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Deindividuation effects on normative and informational social influence within computer-mediated-communication

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ABSTRACT

Research on social influence shows that different patterns take place when this phenomenon happens within computer-mediated-communication (CMC), if compared to face-to-face interaction. Informational social influence can still easily take place also by means of CMC, however normative influence seems to be more affected by the environmental characteristics. Different authors have theorized that deindividuation nullifies the effects of normative influence, but the Social Identity Model of Deindividuation Effects theorizes that users will conform even when deindividuated, but only if social identity is made salient.

The two typologies of social influence have never been studied in comparison, therefore in our work, we decided to create an online experiment to observe how the same variables affect them, and in particular how deindividuation works in both cases. The 181 experimental subjects that took part, performed 3 tasks: one aiming to elicit normative influence, and two semantic tasks created to test informational influence. Entropy has been used as a mathematical assessment of information availability.

Our results show that normative influence becomes almost ineffective within CMC (1.4% of conformity) when subjects are deindividuated.

Informational influence is generally more effective than normative influence within CMC (15–29% of conformity), but similarly to normative influence, it is inhibited by deindividuation.

1. Introduction

With the diffusion of social networking platforms, the social and information seeking-related human behaviors have been affected by the “new” environment. Information seeking increasingly takes place on social media platforms, relying on what a users' contacts and followed pages share (Zubiaga, Liakata, Procter, Hoi, & Tolmie, 2016).

Because of this filtering and selection, the users' knowledge-building process could be severely biased and polarized.

For example, a study shows that 72% of participants (college students) trusted links sent by friends, even if they contained phishing attempts (Jagatic, Johnson, Jakobsson, & Menczer, 2007).

The recent debate on fake news, highlighted the potential link between the increase in their spread, and the structure of social networks as well as their embedded algorithms, which turned these environments into “echo chambers”, in which users are selectively exposed to

information, and tend to filter the information in order to reinforce their positions (confirmation bias), rather than to find alternatives (Del Vicario et al., 2016).

These factors highlight the importance of studying the effects of social influence within computer-mediated-communication, in order to understand which environmental factors can enhance its effects.

Social norms exist also in online environments, but the users' perception of them can be different according to the platform, to anonymity and the social ties among contacts. Therefore, compliance to social norms can emerge in different ways, than those observable in face-to-face interaction.

Also, information-seeking behavior can be affected by online environments: on one side we observe its interrelation with social norms, especially when it takes place on social media platforms, and users gather information on the basis of what they read on their personal newsfeed. However, we also observe how users can rely on opinions

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expressed by unknown actors, as it happens on platforms like TripAdvisor.

The present study, using online experiments, aims to separate norms-oriented social influence from information-oriented social influence, in order to observe which elements and environmental factors have an effect on both typologies and which are peculiar for each.

1.1. Theoretical framework

A major understanding on the functioning of social influence came about thanks to the pioneering works of Sherif (1937) and then Asch (1951, 1955, 1956). The authors studied how the physical presence of other people can lead experimental subjects to conform their judgment to the one of the others. They used two different types of tasks: while in Asch conformity experiments, guessing the correct answer could be straightforward (Asch, 1955, 1956; Asch & Guetzkow, 1951), Sherif used the autokinetic effect, so a more ambiguous task, to test the effects of social influence (Sherif, 1937). From these experiments, two typologies of social influence have been identified, called “normative” when people conform in order to satisfy a need to belong and comply to social norms, as observed in Asch's experiments, and “informational” when the subjects lack on information in order to perform a task, as observed in the autokinetic experiment (Deutsch & Gerard, 1955). According to this theorization proposed by Deutsch and Gerard (1955), we can say that we are able to observe normative social influence in Asch's conformity experiments, because the task is relatively easy and the subjects, when interviewed after taking part to the experiment stated that they were able to spot the correct answer, but conform in order not to break the social norms and be group outsiders. Instead, given that the task presented in the autokinetic experiment is more ambiguous, as it is based on a visual illusion, in this case we can say that subjects conform because they are unsure on how to proceed.

While, as observed in these classical studies, to elicit conformity in face-to-face situations, the physical presence of other people and being exposed to their judgment can be enough, things go differently when people interact online, especially for normative social influence.

Indeed, it is still unclear which elements can have the power to lead people to conform during computer-mediated-communication.

Deindividuation, namely the diminished perception of one's personal traits (Zimbardo, 1969), has been identified as a potential key element in the discourse on normative influence.

The original deindividuation model was proposed by Zimbardo in 1969, and the author identified a series of variables that according to him can lead to a deindividuation state. The variables considered by Zimbardo are for example anonymity, arousal, sensory overload, novel or unstructured situations, involvement in the act, and the use of altering substances (Zimbardo, 1969). Several other authors suggest that if people interact while being in a deindividuation state, normative social influence can disappear (Deutsch & Gerard, 1955; Latané, 1981; Lott & Lott, 1965; Short, Williams, & Christie, 1976). This happens because there is not the possibility to identify the interlocutors, due to a lack of actual or perceived proximity, and consequently, deindividuation should lighten the pressure to act according to social norms (Latané, 1981).

Furthermore, a study which tested antinormative behavior by counterposing deindividuation to the presence of an explicit aggressive social norm, showed that subjects were actually more aggressive when deindividuated, rather than when exposed to the explicit norm, so in this case, deindividuation resulted to be more powerful in leading to antinormative behavior (Mann, Newton, & Innes, 1982).

A significant advancement in explaining the functioning of normative social influence in online environments is represented by the contribution provided by the Social Identity Model of Deindividuation Effects (SIDE Model), that takes the concept of deindividuation and expands it, explaining its link and implications on social influence in online environments (Spears, Postmes, Lea, & Wolbert, 2002).

The authors theorize that deindividuation is indeed likely to occur in online environments, but it can become a powerful tool to trigger conformity: given that while deindividuated, subjects have a diminished perception of their personal traits, if the group the subjects are interacting with is made salient, then the subjects will be more likely to conform (Spears, Postmes, & Lea, 2018).

This happens because combining a lack of relevance of one's personality with an enhancement of the importance of the interlocutors, will lead the subjects to identify at the group level, and consequently to comply to the social norms. The experimental results seem to confirm the predictions presented by the SIDE Model (Lee, 2004; Postmes, Spears, Sakhel, & De Groot, 2001), but it is not clear what happens when users are deindividuated but the group saliency is not enhanced.

On the matter of informational influence during computer-mediated-communication instead, studies have focused on different aspects.

As aforementioned, a visible example of informational influence in online environments is represented by users making choices on the basis of reviews or ratings provided by other unknown users while using platforms such as Tripadvisor, Uber or Airbnb (Liu & Zhang, 2010), but other examples show that it can take place easily also in other ways.

A study conducted by Rosander and Eriksson (2012), shows that users facing a general knowledge quiz in which they were exposed to histograms showing the distribution of the answers provided by other unknown users, conformed in high percentages (52%).

While many studies on online consumers behavior focused on factors such as the perceived importance of feedback (Liu & Zhang, 2010) on informational influence, or on the conjunct effect of informational and normative influence on behavior when subjects interact without personal contact (LaTour & Manrai, 1989), no study tried to isolate it, and point out the environmental factors that could be able to enhance or diminish the compliance of users in this case. Furthermore, no study tested the effects of deindividuation on informational influence.

In order to test and fulfill the predictions developed based on the literature, we developed an experimental framework aiming to study separately the two typologies of social influence during computer-mediated-communication.

On one side, we reduced group saliency to test how deindividuation works on both typologies of social influence and controlled the possible interactions between some psychological dimensions and the operative variables.

On the other side, we calculated the items entropy to test if task ambiguity increases informational-based compliance. The environmental factors that we decided to manipulate and study in relation to both typologies of social influence are anonymity and physical isolation, as their combination can trigger deindividuation.

1.2. Overview and predictions

To test online normative influence, we replicated Asch's conformity experiment (Asch, 1955, 1956; Asch & Guetzkow, 1951) on a web-based platform, while to test online informational influence we created two linguistic tasks of increasing ambiguity, designed adopting the same structure of the “classical” Asch's items. Task ambiguity was measured by calculating the items' entropy, and in this way, we were able to assess the subjects' lack of information. The diversity of the tasks, allowed us to measure the interaction between anonymity, physical isolation, and degree of ambiguity, in relation to the behavior of the experimental subjects. Considering the literature, we could formulate the following predictions:

- H1) Diminished effectiveness of normative influence due to the combination of a deindividuation state given by anonymity and physical isolation, and minimum levels of group saliency, as theorized by several authors (Deutsch & Gerard, 1955; Latané, 1981; Lott & Lott, 1965; Short et al., 1976) and hypothesized by the SIDE

Model (Postmes et al., 2001).

- H2) There is no specific evidence to build on, on the potential relationship between deindividuation and informational influence (if separated by normative influence), but we expect it to have the same inhibitory effect it has on normative influence (Lee, 2007). The effect of the anonymity and physical isolation variables alone will also be controlled.
- H3) We expect a positive correlation between conformity and task ambiguity, given that with more ambiguous items the subjects will possess less information on how to handle the task, and might rely on other people's judgment (Cialdini & Trost, 1998; Rosander & Eriksson, 2012).

We also controlled the interaction of personality and psychological traits on conformity. In order to make sure that the analyzed effects were relatable to the manipulated features and not to particular psychological traits, we measured the psychological dimensions that according to literature, result related to some extent to conformity. Only a few studies analyzed the relation between conformity and personality traits, suggesting some interesting connections between social conformity and Emotional Stability, Agreeableness and Closeness (DeYoung, Peterson, & Higgins, 2002). So we expect that:

- H4) Factors as Neuroticism, Surgency (a trait linked to Extraversion) and Closeness will have an inhibitory effect on conformity
- H5) Agreeableness will increase the tendency to yield to majority pressure.

However, it is necessary to consider the contextual peculiarities, illustrated by both the deindividuation explanation provided by literature (Latané, 1981; Postmes et al., 2001; Tsikerdekis, 2013), and the theoretical framework supporting the idea that real and virtual identities are not consistent (Kim & Sherman, 2007), that highlight the lack of saliency of personality traits in anonymity conditions, which may predict a:

- H6) weak general effect of personality traits, especially if measured with scales calibrated to assess “real life” traits.

Finally, since the experiment was conducted both in group and single (i.e., physical isolation) conditions, according to the existing literature that illustrates how the mere presence of other people can affect an individual's performance (Markus, 1978), we expect:

- H7) Physical isolation and group conditions to produce significantly different behavioral outcomes.

2. Method

In order to analyze the variables and dimensions of interests, the experiment was structured as follows. To analyze the anonymity effect on conformity, we manipulated anonymity levels making the subjects perform the experiment in either full or partial anonymity (i.e., anonymity vs nonymity). In the full anonymity condition, the participants were distinguished from the other group members by a number representing their response order, while in the nonymity condition they had to provide their name and surname and could see the others'. To test the physical isolation variable, we made the subjects perform the experiment alone (physical isolation) or with other experimental subjects in the same room (group condition). In the group condition, the subjects were not interacting with each other but with other agents: the group of confederates in the platform was composed by programmed bots that in some trials provided the correct answer, and in some other the wrong one. In order to induce normative influence, we adapted Asch's original line-judgment task for an online support and administered it as first task (Asch, 1956). We also maintained the original

pattern in making the confederates provide wrong and correct answers. Adopting the structure of the classic Asch's experiment, we designed two brand new tasks, respectively labeled “cultural” and “apperceptive”, in order to manipulate ambiguity both between tasks and among the single items. The cultural task consisted in a target word (primer) associated with three possible answer options more or less semantically related (targets). The apperceptive task, instead, consisted in three different combinations of real and invented words (i.e., condition A: real primer word vs invented words as answer option; condition B: invented primer word vs real words as answer option; condition C: invented prime word vs invented words as answer option). In order to measure the informational influence effects, we first estimated the items' entropy, defined as an inverse function of the probability to observe a certain association between the prime and the target. The entropy of each item, measured by means of a preliminary survey administered to an ad hoc sample, represents a quantitative estimation of the “lack degree” of information contained by each item. A study on the voting tendencies related to conformity, hypothesized this factor to be inversely related to entropy, since the more predictable the behavior is (i.e., low entropy), the higher is the tendency to conform (Coleman, 2004). Nevertheless, such result describes the behavior of a subject under a direct majority pressure. In our study we exposed the experimental subjects to a constant majority pressure always towards a more entropic answer. In this way, the cultural and apperceptive tasks, investigate the relation between entropy of the choice, and the informational influence dynamics.

2.1. Sampling and participants

The research was conducted in accordance with the guidelines for the ethical treatment of human participants of the Italian Psychological Association (AIP). The participants were recruited with a snowball sampling strategy. Most of them were undergraduate students from an Italian university. All participants gave their consent to participate and had the possibility to withdraw from the experiment at any time. The participants were 181 (76.8% identifying as female) and all of them were over 18 years of age (age: M = 22.11, S D = 4.44). All the participants filled out the survey and none of them withdrew during the experiment. In order to obtain a robust approximation of the optimal sample size, disregarding the debate about the standard sample size estimation for GLMM (Bolker et al., 2009), we conducted a power analysis by reducing the hypotheses to the case of two samples' mean comparison under a 2-sided equality hypothesis (eqs. (1)–(3)) (Chow, Shao, Wang, & Lokhnygina, 2017). The results are reported in Table 1.

$$n_b = \left(1 + \frac{1}{K}\right) \left(\sigma \frac{Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}}{\mu_a - \mu_b}\right) \tag{1}$$

with

$$1 - \beta = \phi\left(Z - Z_{1-\frac{\alpha}{2}}\right) + \phi\left(-Z - Z_{1-\frac{\alpha}{2}}\right) \tag{2}$$

and

Table 1

Sample size estimation using the variable Conformity as dependent measure, to compare 2 means from 2 samples with 2 sided equality hypothesis, requiring a Power (1 - β) of 80%, and a Type I Error confidence level (α) of 5%.

Dimension	Mean test (SD)	Control mean (SD)	K N _a /N _b	Sample size	
				Required	Available
Anonymity	18% (11%)	15% (7%)	1.06	86	88
Physical Isolation	18% (10%)	14% (7%)	0.5	106	120

Table 2
Physical Isolation versus group conditions.

Condition	Frequency	Percentage
Physical Isolation [PI(1)]	120	66.3
Group Condition [PI(0)]	61	33.7
Total	181	100

$$Z = \frac{\mu_A - \mu_B}{\sigma \sqrt{\frac{1}{n_a} + \frac{1}{n_b}}} \quad (3)$$

where, $K = \frac{n_a}{n_b}$, σ is the standard deviation, Φ is the standard Normal distribution function, ϕ^{-1} is the standard Normal quantile function, α is Type I error, and β is Type II error, meaning $1 - \beta$ is power. This analysis revealed that approximately 180 participants would be needed to achieve 80% power ($1 - \beta$) at a 0.05 α level ($\alpha = 0.05$).

The exclusion criteria regarded any type of psychiatric diagnosis and a lack of fluency in the Italian language, since the cultural and apperceptive tasks were of semantic nature. Out of 181 subjects, 61 participants performed the experiment in the group condition (groups of six, seven or eight people), while 120 performed the experiment in the physical isolation condition (Table 2).

The participants were also balanced according to the anonymity condition and 93 performed the experiment in partial anonymity (i.e., “nonymity”), while 88 in full anonymity (Table 3).

Since the recruitment method consisted in a snowball sampling, we have not been able to balance the subjects according to their genders and as consequence, the majority of them identified as females (76.8%, versus 23.2% identifying as males). This factor has been controlled during the data analysis.

2.2. Materials and apparatus

At first, we administered a series of scales in order to determine psychological traits and states. The scales have been chosen according to the dimension they aim to measure and its relation to social influence. Studies have investigated the link between conformity and Big-Five traits, showing relations between some traits and conformity (DeYoung et al., 2002). Anxiety has been identified as a potential predictor for conformity, while self-esteem and self-efficacy predict the opposite tendency, namely nonconformity (Deutsch & Gerard, 1955). Finally, according to the literature, a high sense of community results to be positively related to conformity (McMillan & Chavis, 1986). For these reasons, we chose scales that measure the aforementioned dimensions:

- Five Factor Adjective Short Test (5-FasT) (Giannini, Pannocchia, Grotto, & Gori, 2012), a short version of the Big Five aiming to asses personality traits. It comprises 26 dichotomous items (true-false). All the subscales present a good reliability (Neuroticism = 0.78; Surgency = 0.73; Agreeableness = 0.71; Closeness = 0.71; Conscientiousness = 0.70)
- The State-Trait Anxiety Inventory for Adults (Spielberger & Gorsuch, 1983), a self-reporting 20-item measure on state and trait anxiety. The items are on a 4-point Likert scale whose range goes from 1 (not at all) to 4 (very much so). The scale appears to have an excellent test-retest reliability ($r = 0.88$) (Grös, Antony, Simms, & McCabe,

Table 3
Anonymity versus Nonymity conditions.

Condition	Frequency	Percentage
Anonymity [FA (1)]	88	48.6
Nonymity [FA (0)]	93	51.4
Total	181	100

2007).

- The Multidimensional Sense Of Community Scale, a 26-item scale on which each item is on a 4-point Likert scale (4-strongly agree to 1-strongly disagree). The scale results to have good reliability and good construct validity (Cronbach Alpha's from 0.61 to 0.80) (Prezza, Pacilli, Barbaranelli, & Zampatti, 2009)
- The Rosenberg's Self-Esteem Scale, a 10-item scale on which each item is on a 4-point Likert scale (4-strongly agree to 1-strongly disagree). The scale has an excellent internal consistency (coefficient of reproducibility of .92), and stability (0.85 and 0.88 on a 2 weeks test-retest) (Rosenberg, 1965).
- The General Self-Efficacy Scale (Sibilia, Schwarzer, & Jerusalem, 1995), a 10-item scale with items on a 4-point Likert scale (1-not at all true, 4-exactly true). The scale has a good reliability with Cronbach Alphas' ranging from 0.76 to 0.90 (Schwarzer & Jerusalem, 2010).

For what concerns the experiment, besides resizing Asch's visual task (Asch, 1956) for online supports, we created the cultural and apperceptive tasks, of semantic nature: examples of cultural and apperceptive tasks items are in Fig. 1.

Within the two tasks, we calculated the item's entropy, in order to mathematically assess the ambiguity of the stimuli. We presented the cultural items to a sample of 71 subjects and the apperceptive to 79 subjects, collected their answers and calculated frequencies and percentage. On the basis of the latter, we proceeded to calculate the entropy for items i , using an equation (4) with $p_j^k = (\sum_{i=1}^n r_i^k)/n$, and “ n ” indicating the respondents to item k .

$$E^k = \sum_{j=1}^3 - p_j^k \log p_j^k \quad (4)$$

Finally, according to the median, we divided the items in high and low entropy (Fig. 1). For what concerns the cultural and apperceptive items, the correct answer was the most chosen during the pre-test, so, when the majority gave a unanimous incorrect answer, they picked the least chosen option. However, differently from Asch's task, in some cases we randomized the majority's choices in order to make the interaction more believable. The experiment was composed by 20 Asch-task items, 45 cultural items and 45 apperceptive items, for a total of 110. The experiment was performed on an online software graphically based on the Crutchfield apparatus (Crutchfield, 1955), designed by us on Google Scripts (Fig. 2).

The interface was designed to allow interaction between the experimental subject and six other confederates, for a total of seven actors: the experimental subject was always placed in sixth position (Asch & Guetzkow, 1951), and the interface simulated the responses of six other non-existing subjects. It also provided the possibility to record the subjects' response times and control anonymity, displaying only numbers associated with each group member in the full anonymity condition, and asking to provide name and surname, and showing fictional names and surnames in the nonymity condition. The experimental subjects could see the answers of the other fake group members beside their name or identification, and the stimulus appeared only when their turn came. After the experiment, we administered a questionnaire investigating the subjects' experience, using questions based on Asch's post-experimental interview (Asch, 1956).

2.3. Procedure

The experiment was presented as a study on visual and semantic perception, in order to avoid biases. The group-condition experiment took place in a computer room, where groups of 6, 7 or 8 subjects, performed the experiment on distantly placed computers. The physical isolation-condition experiment, instead, took place in a laboratory, where the participants were alone with a maximum of three

Primer House	Answers (1) Wall (2) Petal (3) Journey	Primer House	Answers (1) Traffic (2) Pluto (3) Pelican
Primer Barrana	Answers (1) Pemana (2) Zoisca (3) Mescua	Primer Bubbioso	Answers (1) Orfadano (2) Ferano (3) Ireno

Fig. 1. Example of cultural and apperceptive items. In figure are shown three different examples of the stimuli adopted in the experiment. In the first row there are two examples of cultural items: in the first rectangle the primer is associated with three options, among which one is more semantically related than the others (low entropy), the second example present three untied options (high entropy). In the second row we can find two types of apperceptive stimuli with invented words both for the primer and the answer options.

experimenters. Every participant was given an ID code that needed to be reported in all the three experimental phases. The first phase consisted in the filling of the scales that took approximately 15 min. When completed, the participants could start the experiment, which took approximately 50 min to be completed. The first task was Asch's, the second the cultural and the third the apperceptive, and each phase was introduced by means of an informational page with instructions. The last phase consisted in the filling of the post-experimental questionnaire, and this phase lasted 10 min circa. When finished, the subjects were informed on the real purposes of the study and were told not to divulge details on the experiment, in order to avoid potential biases from the other experimental subjects.

3. Results

Fig. 3 shows the different percentage of conformity in each task. In Asch's task, the one used to test normative influence 1,4% of the subjects conformed to the majority when it gave a clearly incorrect answer. Conformity percentages grow significantly in the cultural task, with 15,2% of subjects conforming and the highest rate is registered in the apperceptive task, with 29,8% of conformity.

Both the cultural and the apperceptive tasks were used to test informational influence and more insights on the effects of this type of influence can be obtained by observing the results concerning entropy. Conformity increased significantly with higher entropy, thus with more ambiguous items (Table 4).

Since the tasks have always been presented in the same order (Asch first, then cultural and finally apperceptive), we conducted some analysis in order to verify if any eventual learning mechanisms could have occurred and invalidated the trustworthiness of conformity data. The

only interaction appeared between conformity and entropy but once controlled the entropy effect, no significant learning mechanism appeared, besides a slight negative effect of time on the cultural task. To analyze the relationship between conformity, physical condition, anonymity and personality traits, we used Generalized Linear Mixed Models, the size effect of which results to be 77%. From the model, emerged that conformity takes place differently whether subjects are physically isolated, anonymous or in both conditions happening at the same time (deindividuated). Full anonymity and physical isolation analyzed singularly have a positive relationship with conformity, but if these two variables interact (creating deindividuation), the relationship becomes negative (Table 4). This analysis also provided results regarding the effects of personality traits, in particular, Neuroticism, Surgency (i.e., Extraversion), Agreeableness, Closeness, Self-Efficacy and State and Trait Anxiety.

The factors that result to be positively related to conformity are Closeness, Self-Efficacy and State Anxiety. The traits that are negatively related to conformity, are Neuroticism, Surgency, Agreeableness.

4. General discussion and conclusions

The results of this study could help to explain the dynamics that can occur in online environments, where the different available platforms allow the users to interact under different levels of anonymity, and with known and unknown people. We found an almost non-existent effect of normative influence when social identity is not strengthened, with only 1.4% of the subjects conforming to Asch's task.

In our experiment, group saliency was minimal due to anonymity, the impossibility to communicate with the other members, and the absence of any type of information exchange (except fictional name and

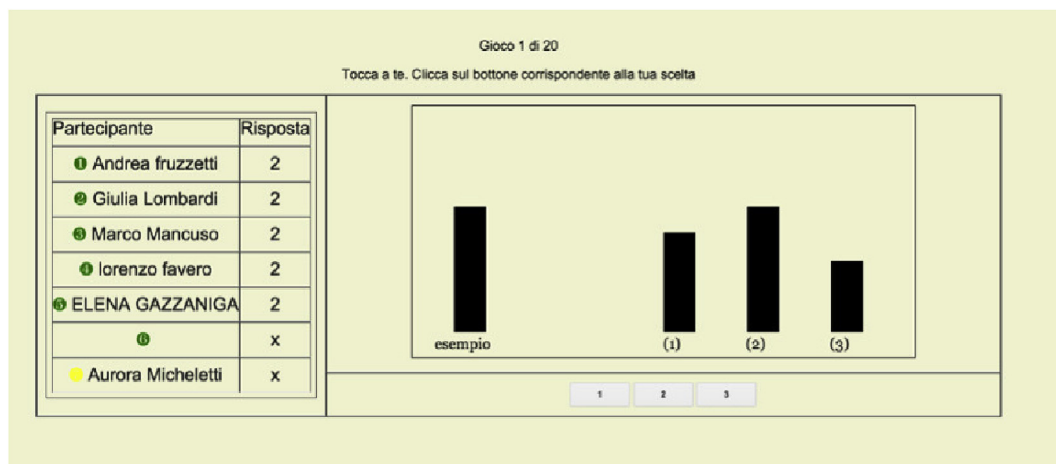


Fig. 2. Screenshot representing the interface on which the subjects performed the experiment in the nonymity condition.

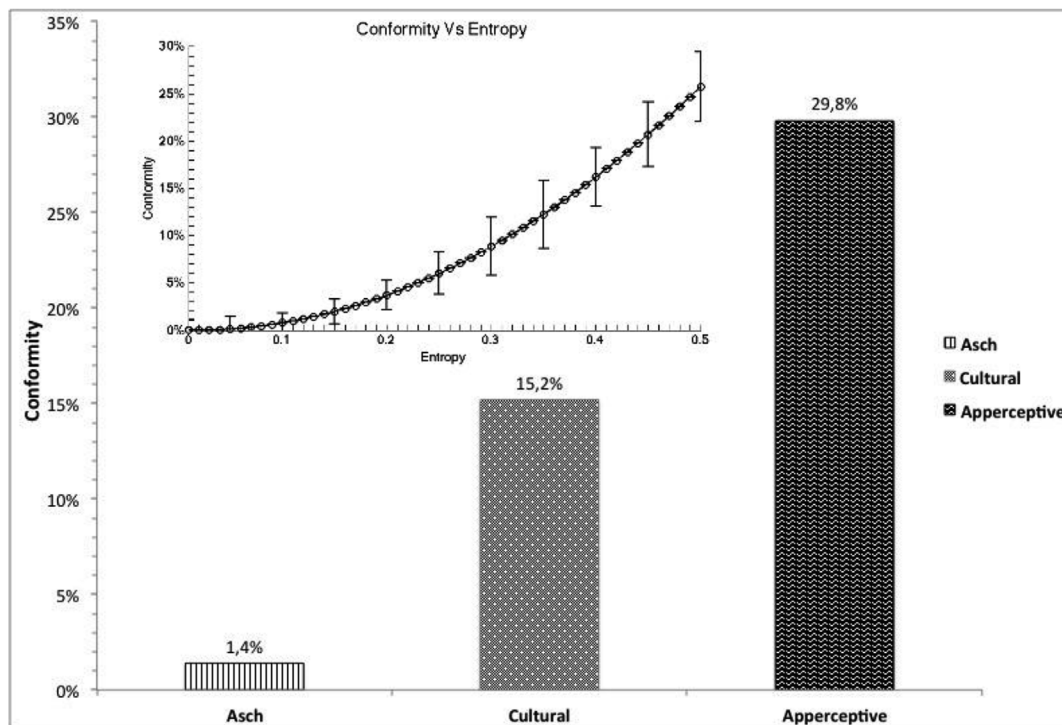


Fig. 3. Percentages of conformity in Asch, Cultural and Apperceptive tasks and Entropy's quadratic plot.

Table 4

Generalized Linear Mixed Model. Model's Size Effects: 66%. *** = $p < 0.001$, ** = $p < 0.01$, * = $p < 0.05$. The variables included in the model are entropy, anonymity, physical isolation, Neuroticism, Surgency, Agreeableness, Closeness, Self- Efficacy and state anxiety.

GLMM Best Model				
Model precision	Akaike ^a	F	Df-1 (2)	
81.5%	9396.12	67.67***	12 (9116)	
Parameter	Fixed effect (F)	Coefficient	St. Error	Student t
Entropy	672, 98***	8, 714	0,34	25, 94***
Full anonymity	23, 11***	2, 416	0,46	5, 31***
Physical isolation	10, 71***	0, 474	0,09	5, 78***
Neuroticism	7, 38**	-0, 027	0,01	-2, 72**
Surgency	7, 07**	-0, 032	0,01	-2, 66**
Agreeableness	23, 18***	-0, 042	0,01	-4, 81***
Closeness	6, 79**	0, 022	0,01	2, 61**
Self-efficacy	24, 09***	0, 046	0,01	4, 91***
STAI-State	9, 97***	0, 017	0,01	3, 16***
FA (1)*PI(1)	24, 94***	-0, 574	0,12	-4, 99***

surnames in the nonymity condition) concerning the group members. Furthermore, the subject did not engage in any type of cooperative task before the experiment, a method often used to enhance group saliency (Postmes et al., 2001).

Thus, we confirm the existing literature on deindividuation (Postmes et al., 2001), showing that deindividuation alone is an inhibitory factor for normative influence in online environments.

On the other side, when the focus is on obtaining information and the subjects' knowledge on a topic lacks because the task is particularly difficult or ambiguous, even unknown users can be considered a reliable source, even when deprived of cues about their actual level of knowledge. In fact, from our analysis, emerged that the strongest predictor of conformity is task ambiguity: entropy resulted to have a significant positive effect on conformity. In the case of the present study, entropy was modulated both within and in-between tasks, and we

registered a 15.2% of conformity in the cultural task, and a 29.8% in the apperceptive, the most ambiguous task.

These results confirm other studies (Rosander & Eriksson, 2012) that show the effectiveness of informational influence also in online environments. However, new evidence emerged from the present study, showing that two contextual characteristics can actually affect in a complex way the effects of informational influence: full anonymity, physical isolation, as well as their interaction (i.e., deindividuation). Anonymity and physical isolation taken separately have a positive effect on conformity, confuting the “mere presence-effect” hypothesis, at least in this case (Markus, 1978), but if combined, thus creating a deindividuation state, they actually reduce conformity. In this way, we can say that deindividuation has an inhibitory effect not only on normative influence, as theorized by the SIDE Model (Postmes et al., 2001), but also on informational influence within CMC. These results provide us interesting insights on the environmental and psychological elements that can affect information-seeking behavior in online environments. The large amount of information available on the Internet, combined with online social dynamics often lead users not to verify the credibility of sources, and the present study provides new insights that show that if users are deindividuated, their tendency to trust unknown sources of information is minor. This result has two potential implications, a socially-related one and an exposure-related one. The first one is related to the fact that such result suggests that in order to trust random information, the underlying social dynamics, namely, the perceived importance and/or trust towards who is supporting such information is crucial.

As the deindividuation perspective presented by the SIDE Model suggests, if there is no social identification with the group members, the effects of social influence will reduce and according to these results, this could happen also when the push towards conformity is not strictly related to a compliance with social norms, but rather to a need for information.

Future research could deepen this result, for example by focusing on the relationship between the spread of misinformation in social networks and informational influence, deepening how social dynamics underlie this process, to what extent they influence information

acceptance, and whether other contextual factors can affect this process, since this phenomenon is having a strong political and social impact.

The second implication is related to the subjects' feeling of exposure: if they perceive that there is no way to identify them, as they are both anonymous and physically isolated, they are more prone to disregard the opinions they are exposed to.

Future research could investigate, for example, whether this happens because subjects try to provide their own judgment, because they engage in explicit non-conformist behavior, or because they do not put too much effort in completing the task.

Finally, for what concerns the effects of personality traits, the ones which resulted to have an inhibitory effect on conformity are Neuroticism, Surgency (i.e., Extraversion) and Agreeableness, in line with the existing literature (DeYoung et al., 2002), while subjects with higher scores in Closeness, Self-Efficacy and State Anxiety conformed more.

These results however predict a small portion of the general tendency to conform, so further studies are necessary to understand the entity of the impact of personality traits on conformity and its predictability.

In line with the theoretical framework, the previous result could support the literature stressing how personality changes when users are online (Kim & Sherman, 2007).

Within such a background, any type of personality assessment referring to real-life personality traits could explain only a small portion of online behavior variance, and not fit with the purpose. Future research could develop new models of web-personality assessment tools in order to measure the impact of “online personality” on social influence and conformity.

Furthermore, the study presented here has some limitations that could be controlled in further research on the topic.

As mentioned while describing the sample, we have not been able to balance the subjects according to genders and we have an overrepresentation of people identifying as females. The more dated literature that explored the gender differences in conformist behaviors registered higher conformity in the females (Baumeister & Sommer, 1997), while more recent studies found no differences (Rosander & Eriksson, 2012). This could be due by the increasing push towards gender equality which resulted in a less strict adherence to the traditional division between gender roles that especially western societies (those in which the aforementioned studies were conducted) have experienced throughout the years.

Another limitation regards the diversity of the pool of participants.

For linguistic reasons related to the semantic nature of two of the three tasks, the participants had to be fluent in Italian, and this resulted in having mostly Italians taking part to the experiment, who, in the nonymity condition, interacted with bots to which were given Italian-sounding names and surnames.

We believe that these results can be generalized to other contexts and similar countries, but we must consider that cultural differences shaping the behavior in different ways may appear if the study is replicated elsewhere.

First and foremost, according to the literature, the perception towards conformity is different in individualistic and collectivistic cultures, where in the former it is a negatively connoted behavior, while in the latter it is generally seen more positively (Bond & Smith, 1996), therefore, with a broader pool of participants, different patterns might emerge.

In addition, according to the context, the level of contact with people having different backgrounds, and the potential prejudices or negative attitudes towards some social groups that the experimental subjects might present, there could be different levels of identification with the group members, if more information that indicates diversity is given to the participants. This factor could be interesting to control and analyze in further studies.

In the same way, at a broader level, the multiculturalism, general openness, political and social situation of the context could also affect the subjects' behavior in relation to the building of in-group and out-group perception towards the group members.

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