zhang, & Lin, 2004; Beuchot & Bullen, 2005; Dietz-Uhler, Bishop-Clark, & Howard, 2005), the study of processes of collaboration online (Becker-Beck, Wintermantel, & Borg, 2005; Fjermestad, 2004), virtual teams (Martins, Gilson, & Maynard, 2004), and of methods of cooperative learning (Francescato et al., 2006; Kirkpatrick, 2005; Van der Meijden & Veenman, 2005).
In spite of the new openings, research in the context of CMC has not yet been able to make completely clear the differences between communicating face to face and communicating via the computer, above all regarding social influence and persuasion. For example, it has not been made clear – as we shall see better in the following paragraph – what influence communicating via the computer has on interpersonal persuasion, whether for example the computer represents a kind of barrier which does not permit persuasive messages to act on their targets, or whether, on the contrary, there is an amplification of these effects, lending greater credibility to messages.

1.2. Social influence, computer-mediated persuasion

In general terms (cf. O’Keefe, 2002), “persuasion” is an activity in which a source tries to intentionally influence a receiver and with the purpose of reaching a given objective: modifying opinions, attitudes and behaviours of the “target”.

The definitions of persuasion, a fluid concept with unclear limits, are not univocal. Sometimes the accent is placed on communicative aspects (Andersen, 1971; Bettinghaus & Cody, 1987), sometimes on cognitive aspects (Smith, 1982), and sometimes on intentionality (O’Keefe, 2002).

Perloff (2003) summarises the contribution of the various approaches by defining persuasion as: “[…] a symbolic process in which communicators try to convince other people to change their attitudes or behavior regarding an issue through the transmission of a message, in an atmosphere of free choice.” (Ibid, p. 8). In a general sense, there is no doubt that communication represents the key aspect of the persuasion process and, in fact, “[…] paradigm cases of persuasion are ones in which the effects are achieved through communication (and perhaps especially through the medium of language).” (O’Keefe, 2002, p. 4).

However, there are decidedly few studies which have analysed these aspects in the context of communication via computer (cf. Guadagno & Cialdini, 2005; Wilson, 2003), above all if they are compared with those carried out in the context of face-to-face communication.

Research carried out after the Second World War demonstrated how in face-to-face communication social influence plays a fundamental role in determining people’s behaviours and opinions. Asch (1952, 1956) verified by a now-famous experiment how the influence of the group is very important in determining the conformity of the individual to the dominant position, even when this proves to be obviously wrong. In Asch’s studies (Ibid) the subjects – artificially placed in a minority position in a small group which had the task of judging the length of a line – in 76% of the cases conformed to the reply supplied by the majority even if this was clearly wrong.

Persuasive influence is not only manifested arising from a difference with a majority but also from figures or individuals perceived as an authority. In this case Milgram (1974) showed how people, in order to obey an authoritative person, behave in a way against their convictions and evidently harmful. The experiment foresaw that the subject of the experiment should take on the role of “teacher” in a fictitious “memory task”, training a false “learner” with heart problems to repeat certain vowels, and giving electric shocks (imaginary, but not for the subject) for every error of the learner; 63% of the subjects even succeeded in giving the entire series of electric shocks foreseen by the protocol, even reaching the potentially lethal 450 volts.
As Moscovici and Lage (1976) show, not only the majority or authority exercise the power to influence the individual, but also the minority may encourage a person to change opinion. Moscovici, Lage, and Naffrechoux (1969) in fact demonstrated how a minority can influence and convert a majority in relation to a task of judging the colours of objects and cause some subjects to give erroneous answers on the colour of some slides. Nemeth (1986) in this connection observes that while the majority would promote a process of cognitive convergence (individuals would consider the problem from the same point of view as the majority), the minority influence stimulates cognitive divergence: to consider the problem not from only one point of view, but in many perspectives.

To speak more specifically about the comparison between computer-mediated and face-to-face communication, the research conducted to verify whether the change of opinion – measured through the comparison between the position assumed on a certain subject at the end of the discussion and the individual opinions recorded before the discussion – was quantitatively different for face-to-face and computer-mediated discussion groups has not shown univocal results. Some authors (Kiesler, Siegel, & McGuire, 1984; Siegel, Dubrovsky, Kiesler, & McGuire, 1986) have found that the groups conducted via computer show a greater opinion shift between the beginning of the discussion and the end, while others, on the contrary have not found this phenomenon (Dubrovsky, Kiesler, & Sethna, 1991; Hiltz, Turoff, & Johnson, 1989).

One of the few studies specifically oriented towards discovering the difference between the two modes of communication in relation to the phenomenon of social influence is that by (Smilowitz, Compton, & Flint, 1988). Adapting Asch’s methodology to interaction with the computer, the authors demonstrated how those who used the computer were better able to resist pressure created by the majority than those who communicated face to face (Smilowitz et al., 1988).

As Wilson (2003) observes, communication via computer is intrinsically less suitable for persuading one to change one’s opinions, both because of deficiencies in the communication setting concerning the possibility to transmit non-verbal cues and limitations in the range of utilizable strategies. In a research study (Wilson, ibid) with university students intended to compare the level of perceived effectiveness of persuasive face-to-face and computer-mediated communication (in this case asynchronous, since e-mail was used), it emerged how communication via computer can be considered less suitable for persuasion than face-to-face communication because of the inferiority of its perceived effectiveness, that is the persuasion potential of the medium attributed to it by the subjects of the experiment, through the evaluation questionnaire.

Not only the subjective perception, but the effective persuasion potential of e-mail interaction compared to face-to-face interaction, appear less significant. Guadagno and Cialdini (2002) compared face-to-face and e-mail discussions to verify both the force of arguments and differences of gender. The dyadic discussions on which this research is based were carried out in such a way that one of the partners, trained by the researcher, could exert an active pressure directed at conditioning his interlocutor’s decision. The results, besides demonstrating that strong arguments were successful in convincing the subjects of different opinions, showed how communication via computer has a much weaker persuasion effect than that face-to-face communication. In particular, the female participants, but not the male ones, yielded less to their interlocutor’s pressure when he/she imposed a change of opinion in the session via e-mail than those in the face-to-face
discussion: a further confirmation, therefore, that communication via computer limits the effects of attempts at persuasion.

From these first results it emerges that at least two elements contribute to determining the possibility or impossibility of changing opinions. On the one hand, the strength of arguments, which certainly has a considerable importance in convincing subjects to embrace positions different from their own; on the other the communication channel, that is the means by which the message is conveyed. In this connection, computer-mediated communication seems less suitable for changing opinions compared to face to face communication, and from a certain point of view could represent a filter which protects from persuasion. In fact, it is precisely the differences between the two channels of communication which in our opinion deserve particular attention.

The situations of an individual in a face-to-face discussion group and the one who interacts in an online discussion are certainly very different. Although both must adjust, in real time, their judgements and interventions to the interventions of others, those who discuss face to face are able both to use the auditory channel and to observe non-verbal signals through the visual channel. On the contrary, those who interact online do not receive non-verbal signals and process information through the visual channel of reading with a slower tempo that allows them better to consider the positions of others. It can thus be hypothesized that those who participate in an online discussion can reflect better on the content of the messages and can effect complex cognitive operations of evaluation of content, without the interference of non-verbal signals.

These considerations seemed to us to be compatible with those contained in Petty and Cacioppo’s Elaboration Likelihood Model (1986), in which it is hypothesised that the variations in the result of the process of persuasion are a function of the way in which the information is elaborated. In some circumstances individuals base their evaluations on a very careful process of reasoning, paying attention to every single item of information and reflecting on important questions; in others they tend not to activate the same resources and use more automatic thought processes.

Persuasion may act on both the cases (Petty & Cacioppo, ibid), but following different routes. The first called, central persuasion route, presupposes the use of careful processes of reasoning and would be activated when people are highly motivated (for example, because they consider the subject interesting) and when the arguments proposed are convincing. Any factor which reduces the efficacy of the process of message elaboration (e.g. a distraction) would limit the possibility of an elaboration via the central route.

On the contrary, the second, called peripheral route, would be used when the stimulus of the message to cognitive elaboration is minimal, or when the subject cannot dedicate due attention to it: in these cases other factors would become relevant, factors not linked to the message in itself but rather to the characteristics of the source (level of experience of attractiveness/likeability) or of the context.

To summarise, individuals would tend to behave in a “central” way when the content of the message is important, when they are motivated and when they are able to employ adequate cognitive resources (absence of distracting factors and presence of adequate knowledge of the subject), while they would use the “peripheral” route in other situations. If, therefore, an individual, for personal reasons or because of the weakness of information channels is not able to activate the level of central elaboration, he could more easily be the object of persuasion.
1.3. Objectives of the research

If we use Petty and Cacioppo’s conceptual model (1986) to reconsider the differences between group face-to-face communication and communication via computer, it seems plausible to us to hypothesise that the use of online communication has greater potential for allowing the access to the central path of information elaboration, while face-to-face communication, because of the simultaneous presence of verbal and non-verbal signals creates a greater density of interaction which favours processes of distraction. It is therefore probable that – faced with the same persuasive or conditioning message – people who discuss questions online are less disposed to be conditioned, since they have more time to elaborate information and can activate central cognitive processes of a higher quality.

To verify whether the different context of a group discussion (face-to-face discussion vs. online discussion) influences the process of change of opinion, we have performed this research. The question arose whether unexpected or ambiguous information, that is information “open” to various interpretations, comes from a very influential and authoritative source, produces different conditioning effects in orienting the final decision in the two different conditions of face-to-face discussions and online discussions.

In evaluating the change of opinion we considered two indicators: the first composed of the number of opinion changes following the introduction of a conditioning message and the second represented by the extent of the opinion change. The simple number of opinion changes, in fact, did not seem to us to be a sufficient indicator, also in the light of the indications of Erwin (2001) and O’Keefe (2002), who underlined that to represent accurately opinion change it is opportune to measure also the intensity of the attitude, through an appropriate evaluation scale. For this reason, we also managed the extent of the opinion change, to permit us not only to verify whether there has been a change of opinion, but also its dimensions.

In the context of the above objectives we can thus briefly specify two interconnected hypotheses: (a) in the first place, we consider that in the situation of the online group discussion a lower number of changes of opinion will be registered than in that characterized by face-to-face discussions, and (b) in the second place, also the average extent of the change of opinion will be lower online than face to face.

2. Methodology

2.1. Participants

A total of 108 university students aged between 19 and 26 years (average age 21.5, S.D. = 0.50), of whom 51 males (average age = 21.5; S.D. = 1.94) and 57 females (average age = 21.4; S.D. = 1.61) took part in the research. They were recruited in different ways: presentation of the research during the classes, individual contacts and online advertisements. The distribution by degree course shows a majority of students of Psychology ($N = 66$, or 61.1%), Economics ($N = 16$, or 14.8%) and Literature ($N = 8$, or 7.4%) and lower percentages of students from other Faculties. The participants belonged to the middle class, were almost all habitual Internet users (97.3%) and about half (52.7%) used computer-mediated communication like discussion forums and chat lines. Participation was voluntary, without any recompense or advantage in course terms.
A criterion for inclusion in the sample was the absence of relations of friendship or simply acquaintance among the students: these might have affected the impartiality of the discussion (Gruenfeld, Mannix, Williams, & Neale, 1996).

The subjects were assigned randomly to two experimental conditions. The first was characterised by a face-to-face discussion, conducted in a lecture room of the University, the second by an context of computer-mediated communication through a chat room created ad hoc.

The participants in the face-to-face discussion were 58 subjects, 27 males and 31 females, average age 21.4 (range 19–26), while in the computer-mediated communication discussion the participants were 50 subjects, 24 males and 26 females, average age 21.5 years (range 19–26).

The discussion groups, varying between three and five participants, were formed by seeking to observe a criterion of balance between sex, faculty and course year, avoiding in relation to gender differences the phenomenon of token presence (cf. Kanter, 1977), that is a proportion for those belonging to the minority sex of less than 20%. The group discussion took place with a minimum of three participants, the lowest possible number suitable for allowing the creation of group dynamics (cf. Hogg, Abrams, Otten, & Hinkle, 2004), and where technical problems or withdrawals meant it was not possible to reach this minimum, the subjects were excluded from the sample used for the analysis.

The distribution of the participants in the two experimental conditions was balanced, as Table 1 shows.

### 2.2. Design and procedure

The research was constructed to verify which of two experimental conditions (face-to-face vs. online discussion) favoured a change of opinion. The subjects were presented with two options regarding a project to restructure their university refectory and they were asked to choose one of them. The task, of the choice-dilemma type, was formulated by us in such a way as to entail a taking a decision between two alternatives. The first, low risk option, (Option A), contemplated the minor enlargement of the university refectory with a partial reduction in inconvenience (queues and crowding), balanced against an unvaried cost of the meal ticket. The second, high-risk option, (Option B), offered the advantage of a considerable expansion of the refectory, which would completely eliminate the inconvenience caused by overcrowding, balanced against uncertainty about the cost of the meal ticket, which could rise considerably in price, in the event that

### Table 1

<table>
<thead>
<tr>
<th>Sex</th>
<th>Total</th>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>Females</td>
</tr>
<tr>
<td>Chat condition</td>
<td>24</td>
</tr>
<tr>
<td>Face-to-face condition</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td></td>
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$\chi^2 = 0.02; \text{ d.f.} = 1; \text{ n.s.}$
the refectory was not full every day, and could be reduced in the event that the refectory
was fully used.

In giving the task, the purpose of the discussion was presented fictitiously as promoted
by the University which, before taking a decision on which university refectory restructur-
ing project to adopt, wished to know the opinions of the students. The participants in the
face-to-face discussion received the two options on paper while the online condition par-
ticipants were sent them via e-mail, shortly before the beginning of the test. The themes
proposed for the discussion are contained in Appendix A.

The research was divided into two phases. In the first phase, the subjects were asked
to discuss in a group the text with the two options (for 10 min in the face-to-face con-
dition and for 15 min\(^1\) in the online) and encouraged to express their preference for one
of the two. After having obtained answers from all the participants and evaluated them,
the researcher launched the second phase of the research with the introduction of the
conditioning message. He communicated that, contrary to expectations, the Administra-
tion of the University had already taken a decision about the restructuring of the refe-
tory and then communicated to the group the opposite opinion to that expressed by the
majority of that group. If, therefore, the majority of the group had already chosen
Option A, it was communicated that the Administration of the University had judged
Option B to be more suitable and vice versa (Appendix B contains the two options).
The purpose of this information intentionally attributed to an authoritative source (cf.
Knowles & Linn, 2004), was that of encouraging changes in the opinion previously
expressed. The participants were then invited to take account of the new decision and
to prolong the discussion for 10 more minutes (15 in the online condition), at the end
of which they again received the request to communicate their preference for one of
the two options.

Once the session had terminated, the researcher communicated the real objective of the
research, explaining that if in the recruitment phase the purpose of the discussion had been
explained, involvement and attention to the analysis of the problem would have been
affected. None of the participants showed perplexity or dissatisfaction.

2.3. Measurement and analysis of the data

The datum which we were interested in measuring in this research was the difference
between the opinions expressed in the first phase and those expressed in the second, after
the introduction of the conditioning message, both in terms of the change of opinion
and as the extent of this change. We decided not to gather the participants’ opinions
on two scales, one for each option, since in this way we would only have been able
to discover changes of opinion, not the extent of the change. We preferred to use a Lik-
ert 6 point scale including the two options which obliged the subjects to make a single
choice, preventing them from expressing intermediate positions between the two options.
The Likert 6 point foresaw the following scores: 1 = very much in agreement with
Option A, 2 = quite in agreement with A, 3 = little in agreement with Option A, 4 = lit-

\(^1\) We decided to increase to 15 the time allowed for online discussion groups on the basis of a calculation of
supplementary time necessary for the sending and reception of messages (Walther, 1996).
tle in agreement with Option B, 5 = quite in agreement with Option B, 6 = very much in agreement with Option B.

Every participant was asked to give his opinion twice. From the comparison of the judgements expressed before and after the introduction of the conditioning message, two principal measures were obtained:

(1) **Number of changes of opinion.** By “change of opinion” we refer to every case in which a participant who at first was favourable to an option modified his opinion following the introduction of a conditioning message and became favourable to the other option (making a complete reversal). The score “1” was assigned to participants who changed opinion, the score “0” to those who did not change. Since this variable is a nominal one (change of opinion vs. non-change of opinion), the analysis of the differences between the two experimental conditions was carried out by means of Pearson’s chi square test.

(2) **Extent of the opinion change.** This is a measure obtained by the comparison between the value expressed by the subject on the Likert scale before the introduction of the conditioning information and that expressed after the conditioning information. The extent of the change in opinion is equal to the absolute value of the difference between the two scores. For example, if the subject, in the first phase, expressed the opinion “quite in agreement” with the high-risk option (to which a score of 5 corresponds on the Likert scale) and modified it, in the second phase, to “little in agreement” with the low-risk option (score of 3 on the Likert Scale) he/she obtained a score of extent of opinion change equal to 2. The value of the extent of opinion change is found in a range between 1 and 5. The non-change of opinion obtains the value 0. Since this is an ordinal variable, the analysis of the differences between the two experimental conditions was conducted with the Mann-Whitney test for independent samples.

3. Results

Before analysing the change of opinion, let us see what the choices of the participants were in relation to the two options proposed (see **Table 2**). The chi-square test ($\chi^2$) options proposed and discussion conditions), shows that the participants in the face-to-face discussion expressed a preference for the high-risk Option B, while those who in the online discussion made equally distributed choices ($\chi^2 = 5.72$; d.f. = 1; $p < 0.05$). Gender differences are not significant in orienting towards Option A or B ($\chi^2 = 3.39$; d.f. = 1; n.s.).

**Table 2**

<table>
<thead>
<tr>
<th>Preference for Option A or B in the two experimental conditions</th>
<th>Experimental condition</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>Face to face</td>
<td>Chat</td>
</tr>
<tr>
<td>Preference for Option A</td>
<td>16 (27.6%)</td>
<td>25 (50.0%)</td>
</tr>
<tr>
<td>Preference for Option B</td>
<td>42 (72.4%)</td>
<td>25 (50.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>50</td>
</tr>
</tbody>
</table>

$\chi^2 = 5.72$; d.f. = 1; $p < 0.05$. 
Let us see now the influence exerted by the conditioning message, analysing first the change in opinion and then the extent of this change.

Twenty-seven (25.0%) subjects modified their previously expressed opinion following the introduction of conditioning information. The comparison between the two experimental conditions show that the number of changes of opinion is significantly higher in the face-to-face condition than in the online one ($\chi^2 = 11.17; \text{d.f.} = 1; p < 0.001$). In fact, the number of people involved in the face-to-face discussion that have modified their opinion is 38%, against 10% in the online condition (see Table 3).

<table>
<thead>
<tr>
<th></th>
<th>Face-to-face</th>
<th>Online</th>
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<tbody>
<tr>
<td>Change</td>
<td>22</td>
<td>5</td>
</tr>
<tr>
<td>Non-change</td>
<td>36</td>
<td>45</td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>50</td>
</tr>
</tbody>
</table>

$\chi^2 = 11.17; \text{d.f.} = 1; p < 0.001$.

The relation between changes of opinion and gender differences has not shown significant connections ($\chi^2 = 0.11; \text{d.f.} = 1; \text{n.s.}$).

Besides the number of subjects who modify their opinion we are also interested in verifying the extent of this change, that is the distance between the position expressed before and after the conditioning message. The subjects, in fact, could modify their opinion by slightly moving away from their initial position or effect a more radical and stronger change signalling the effective decision to adopt another opinion. The comparison between the two experimental conditions with the Mann-Whitney test indicates a significant difference ($U = 1065.5; p < 0.005$) with an average rate of change of opinion of 1.21 in the face-to-face condition and of 0.48 in the online one. Thus, the rate of opinion change in the face-to-face condition is significantly higher than the rate of opinion change in the computer-mediated condition.

The relation between the gender differences and extent of change does not prove significant ($U = 1372.0; \text{n.s.}$).

### 4. Discussion

The results of the research have shown that the conditioning message in the chat discussion exercised a markedly lower influence than the face-to-face discussion.

In fact, both the number of subjects who changed opinion after the introduction of our message and the extent of the change are significantly lower in the chat line discussion than in the face-to-face one. It seems that we can say that chat line discussions guarantee the subjects a more possibility of reflecting on the contents of the message, excluding the possibly misleading various sources of influencing.

This phenomenon that our research highlighted can be explained by considering some elements identified in previous studies. In terms of group processes, it is widely documented how the opinion expressed by other members of the group represents a strong source of influencing (Asch, 1952, 1956). It is very probable that in the face-to-face condition of our research physical proximity to people who sustained their posi-
tion energetically facilitated the opinion change, while in the chat discussion the absence of physical interlocutors in the proximity allowed their opinions to be maintained. Bibb Latanè’s observation (1981) confirms this hypothesis, according to which the stability of individual attitudes varies in proportion to the nearness and number of sources of social influence present in the social group to which they belong, in a similar way to what occurs with physical forces like the force of gravity. In other words, the social influence to which a person who takes part in a face-to-face discussion is subjected will be modified in direct proportion to the number of participants, to the nearness of these people to the target subject, and to the strength – in the sense of significance, importance and prestige/power of those who exercise an influence (Latanè ibid). From this perspective, since in the chat condition of our research the physical presence of other people was not foreseen, we can state that the social pressure typical of a group condition was lacking, favouring resistance to the conditioning message. However, it is true that, also in this study, the chat discussion group was not totally absent because the subjects were well aware of the others’ opinions and, in many cases, certain members found themselves decisively in the minority (for example, 4 against 1); they certainly experienced the pressure of the majority even though they resisted it. The concept of group in this research, however, is not expressed in its authentic sense as a collection of subjects with its own group identity constructed through time and in the recurrence of the meetings (Walther, 1996), but rather as a collection of individuals without common norms of reference. For these reasons, in our case we did not find the phenomenon described in the separation/de-individualization model (SIDE) of Spears and Lea (1992), according to which people who communicate via a computer reach a state of de-individualization and conform to the norms of their group, above all when they are confronted with other groups. Since the group, in the weak acceptance of our study, certainly implies a pressure of many on few in the context of exchanges between individuals who have not yet had to construct over-arching rules, we can maintain that precisely this favoured resistance to pressures. Therefore the importance of individual more than group aspects makes an interpretative key focused on the role of cognitive processes involved in the elaboration of information seem particularly appropriate. For this reason we cite the two elaboration routes – the central and the peripheral – described in Petty and Cacioppo’s model (1986), of which we have spoken previously. It seems to us, in other words, that while our subjects engaged in the chat line discussion could have activated a central route of elaboration of information, those who interacted face to face could have followed the peripheral route, which is more immediate and less deep (Petty and Cacioppo, ibid). In fact, motivation and interest in the subject of the discussion being equal, it is probable that interaction via a chat line, because of its particular characteristics, i.e. the absence of social and relational distracters and non-verbal stimuli, has allowed the employment of more careful processes of reasoning and types of central route, which helped the subjects to reflect and to reject the conditioning message. On the contrary, these are mechanisms that face-to-face discussion, which is rich in contextual and relational stimuli, discouraged, encouraging the subjects to pay less attention to the content and meaning of the message. The latter was processed less carefully and on the level of peripheral route and would thus penetrate more easily, creating greater support from subjects.

We should not underestimate another aspect connected to the meaning that computer-mediated communication transmits regarding self-perception of individual identity. Math-
eson and Zanna (1988) found that the condition of computer-mediated communication represents a highly reflective experience which allows one to expand self-awareness, and also Joinson (2001) confirmed how, in computer-mediated communication, a reduction in the awareness of the public self corresponds to an increase in the awareness of the private self.

In this sense the cognitive mechanisms of elaboration of information are interlinked with the perception of self as interactive subjects. Thus, while in the chat line discussion mechanisms of marked private self-awareness converge with central information elaboration routes, reinforcing one another, in the face-to-face discussion the opposite occurs and mechanisms of greater awareness of the public self are combined with the peripheral elaboration of information, inducing greater “docility” in the acceptance of the conditioning message. The preliminary results of a research study by Sassenberg, Boos, and Rabung (2005) further confirm how a marked self-awareness on the part of the private self determines a greater resistance to interpersonal influence.

To summarise, therefore, the explanation of our data regarding the resistance to the conditioning message resides in the simultaneous presence of diverse elements which have operated on an individual and a group level, such as: cognitive facilitation in acceding to the central information elaboration route for participants in the chat line condition; increased awareness of the “private” self and reduced pressure of social influence from the group, also for the participants in the chat line discussion.

These factors together have generated in the chat condition a sort of cognitive and emotional facilitation in evaluating the conditioning message more objectively, and consequently a lesser propensity to let oneself be influenced by it.

5. Strengths and limitations of the research

A strong point of this research is the good conformity of the methodology to the real interactive situation investigated.

Firstly, the experimental conditions attempted to simulate and follow as accurately as possible the modes of interaction to which we referred: the participants’ discussion in the face-to-face condition was in a laboratory, but in a room furnished in the normal way, while the participants in the chat condition took part from their homes.

Secondly, the subject of the discussion was closely linked to university life and concerned a decision-making task which the participants found stimulating, realistic and motivating.

Thirdly, the masking of the research was completely plausible because it is the practice of the university administration to promote student discussion groups focused on the quality of university life.

The comparison between the two experimental conditions showed a frequency almost three times greater (40.4% against 13.5%) for the number of changes of opinion in the face-to-face condition compared to that of the chat line: four people out of ten were influenced by the conditioning message in the face-to-face condition against only one in the computer-mediated communication. This datum, which is already significant, could have been more so if we had applied a methodology similar to that of Asch’s research (1952, 1956), i.e. one focused on a single participant at a time with “accomplices” trained to induce him/her to change opinion.
Deciding to “let the groups be free” permitted us to verify, on the contrary, the real and not piloted impact of the conditioning information in the two experimental conditions, in a much more similar way to what would happen in a real situation. Thanks to these choices, the research allowed us to highlight phenomena that concern precisely the functioning of real interactive face-to-face groups.

The main limit of the research, however, concerns the lack of verification of opinion change time stability. As Petty and Cacioppo show (1986), the results of persuasion are different according to whether the persuasive message has been elaborated through the central or the peripheral route. In particular, according to the Authors, “Attitude changes that result mostly from processing issue-relevant arguments (central route) will show greater temporal persistence, greater prediction of behavior, and greater resistance to counterpersuasion than attitude changes that result mostly from peripheral cues” (Petty & Cacioppo, 1986, p. 175). In this research this aspect has not been considered: if, as we hypothesised, the change of opinion in the face-to-face discussion took place mainly through the peripheral route, then the convictions of the subjects that changed their minds following the introduction of the conditioning message should be weak and subject to a new change in the short term. On the contrary, the people who changed opinion in the chat discussion – if they really used the central information elaboration route – should have maintained this opinion more persistently through time.

A second limit of the research concerns the sample of volunteers, represented by university students. Although there is no reason to suppose that students are characterized by a degree of susceptibility to persuasion different from that of the general population (in fact, the literature tends to maintain that there do not exist permanent characteristics of the receiver that are consistently correlated with persuasive effectiveness, cf. Perloff, 2003), utilizing a too homogeneous sample makes it difficult to generalize the results. We can consider, for example, that the IT competence of the population of reference is lower than that possessed by university students, and that therefore people who are little skilled in the use of the computer can allow themselves to be influenced more by a persuasive message conveyed by CMC owing to a sort of “awe” of the medium. In this case, our results could be explained by a greater “shrewdness” of students with regard to the medium, and not by the cognitive effect to attribute exclusively to the mode of communication.

6. Future directions

The results discussed thus far allow us to conclude that utilizing chat line for discussions, at least in the groups with a “zero history”, leads people to be less sensitive to the effects of external conditioning coming from a source considered to be influential.

However, in the future it will be necessary to confirm this first conclusion, by utilizing samples which are more numerous and more representative than university students.

In particular, it appears to be opportune to verify whether the change of opinion which is found in chat discussions – attributed by us to a combination of factors but above all to a cognitive facilitation in the access to the central path of information elaboration – is really stable and really persists through time. If the computer could allow preferential access to central paths communication, in fact, rarer but also more stable changes of opinion could occur than in face-to-face communication. This means that to obtain a change of
opinion through CMC, particularly convincing and valid messages (from all points of view) could be necessary; but also that the effect of the persuasion through these messages could be particularly lasting and such as to promote an authentically new conviction and not only a temporary change dictated by the desire to please.

Obviously this conclusion, subject to further verification, could be of some interest also for its applicatory implications in the field of information technology.

Acknowledgement

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Appendix A. Theme proposed for the discussion

The University provides its students many services and facilities. Among these is the refectory service, which supplies meals at a cheap price. In particular, at the moment we are seeing a constant growth in the number of students that have lunch in the refectory, and the building that hosts the refectory is now inadequate to meet the demand, as the number of seats is just 500.

Given this growing number of students that decide to have a meal in the refectory, and given the growing discomfort for them due mainly to the lack of seats and to the long wait in the self-service lines to actually get a meal, the University Administration has decided to enlarge the refectory.

A projection of the possible stream of students in the refectory, based on the present number of students enrolled in the University, shows indeed how the number of users of the refectory could be rationalized if the structure did not have the limitations described above.

Enlarging the refectory building would have the side-effect of improving the refectory’s financial status, which at the moment is operating at a loss of about 1,500€ at a day, mainly because of the low-priced lunch ticket for each student (5 Euros).

The Administration has envisaged two options for this enlargement:

(a) A smaller enlargement of the refectory (300 seats) and of the self-service area. With this option the meal ticket would remain unchanged (5 Euros), and the capacity of the refectory (now at 800 seats), should be enough to improve the budget. The additional spaces made could partially mitigate the discomfort due to crowding.

(b) A more significant enlargement of the refectory (1,500 seats) and of the self-service area. The refectory capacity would reach 2,000 and the greater space of the facility would fully eliminate the queueing problem and the inconvenience at the self-service. Whenever the canteen was fully used, the increase in the revenues could allow the Administration to reduce the meal ticket to 2.5 Euros. On the other hand, if the number of students using the refectory was equal to or less than 800, the meal ticket would rise to 7.5 Euros to cover the increased running expenses and the additional costs of the vacant (and thus unproductive) refectory section.
You are asked to discuss this issue in a group and to decide which of the two Options you would suggest to the University Administration. Try to take both pros and cons of the two Options into consideration, and reach a common position that is shared by all participants.

You must express a single preference on the following scale:

<table>
<thead>
<tr>
<th>Option A</th>
<th>Option B</th>
</tr>
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<tbody>
<tr>
<td>Strongly agree</td>
<td>Quite agree</td>
</tr>
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</table>

You can’t suggest other solutions than the two Options here proposed, because these have been already approved by the Technical Office of the University and are the only feasible options given the physical spaces of the facility and the personnel already employed.

Appendix B. Conditioning information

Option A:
“The University Administration – on the basis of an analysis of students’ flow in and out of the canteen – has informed us that Option A is the most suitable: it will allow the refectory to enhance its functioning and at the same time it will maintain the meal ticket at the current price. Option B is too ambitious and could be out of proportion to the students’ needs.”

Option B:
“The University Administration – on the basis of an analysis of students’ flow in and out of the canteen – has informed us that Option B is the most suitable: it will allow the refectory to enhance its functioning and at the same time lower the price of the meal ticket. Option A is too modest and could be inadequate for the students’ needs.”

References


