Social Validation of Everyday Knowledge: Heterogeneity and Consensus Functionality

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This article presents evidence supporting the idea that laypeople use specific types of informational cues about the composition of groups to derive and attribute validity to the knowledge conveyed by these groups. A pilot study and two experimental studies analyzed the role of consensus and heterogeneity information when participants attribute validity to the positions of opposing groups. We predicted that consensus information is moderated by heterogeneity information. When two groups are described as equally consensual, greater validity is attributed to the more heterogeneous group, while when one group is described as more consensual than the other heterogeneity information will not contribute to the validation of groups' opinions. Our studies support this prediction in different scenarios and with different manipulations of groups' composition in terms of their internal heterogeneity. These findings are discussed in the context of the role played by social metacognitive beliefs in everyday knowledge validation.

Keywords: validation of everyday knowledge; heterogeneity; consensus; attribution; social comparison

In the social world we are often faced with a host of alternative beliefs, attitudes, and opinions. Should we support a given economic policy or should we fight against it? And in everyday life we are told that brand x is better than brand y, and that brand x is the one for us (or is it brand y?). Often we simply lack the necessary knowledge to support our choice. How do we choose the "right" alternative? When feeling uncertain, what kind of strategies do people tend to adopt to attain certainty or to validate their everyday knowledge? What kind of contextual or informational cues do people use in order to derive certainty or credibility concerning already acquired knowledge, or new knowledge acquired via social interaction? In this article, we will first provide a brief overview of previous approaches to knowledge validation; we then argue that heterogeneity of those that share some form of knowledge is used as an informational cue to derive knowledge validity. We then present three studies that illustrate the moderation of variability on consensus information in the process of validating group opinions.

To socially validate knowledge is to share with others a common representation of reality (Moscovici, 1984; Hardin & Higgins, 1996; Levine & Moreland, 1999) and invest it with credibility. According to Festinger's (1954) social comparison theory, individuals possess a basic motivation to evaluate and validate their knowledge, and in the absence of objective means validation occurs through comparison with others. For instance, Festinger, Gerard, Hymovitch, Kelley, and Raven (1952) showed that when participants were informed that the majority of their colleagues disagreed with them, they showed less confidence in the validity of their opinions and

changed them toward the majority (rather than the minority).

However, as suggested by Gerard and Orive (1987), opinion comparisons are not always real or explicit; they may also occur at an implicit level, that is, the comparison process may be imagined or projected. In this vein, the idea of the "illusion of universality" proposed by Allport (1924) and studies on false consensus effect (e.g., Ross, Greene, & House, 1977; for a revision, see Krueger, 1998), as well as studies on projection of consensus (Marks & Miller, 1987; Holtz & Miller, 1985), assume that the functionality of these mechanisms is based, at least in part, on their role in the validation of knowledge, that is, on the fact that they respond to the individuals' need to perceive social support for their knowledge. As Holtz and Miller (1985) have shown, participants invited to estimate the opinion of their colleagues were afterward more certain about their own opinions than participants who were not given the chance to project their own opinion. Furthermore, meta-analyses on the false consensus effect evidenced that this is a relatively robust effect (e.g., Mullen & Hu, 1988). In fact, and independently of consensus being a result of objective or constructed comparison (Goethals & Klein, 2000), and although there is some controversy on the relevance of comparison others to knowledge validation, it seems that, at least in most situations, the disagreement from others leads to lower confidence in personal opinions (Orive, 1988; Festinger et al., 1952).

Goethals and Darley (1977) and Goethals and Klein (2000) proposed a consistent explanation for the false consensus effect, an effect that occurs when individuals with a given attribute or a given opinion tend to consider that the same attribute or opinion is shared by a higher percentage of persons than in the case of those without the attribute or opinion in question (cf. Spears & Manstead, 1990). The explanation proposed by Goethals and colleagues is based on a framework of an attributional reformulation of the social comparison process. According to these authors, "in general we can more confidently attribute our response to the entity we are judging if other people agree with our proposal. If others disagree, we are more likely to suspect that our belief is person caused and reflects some kind of bias" (Goethals & Klein,

2000, p. 27). This explanation is proposed in the realm of Kelley's (1967) covariation model, where it is contended that consensus allows behavior to be attributed to external causes. But this argument begs another question: is it true that the existence of consensus means that opinions are not biased? In other words is consensus the sole criterion for people to think that their opinions are not biased and not determined by their personal characteristics but by the characteristics of the entity being judged? We contend that group heterogeneity is also seen as an important criterion for everyday knowledge validation.

As Goethals and Klein (2000) state: "if a similar person agrees with us perhaps their agreement reflects the fact that they share the same bias" (p. 27). Or following Kelley's (1967) model, the agreement of another may only mean that the opinion of both individuals can be attributed to personal causes and not to the entity. Accordingly, Wells and Harvey (1977) showed that consensus generates the idea of external causality only when it is perceived as a product of dissimilar individuals. This attribution-based hypothesis can be articulated with one of Asch's (1952) explanations for the prevalence of independent choices in his studies on conformity. According to this author, the perceived independence among those who share knowledge is a critical factor on the value of the consensus that is produced: "the value and dignity of agreement rests on the value and dignity of individual observers and thinkers" (Asch, 1952, p. 493); "if our dependence and trust are to have a solid ground, if we are to reach valid consensus, each must contribute out of his understanding and feeling" (Asch, 1952, p. 450). It is the diversity of each individual's contribution that confers validity on the agreement between all the individuals. Briefly, and according to this argument, the perception of a group as a homogeneous entity can hinder the perception of the validity of the group's knowledge.

Moreover, Reckman and Goethals (1973) and Goethals and Nelson (1973) empirically demonstrated that, at least in certain cases, individuals prefer to compare their own opinions with dissimilar and not with similar others, a result that stresses the importance of heterogeneity per se in social validation of knowledge, that is, individuals tend to search for diverse compari-

son targets independently of the importance that they attribute to a consensual position.

Then the question arises as to whether the heterogeneity principle is used independently of the type of knowledge under validation. Indeed, Goethals and Darley (1977) propose that heterogeneity might be particularly important when a potential verifiable assertion about the attributes of an entity is evaluated (i.e., in Goethals and Darley's assertion a *belief*). Heterogeneity might not be as relevant when the aim is to evaluate "an assertion about the goodness or badness of an entity or a state of affairs" (i.e., in Goethals and Darley's assertion a *value judgment*; Goethals & Nelson, 1973, p.118). As the results of Goethals and Nelson (1973) show, when the case is to evaluate "value judgments," individuals tend to prefer to compare their opinions or evaluations with similar others (and this suggests the importance of homogeneity). However, when the case is to evaluate potentially verifiable propositions, individuals tend to prefer the comparison of their judgments with dissimilar others (which suggests the importance of heterogeneity).

Similar results were obtained by Gorenflo and Crano (1989). These authors showed that in the case of objective judgments participants tended to compare their own judgments with the judgments of dissimilar others, while in the case of subjective judgments they prefer to compare their judgments with similar others. Also, in a more recent study, Augustinova, Drozda-Senkowska, and Lasticova (2004, Studies 1 and 2) showed that the principle of heterogeneity could be applied to "well defined problems," such as the evaluation of the answers given to the most difficult item of Raven's intelligence test. Nevertheless, these results merely shed evidence on the fact that comparison targets are chosen according to the nature of the problem.

Our studies try to enlarge the scope of the heterogeneity principle in the validation of everyday opinions, independently of the perception of validability of these opinions. In fact, Goethals and Darley (1977) consider that "most opinions probably represent a complex mixture of underlying beliefs, basic values, and simple likes and dislikes" (p. 272), that is, everyday knowledge can be seen as potentially validable knowledge. In this same vein, Goethals, Allison, and Frost (1979) showed that in the domain of political opinions, a "preferences and values" do-

main, individuals use the heterogeneity principle. In fact, participants in this study not only overestimate the number of those that share their opinion (the magnitude effect—another designation for projection of consensus or even false consensus effect), but also consider that those who share their opinions are more diverse than those who share opposite opinions (the diversity effect).

These results constitute a first step toward a greater level of support for the heterogeneity principle, showing that it can also be applied to the preferences domain. Nevertheless, Manstead (1982) was only able to replicate this diversity effect in one of four experimental manipulations used to replicate Goethals and colleagues' study. Furthermore, it should be noted that neither the studies of Goethals and colleagues nor Manstead studies manipulated projection target heterogeneity, nor did they use measures of attributed credibility or certainty to the opinions under judgment, two factors that narrow the scope of these empirical researches. Moreover, the measure of variability used in these studies confounds different aspects of variability into a single dimension, such as psychological, sociological, or values heterogeneity of group members.

Therefore, together with other validation principles, we contend that two independent and complementary dimensions help framing the common sense analysis of everyday knowledge validation: (a) the degree of consensus of knowledge on a given object and (b) the heterogeneity of those that share some form of knowledge. Accordingly, "validity" is a characteristic of opinions that are consensually sustained and/or shared by heterogeneous groups (for a review on the multifunctionality of the perception of groups' heterogeneity see, e.g., Devos, Comby, & Dechamps, 1996). But as far as we know, empirical studies have revealed only indirect support for this hypothesis.

The indirect support for the hypothesis that heterogeneity per se can be seen as a principle of knowledge validation is found in three independent lines of research: Wilder's (1977, 1978a, 1978b) studies on social categorization and social influence, Harkins and Petty studies on persuasion (1981, 1987), and Vala, Garcia-Marques, Gouveia-Pereira, and Lopes (1998) and Kelly's (1989) studies on the intergroup differentiation of heterogeneity.

Wilder's studies show that an aggregate, that is, a noncategorized group of individuals, is more influential than a group. Our interpretation of these results is that an external target of influence perceives the group as more psychologically homogeneous and, therefore, less credible, while perceiving the aggregate (the noncategorized group) as more diverse and more credible. In fact, it is conceivable that members of a group become seen as less independent than noncategorized individuals and that, consequently, the attribution of the causes of their beliefs is more probably attributable to internal rather than external causes. Likewise, studies on groups' perceived entitativity (e.g., Lickel et al., 2001) show that the higher the similarity between group members the higher the entitativity, leading, in our opinion, to a lower perception of individuation and, for that reason, to a higher probability of attributing internal causes to groups' beliefs. In general, this explanation is not very different from Wilder's (1990) own explanation of his results: "consensus of group members is judged as less credible because it is thought that their opinions do not reflect solely their separate judgments [. . .]; on the other hand, consensual unrelated individuals may have greater impact precisely because of their apparent independence. In this case, consensus reflects a convergence of opinions drawn by the common external stimulus" (p. 1203).

The other line of research that indirectly supports the heterogeneity hypothesis is illustrated by Harkins and Petty studies' on persuasion (1981, 1987). In these studies the authors showed (a) the same arguments are more efficient when presented by different sources than when presented by a single source (a result that supports the principle of consensus) and (b) the same messages have a lower impact when presented by a committee than when presented by independent or unrelated individuals (a result that supports the principle of heterogeneity). In line with Harkins and Petty's arguments, messages from multiple and independent sources are processed more thoroughly and for this reason are more influential. Accordingly, not only the sources' independence is more salient but also the idea that they represent multiple perspectives is taken into account in message processing.

Finally, Vala et al. (1998) ran three correlational studies showing how political party supporters use groups' variability and consensus to validate their party's positions and to invalidate the positions of an opposing party. In this sense, their results showed that perceived group variability in terms of stereotypes is greater in the ingroup than in the outgroup, but that values are perceived as equally homogeneous in both groups. According to the interpretation of Vala et al., ingroup values are perceived as consensual and sustained by dissimilar individuals. On the contrary, outgroup values are discredited because values' consensuality is backed up by a group composed of highly similar people. Kelly's (1989) studies on the homogeneity of values and stereotypes in British political parties yielded similar results.

These three lines of research contribute only indirectly to the study of social validation of everyday knowledge because they do not include a dependent measure of knowledge validity. Consequently, and although it is possible to find in the literature a consistent array of arguments that favor the hypothesis of the impact of variability of those that share an opinion on its validation, the empirical evidence for this hypothesis is incomplete because in the studies by Reckman and Goethals (1973); Goethals and colleagues (1979); Gorenflo and Crano (1989); Manstead (1982); Kelly (1989), and Vala et al. (1998), consensus and variability of those that share some opinion is measured but not manipulated. In the Goethals and colleagues and Manstead studies measures of variability frequently confound psychological and sociological heterogeneity with heterogeneity in terms of cultural background or social values. Moreover, and although in the studies by Goethals (1972); Goethals and Nelson (1973); Wilder (1977, 1978a, 1978b) and Harkins and Petty (1981, 1987) variability is manipulated, measures of opinion validity are only included in the first two studies. More importantly, none of these studies manipulated consensus and variability simultaneously or measured its impact on participants' attribution of validity to their own or to other individuals' opinions.

None of these studies, except the Vala et al. studies, analyzed the attribution of validity to positions of two opposing groups. In real life, we are often faced with decisions that impose a choice between two situations. We are often led

to validate one position or opinion and invalidate another. When one is faced with a situation where two groups holding opposing positions are described at different levels of consensus and heterogeneity, these informational cues might lead us to attribute greater validity to one group and to downgrade the validity of the other. Using the consensus rule one might attribute greater validity to a more consensual group. On the other hand, using the heterogeneity rule, a more heterogeneous group might deserve more credit than a homogeneous one. But what might happen when the two types of information are combined? Taking the attributional reanalysis of social comparison theory, we can predict that when two groups are depicted as equally consensual, the group presented as more heterogeneous will be credited with greater validity once the agreement between heterogeneous individuals is more easily attributed to reality than the mere agreement between similar or homogeneous individuals (Goethals & Darley, 1977; Goethals & Klein, 2000; Wells & Harvey, 1977). In the last case, a consensual opinion resulting from homogeneous individuals might lead to the perception that this opinion is invalid because the consensus resulted from the agreement among biased individuals (Goethals & Klein, 2000; Vala et al., 1998). Nevertheless, the mere fact of stating that a group is more consensual than another might impair the usefulness of heterogeneity information and render it inapplicable in this situation. Thus, when one is faced with opposing opinions from two groups, and despite the fact that these groups are described at different levels of variability, the perception that one group is more consensual than the other might be sufficient to lead participants to attribute more validity to the former group's position.

Summary of Present Studies

A pilot study and two experimental studies were conducted to test our hypotheses. In the pilot study, we tested our experimental scenario, and the manipulations of consensus and heterogeneity predicting that perceived consensus and perceived variability are both useful knowledge validation principles. Therefore, we predicted that participants would tend to attribute more validity to higher than lower consensus groups (a common result in social psychology empirical research), but more importantly they would also tend to attribute more validity to the positions of heterogeneous rather than homogeneous groups, a result that has received little support in previous research. Our prediction is that consensus and heterogeneity per se should be one of the principles for validating everyday knowledge.

Following the results of the pilot study, we analyzed in Study 1 how these two principles can work together. Based on the attributional reinterpretation of social comparison processes proposed by Goethals and Darley (1977) and Goethals and Klein (2000), we tested the hypothesis that the consensus principle is moderated by heterogeneity—the heterogeneity moderation hypothesis. This hypothesis predicts that when two groups are described as having equal (and high) consensus, participants will tend to attribute greater validity to the more heterogeneous group, a hypothesis that matches Goethals and Darley contentions. However, when one group is described as more consensual than the other, participants will not distinguish between homogeneous or heterogeneous groups, showing that a discrepancy in groups' consensus might be sufficient to downgrade variability information and be sufficiently powerful to lead participants' to attribute greater validity to the more consensual group independently of their characterization of heterogeneity or homogeneity.

In Study 2, we aimed at a replication of the results of Study 1 using a new scenario and a different manipulation of group variability.

In all studies consensus and variability were manipulated. In the pilot study and in Study 1, psychological variability (similarity or dissimilarity of group members in terms of personality traits) was manipulated; in Study 2 we manipulated variability in terms of groups' sociological characteristics (the majors that group members followed). In all studies, opinions under validation are supported by groups to which participants do not belong. The dependent variable was, in all studies, the validity participants attributed to the positions held by the groups described in the proposed scenarios.

The experimental procedure was the same in all studies. Briefly, participants read information about two task groups with opposing views concerning the same situation; using a between-

subjects design, these groups varied in terms of their variability and consensus. Based on the information given about the groups, participants (external observers of these group decision scenarios) had to evaluate the degree of validity of each group's position. Minimal information about the positions was given in order to ensure that participants would focus their attention more on group composition and group consensus, and not on the topic under validation itself. Also, because such information was not supplied, we did not expect that participants would identify with the groups.

Pilot Study

Design and Overview

The design of this pilot study was a one factor between-participants design with four levels (equal consensus in both groups, higher consensus in one group than in the other, equal variability in both groups, higher variability in one group and homogeneity in the other). In the equal consensus/equal variability conditions we expected that participants would attribute the same degree of validity to each of the groups' opinions depicted in the scenario.

As referred to previously, participants had to evaluate the ideas of two opposing groups that were discussing a new model of local administration. These groups were described in terms of the consensus of each group concerning the opinions they held or according to their internal composition, that is, the psychological heterogeneity of its members manipulated in terms of the similarity versus dissimilarity of their general personality traits. Information describing the two groups was presented in a separate way: half of the participants received information concerning characterization of the groups in terms of the consensus supporting each group's opinion; the other half received groups' characterization in terms of their psychological heterogeneity. This strategy aimed at replicating a consensus effect, that is, a more consensual opinion is invested with greater validity than a less consensual one; but also, and more importantly, it sought to test the hypothesis that the simple fact of describing a group as heterogeneous is sufficient to invest this group's opinion with greater validity, when contrasted with a

group characterized as homogeneous to the same extent.

Method

Participants

Eighty-six undergraduate students participated voluntarily in this study, 56 were psychology undergraduates, 13 were sociology undergraduates, and 17 were computer sciences undergraduates.

Procedure and Materials

This study was run in classroom groups (about 20 students), and each participant completed a questionnaire individually. Participants were randomly assigned to one of the conditions of the design, and each one received a booklet consisting of three pages: page 1 gave general instructions, and pages 2 and 3 presented all independent and dependent variables. General instructions were read out loud, and participants were asked to read attentively all the information presented in the questionnaire, as well as to answer all questions thoroughly.

Participants were told that they were going to participate in a study about decision-making processes in a social context. Thus, they read a text describing a meeting of a city council: two groups of individuals (referred to in the scenario as "Group A" and "Group B") participating in this meeting discussed a new model of local administration. Group A and Group B had opposing positions about the new model of administration, and no specific detail was given regarding the content of the positions of each group. After reading the text, participants rated the validity of each group's position. At the end of each session, participants were debriefed and thanked.

Independent Variables

Group A and Group B were described according to two characteristics: the degree of consensus in the positions sustained by its members or the groups' internal composition in terms of the psychological variability of its members (i.e., members were described as being similar or dissimilar regarding their general

personality traits). Group labels "A" and "B" were counterbalanced.

Group characterization in terms of consensus. Participants in the "higher consensus in one group than in the other" condition read:

> (...) about 65% of members of Group A agree with the position that is held by their group. About 95% of members of Group B agree with the position that is held by their group. The degree of consensus is thus different in each group.

In the "equal consensus in both groups" condition participants could read:

> (...) in both groups about 80% of members agree with the position that is held by their group. The degree of consensus is thus equal in Group A and in Group B.

Group characterization in terms of variability. The variability manipulation introduced in the text sought to create the impression that members of each group were all alike or all different in terms of general personality traits. Thus, in the "higher variability in one group than in the other" condition participants read:

> (...) Group A is composed of people that are very similar to each other in terms of their personality, while Group B is composed of people that are very dissimilar from each other in terms of their personality. That is, Group A is a homogeneous group—this group is composed of members that are very similar to each other. Group B is a heterogeneous group—this group is composed of members that are very dissimilar from each other.

In the "equal variability in both groups" condition groups were characterized as being composed of dissimilar members in terms of their personality traits (both groups heterogeneous):

> (...) Group A and Group B are both composed of people that are very dissimilar from each other in terms of their personality. That is, Group A and Group B are heterogeneous groups—these groups are composed of members that are very dissimilar from each other.

Alternatively, groups were characterized as being composed of similar members in terms of their personality traits (both groups homogeneous):

> (...) Group A and Group B are both composed of people that are very similar to each other in terms of their personality. That is, Group A and Group B are both homogeneous groups—these groups are composed of members that are very similar to each other.

Dependent Variables

In order to evaluate the position of each group, participants answered two different questions: "What is the degree of certainty that members of Group A/B have in the ideas that they sustain?" (1 [*a low certainty*], 5 [*a moderate certainty*], 9 [*a high certainty*]); "What is the credibility that you personally attribute to Group A/B ideas?" (1 [*a low credibility*], 5 [*a moderate credibility*], 9 [*a high credibility*]). These two questions were presented on separate sheets of the booklet handed out to participants. In each of these sheets, the text showing the manipulation of independent variables was repeated. This strategy was aimed at increasing the attention of participants toward the information included in the text.

Results and Discussion

In order to test whether group labels had an effect on results, we ran one-way analyses of variance (ANOVAs) with "group labels" (B being the group with a more "favored" characterization vs. "A" being the group with a more "favored" characterization) as an independent variable. The dependent variables used in these analyses were the levels of certainty and credibility that participants attributed to each group's position. The results confirm the absence of an effect of group labels.

Likewise, we checked participants' attribution of validity to both groups' positions in the conditions where the groups were depicted as equal. We calculated an index of validity attribution for each group with the two dependent measures described above. The correlation between these two measures shows that they form reliable indexes, $r_{Group\ A} = .64$, $p = .004$; $r_{Group\ B} = .71$, $p = .001$. Paired-samples t tests evidenced that participants attributed equal validity to both groups positions under the conditions "equal consensus" and "equal variability," respectively $t(21) = .00$, ns ($M_{Group\ A} = 6.36$, $SD_{Group\ A} = .98$, $M_{Group\ B} = 6.37$, $SD_{Group\ B} = .95$) and $t(26) = -1.16$, ns ($M_{Group\ A} = 5.57$, $SD_{Group\ A} = 1.41$, $M_{Group\ B} = 5.70$, $SD_{Group\ B} = 1.33$). Therefore, we maintain that participants understood our scenario and that the task proposed did not generally raise any comprehension difficulties.

One of our hypotheses was aimed at replicating the classic effect of consensual influence: the opinions of a group with higher consensus will be credited with greater validity, when compared with a group with lower consensus.

This hypothesis was tested with a paired-samples *t* test, showing that compared to Group A, participants attributed greater validity to Group B's opinion, that is, the group that held its position with higher consensus, $t(19) = -7.43$, $p = .000$ ($M_{\text{Group A}} = 5.05$, $SD_{\text{Group A}} = 1.33$, $M_{\text{Group B}} = 7.13$, $SD_{\text{Group B}} = 1.45$).

Our heterogeneity hypothesis was tested in the same way, that is, we checked if participants attributed greater validity to Group B opinion when it was depicted as heterogeneous, contrasting with the attribution of validity to Group A (the homogeneous group). The paired-samples *t* test confirmed our prediction that participants' validity attribution was greater to Group B than to Group A, $t(16) = -2.75$, $p = .01$ ($M_{\text{Group A}} = 4.68$, $SD_{\text{Group A}} = 1.93$, $M_{\text{Group B}} = 6.50$, $SD_{\text{Group B}} = 1.89$). Therefore, parallel with consensus, we were able to show that characterizing a group as heterogeneous results in a similar pattern of validity attribution as the one obtained (and largely expected) with consensus.

Consequently, presenting participants with information about consensus or heterogeneity does lead them to attribute more validity to the position held by the group that is depicted as the more consensual or as the more heterogeneous.

Study 1

Overview and Design

In the pilot study we evidenced that our experimental scenario did not raise any major comprehension difficulties for participants, and also that not only consensus but more importantly heterogeneity per se can be conceived as a principle for validation of everyday opinions. However, the pilot study does not allow us to understand how these two principles can work together, for instance probing into how each principle can affect the other and assessing their joint impact on social validation of everyday knowledge.

In order to overcome this problem, we ran a new study with a similar procedure but with a different design. As in the pilot study, participants had to evaluate the positions of two opposing groups that were discussing a new model of local administration. These groups were described in terms of the consensus concerning the positions sustained by its members, and also

according to their internal composition, that is, the psychological heterogeneity or homogeneity of its members was manipulated in terms of the similarity versus dissimilarity of their personality traits. In this study, each participant received both types of group characterization information. The design of the study was a 2 (equal consensus in both groups vs. higher consensus in one group than in the other) × 2 (equal variability [homogeneity or heterogeneity] in both groups vs. greater variability in one group than in the other) between subjects' factorial design.

We expected variability to moderate the consensus effect. This moderation hypothesis predicts that when two groups are described as having equal (and high) consensus, participants will tend to attribute greater validity to the more heterogeneous group. However, when one group is described as more consensual than the other, heterogeneity will not contribute to the validation of groups' opinions and participants will simply attribute more validity to the more consensual group disregarding heterogeneity information.

In line with the results of our pilot study, we might also expect the main effects of consensus and variability to be such that when a group is presented as more consensual than another, this group will be invested with greater validity, while participants will not make any differentiation in terms of attributed validity when the two groups are described as equally consensual. Similarly, participants will attribute more validity to the positions of a group that is more heterogeneous, while not differentiating two groups that are presented as equally variable.

Method

Participants

Two hundred undergraduate students participated voluntarily in this study. Sixty-eight were psychology undergraduates, and 132 were management undergraduates.

Procedure and Materials

The procedure in this study and the scenario presented to participants were the same as the ones used in the pilot study. This study was run in classroom groups (about 20 students). Partic-

ipants were randomly assigned to one of the conditions of the design, and each one completed a questionnaire individually. General instructions were read out loud, and participants were asked to read attentively all the information presented in the questionnaire, as well as to answer all questions thoroughly.

As in the pilot study, they were told that they were going to participate in a study about decision making processes in a social context. The text presented to participants described a meeting in a city council where two groups of individuals discussed a new model of local administration ("Group A" and "Group B"). The groups had opposing positions concerning the new model, and no specific details were given regarding the content of the positions of each group. After reading the text, participants rated the validity of each group's position. At the end of each session, participants were debriefed and thanked.

Independent Variables

The independent variables were the same as the ones of the previous study, but this time information on groups' consensus and variability was presented simultaneously (while in the pilot-study half of the participants received consensus information, while the other half received variability information). The order of presentation of these variables was controlled.

Dependent Variables

This study used the same dependent variables as the pilot study, but we added a new dependent variable, that is, we asked participants whether they were "in favor of Group A/B ideas" with a high or low certainty (1 [*with low certainty*], 5 [*with a moderate certainty*], 9 [*with high certainty*]).

For the sake of simplicity of statistical procedures, we used the three variables to compute an index of validity, calculating the difference between the validity attributed to Group B and that attributed to Group A (perceived certainty, attributed credibility and favoritism; see description above). The scale of this index ranges from -8 (*lowest validity attributed to Group B*) to $+8$ (*highest validity attributed to Group B*), with 0 indicating "equal validity attributed to Groups A and B." The measures that compose

this difference index reveal a reasonable internal consistency ($\alpha = .63$).

Results and Discussion

To test whether the order of presentation of consensus and heterogeneity information affected our results, we ran several one-way ANOVAs with "presentation of information" (consensus first and variability second vs. variability first and consensus second) as independent variable. The dependent variables used in these analyses were the levels of certainty, credibility, and favoritism that participants attributed to each group. The results confirm the absence of an order effect on the order of presentation of consensus and variability information.

The "equal variability in both groups" manipulation presented to participants comprised one manipulation, where both groups were presented as heterogeneous and another where both groups were presented as homogeneous. The results of an ANOVA run over these conditions did not reveal any significant differences in the attribution of validity by participants.

In order to analyze our hypotheses, different logistic regression models were run. This strategy was adopted when our data did not follow the homogeneity of variances assumption and more specifically when a high correlation between means and variances/standard deviation across the cells of the design was verified.[1] Both findings violate the critical assumptions of conventional ANOVA models (Wilcox, 1987a, 1987b); therefore, we ran logistic regressions to test our hypotheses using the median scores of validity attribution to Groups A and B.[2] This nonparametric test is a highly robust procedure that is not dependent on the assumptions required by ANOVA models.

In the logistic regressions our dependent variable (validity scores above and below the median: 1 [*above the median*], 0 [*below the me-*

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[1] This violation of the homogeneity of variances assumption was also verified in study 2. The correlation between means and standard deviations across cells of the design were: study 1, $r = .70$; study 2, $r = .80$. No such violation of this ANOVA assumption was verified in the pilot study, $r = .00$.

[2] A word of appreciation is due to Charles Judd for having suggested the use of this procedure in the analyses of our data.

dian]) was regressed on the predictor variables. Values above the median indicate greater validity attributed to Group B's position, and values below the median show greater attribution of validity to Group A's position. In turn, our predictor variables were contrast coded so that we could analyze the interaction effect previewed by our moderation hypothesis.

The use of contrast coding of the predictor variables allows the comparison of the logistic regression empty model with a model with one predictor (consensus or variability). In fact, if the model with the predictors proves to raise the explanation of the empty model, then the predictors clearly influence the dependent variable (Judd & McClelland, 1989).

In this sense, consensus and variability main effects were coded in the following way: the condition "equal consensus in both groups" was coded "-1" and the condition "higher consensus in one group than in the other" was coded "1"; the condition "equal variability in both groups" was coded "-1" and "higher variability in one group than in the other" was coded "1." In order to test our moderation hypothesis, an interaction term between consensus and variability was computed by multiplying the contrast coding of consensus and variability main effects. The conditions of the design were coded in the following way: the condition "equal consensus in both groups/higher variability in one group than in the other" was coded "1" and "equal consensus/ equal variability in both groups" coded "-1"; also, the condition "higher consensus in one group than in the other/higher variability in one group than in the other" condition was coded as "-1" and the condition "higher consensus in one group than in the other/equal variability in both groups" coded as "1."

Let us look first at the number of participants below and above the median by levels of con-

sensus and variability. Table 1 shows that there are more participants with validity scores below the sample median in the equal consensus condition ($n = 79$) than above the median ($n = 28$), while the inverse is observed in the higher consensus in one group condition where there are more participants with validity scores above the sample median ($n = 72$) when compared to the number of participants with validity scores below the sample median ($n = 21$).

When groups are presented as equally diverse, there are more participants with validity scores below than above the median ($n = 74$ vs. $n = 45$); on the contrary, in the condition where Group B is depicted as more heterogeneous the number of participants with scores above the median is higher than the number of participants with scores below the median ($n = 55$ vs. $n = 26$), showing that in this condition participants attributed more validity to Group B than to Group A.

To test the moderation hypothesis, three predictors were entered into a hierarchical logistic regression equation: the contrast coded consensus and variability "main effects" and the contrast coded interaction between consensus and variability, allowing the analysis of the "interaction effect" controlling for the two main effects. Table 2 presents the results of this logistic regression, showing that both the interaction effect and the main effects significantly predict the validity which participants attributed to both groups and increases the explanation of the empty model when compared to the compact model, $\chi^2(3, N = 200) = 103.83$, $p < .000$, Nagelkerke $R^2 = .55$.

Our moderation hypothesis points to an interaction effect between the rules of consensus and variability on the validity of groups' positions. The logistic regression results show that the interaction effect significantly predicted the

Table 1
Number of Participants by Levels of Consensus and Variability

	Consensus			Variability		
	EC Both groups	HC in one group	Total	EV in both groups	HV in one group	Total
Participants > Mdn	28	72	100	45	55	100
Participants ≤ Mdn	79	21	100	74	26	100
Total	107	93	200	119	81	200

Note. Mdn = median; EC = equal consensus; HC = higher consensus; EV = equal variability; HV = higher variability; Consensus sample median = 0.50; Variability sample median = 0.50.

Table 2
Results of Hierarchical Logistic Regression Analyses for Validity Attributed to the Positions of Groups A and B

	β	Exp β	95% CI for Exp β	Wald test (*df*)	Significance
Empty model	0.03	1.03	—	0.05 (1)	0.83
Moderation hypothesis					
Consensus	1.24	3.44	(2.27, 5.22)	33.75 (1)	0.000
Variability	0.84	2.33	(1.53, 3.53)	15.78 (1)	0.000
Consensus × variability	1.01	2.76	(1.82, 4.18)	22.69 (1)	0.000

Note. Exp β = *logit* conversion into odd ratios; CI = confidence interval; *df* = degrees of freedom.

attribution of validity to groups' positions, Exp β = 2.76, *p* < .000. In fact, the positive odds ratio indicates that participants were more prone to attribute validity to the Group B position when this group was depicted as equally consensual as Group A but as more heterogeneous than Group A, while in the conditions where Group B was presented as more consensual than Group A their characterization in terms of variability did not have the same impact on validity attribution. In this last case, participants attributed more validity to the more consensual group irrespective of heterogeneity information.

This last result supports our moderation hypothesis, suggesting that when consensus and heterogeneity information are presented together participants tended to use variability information depending on the type of consensus information they received. Thus, when two groups are depicted as equally consensual, participants will rely on variability information in order to decide on the attribution of validity to the more consensual group. Nevertheless, when one group is depicted as more consensual than the other the utility of variability information is demoted and participants seem to rely only on consensus information to attribute more validity to the more consensual group.

Additionally, and following our pilot study results, the main effects of consensus and variability significantly predicted variability attribution to both groups. In this sense, the consensus effect shows that the odds of a participant in the condition "higher consensus in one group than in the other" attributing greater validity to Group B's position is 3.44 times the odds of a participant in "equal consensus in both groups" condition attributing a similar validity to Group B. Similarly, the variability main effect shows that the odds of a participant in the condition

"higher variability in one group than in the other" attributing greater validity to Group B's position is 2.33 times the odds of a participant in "equal variability in both groups" condition attributing a similar validity to Group B.

Study 2

Overview and Design

In this second study we aimed at a replication of our previous results, changing the context, dimension, and manipulation of groups' variability. Once again, we are hypothesising that consensus information will be moderated by variability information in such a way that in a situation where two opposing group are described as equally consensual in the positions that they hold, participants will attribute more validity to the more heterogeneous group. However, when one of these groups is presented as more consensual than the other variability information will not induce any effect on participants' attribution of validity to the groups. In this case, participants will attribute more validity to the more consensual group.

In this new study, the setting we presented to participants was a scenario that would not only be more realistic for them (choosing a logo for a students union), but also closer to their usual social environment (the university). Concerning groups' variability, this study used a manipulation of sociological variability, that is, group members were characterized according to the majors they were following, and not in relation to their personality traits. Thus, the presentation of heterogeneity information was modified and reinforced through the presentation of the percentages of members that had a specific socio-

logical characteristic. The design and hypothesis of this study were the same as for Study 1.

Method

Participants and Procedure

Two hundred and twelve undergraduate psychology students participated voluntarily in this study. This study's procedure was equal to the previous ones.

Materials

The scenario presented to the participants at the beginning of the questionnaire asked them to imagine a situation where university students belonging to a students' union were gathered in a meeting to choose a new logo for this union. They were also told that the students participating in this meeting formed two groups referred to as "Group A" and "Group B" with opposing positions concerning this new logo. No specific information was given regarding this logo, nor was it graphically presented to participants.

Independent Variables

As in Study 1, the groups of students that participated in the discussion about the new students union' logo were described according to the same two characteristics: their degree of consensus concerning the positions that they sustained, and their internal composition in terms of the sociological variability of group' members (specifically, members were described as following different majors or the same major).

Group characterization in terms of variability. The variability manipulation we introduced in the text described the groups as being composed of similar or dissimilar members according to a sociological dimension: the major that they were following. Accordingly, in the "higher variability in one group than on the other/equal consensus in both groups" condition participants learned that Group A was 100% composed of undergraduate students following a physics major (or a biology major or a geology major), while Group B was composed of approximately 35% of physics undergraduate students, 32% of biology undergraduate students, and 33% of geology undergraduate students. Moreover, it was stressed out that Group A was a homogeneous group; that is, students that composed this group all followed the same major, and Group B was a diverse group; that is, students that composed this group had chosen different majors.

Consensus manipulation was the same as the one used in previous studies.

Dependent Variables

The dependent variables used in this study were the same as in the previous one. As in Study 1, the same index of validity was computed by calculating the difference between the validity attributed to Group B and the validity attributed to Group A. The internal reliability of the three scales proved to be acceptable (α = .62).

Results and Discussion

We first ran several one-way ANOVAs in order to test if participants attributed different levels of validity depending on the majors depicted in the scenario. These analyses did not show significant variation between groups characterized by students following different majors and, consequently, did not significantly influence participants' attribution of validity to groups' positions.

In this study, we used the same strategy of data analyses used in the previous study. Both dependent and independent variables coding followed the rules used in the previous study. As in Study 1, the dependent variable used in this study represents the median split of the validity scores attributed to Groups A and B. To test the moderation hypothesis, we run a hierarchical logistic regression entering consensus, variability, and the interaction between consensus and variability into the same regression. This analysis allows us to verify if the interaction effect predicts the attribution of validity to both groups, controlling for the main effects of each one of the knowledge validation rules.

Table 3 shows the number of participants attributing validity to Groups A and B below and above the median. Note that scores above the median represent higher attribution of validity to Group B, while scores below the median represent equal attribution of validity to both groups or higher attribution of validity to

Table 3
Number of Participants by Levels of Consensus and Variability

	Consensus			Variability		
	EC in both groups	HC in one group	Total	EV in both groups	HV in one group	Total
Participants > Mdn	25	78	103	47	56	103
Participants ≤ Mdn	80	29	109	73	36	109
Total	105	107	212	120	92	212

Note. Mdn = median; EC = equal consensus; HC = higher consensus; EV = equal variability; HV = higher variability; overall sample median = 0.33.

Group A. As Table 3 shows, there are more participants with validity scores below than above the median in the equal consensus condition ($n = 80$ vs. $n = 25$), while there are more participants above than below the median in the higher consensus in one group ($n = 78$ vs. $n = 29$), showing that in this case participants attributed more validity to Group B.

In this same table, a similar pattern can be observed for variability. Indeed, there are more participants with validity scores above the median in the condition where Group B was depicted as having more variability than Group A ($n = 56$ vs. $n = 36$), while there are more participants below the median in the condition where both groups were depicted as equally diverse.

The results concerning the hierarchical logistic regression run to test our moderation hypothesis are presented in Table 4. According to this hypothesis, we expect that participants will use the heterogeneity information to attribute more validity to the positions of groups especially in the case where there are no real differences in consensus between them. The positive odd ratio of the interaction predictor indicates that participants tended to attribute more validity to Group B when this group was depicted as equally consensual as Group A but as more heteroge-

neous than Group A, while in the conditions where Group B was presented as more consensual than Group A their characterization in terms of variability did not have the same impact on validity attribution; that is, participants disregarded this type of information and attributed more validity to the more consensual group, Exp $\beta = 2.05$, $p < .000$. This result supports our moderation hypothesis.

In addition, the hierarchical logistic regression results also showed that the consensus and variability "main effects" significantly predict participants' attribution of validity to both groups. In this sense, the odds ratio statistic for the consensus effect on the dependent variable shows that the odds of a participants in the condition "higher consensus in one group than in the other" attributing greater validity to Group B's position is 3.64 times the odds of a participant in "equal consensus in both groups" condition of attributing a similar validity to Group B. A similar pattern was obtained for the variability main effect on participants attribution of validity to groups' positions: the odds of a participant in the condition "higher variability in one group than in the other" attributing greater validity to Group B's position is 1.60 times the odds of a participant in "equal vari-

Table 4
Results of Hierarchical Logistic Regression Analyses for Validity Attributed to the Positions of Groups A and B

	β	Exp β	95% CI for Exp β	Wald (*df*)	Significance
Empty model	0.13	1.14	—	0.92 (1)	0.34
Moderation hypothesis					
Consensus	1.34	3.82	(2.65, 5.52)	51.10 (1)	0.000
Variability	0.54	1.71	(1.19, 2.48)	8.25 (1)	0.004
Consensus × Variability	0.72	2.05	(1.42, 2.92)	14.72 (1)	0.000

Note. Exp β = *logit* conversion into odd ratios; CI = confidence interval; *df* = degrees of freedom.

ability in both groups" condition of attributing a similar validity to Group B.

In sum, once again our results replicate the ones obtained in previous studies, this time changing the setting and changing the manipulation of heterogeneity—the sociological heterogeneity of group members (different majors that participants followed) and not their variability characterization in terms of personality traits. Thus, the application of the consensus and heterogeneity principles was shown once again to contribute to validate the positions of a group, especially when these two principles are presented together and even when the manipulation of variability is substantially modified.

General Discussion

The present studies illustrate the importance of heterogeneity and consensus in the process of attributing validity to a group's opinion. In fact, our studies showed that heterogeneity plays a moderating role on consensus, that is, under conditions where two groups are presented as having equal (and high) consensus, participants tend to attribute greater validity to the group that is presented as more heterogeneous. However, when one group is presented as more consensual than the other, heterogeneity does not contribute to the validation of groups' opinions, a result that, to our knowledge, has never been before shown experimentally. Furthermore, our pilot study showed that when consensus and heterogeneity information is presented separately, participants consistently attributed more validity to a consensual source, a result that is not new in the literature, but also attributed more validity to a heterogeneous source. The latter results were also obtained in studies 1 and 2.

As previously stated, published experimental and correlational research and that directly or indirectly supports our hypotheses did not manipulate consensus and variability simultaneously, and did not measure its joint impact on attributed validity to a specific form of knowledge. Our studies manipulated consensus and variability, and we tested the hypothesis that heterogeneity moderates the consensus effect. The results of Study 1 support the heterogeneity moderation hypothesis. In Study 2, this result was replicated with a new manipulation of variability and a new scenario. These results support the attributional reinterpretation of social comparison theory proposed by Goethals and Darley (1977; Goethals & Klein, 2000), and partially support the Vala et al. (1998) interpretation of the intergroup differentiation of heterogeneity. In fact, a position held by a consensual and homogeneous group is invested with lower validity than a position held by a consensual heterogeneous group, given that in this last case the agreement between heterogeneous individuals is more easily attributed to the topic under discussion (the entity) and not to some sort of bias shared by individuals—an explanation that fits better in the case of agreement between homogeneous individuals.

However, this moderation hypothesis also points to the fact that when groups are presented at different levels of consensus, that is, when one group holds its position with higher consensus than another, the information concerning variability is disregarded. In this case, consensus information is used as a sufficient condition for differentiating groups in terms of the perceived validity of their positions. We can speculate that in this specific situation consensus information possesses such high salience that it overshadows the role of heterogeneity. Future studies could analyze the conditions under which consensus salience might be lowered and attention to heterogeneity information increased, namely by increasing the attentional state or some sort of epistemic motivation (Kruglanski & Mayseless, 1987) in participants.

In the pilot study we also showed that when presenting consensus and variability information separately, participants tended to attribute greater validity to the position of a more consensual group or to the position of a heterogeneous group. These results were replicated in Study 1 and Study 2. The simple effects of consensus and heterogeneity lead us to admit that participants are inferring that the heterogeneous group generally gives the impression of pluralism in group composition and allows for more member participation, which in turn leads to the attribution of greater validity to the position that this group sustains. This argument is consistent with the conclusions drawn from the studies of Wilder on social influence and perceived independence (1978a, 1978b, 1990), and with the Harkins and Petty studies on the multiple source effects on persuasion (1981, 1987).

These results can be taken as a contribution toward an understanding of the processes of social validation of everyday opinions, specifically when symmetrical contexts are at stake. In fact, social psychology has shown that in asymmetrical contexts it is the use of technical, referent or legitimate power that supports validation of everyday knowledge. Furthermore, it has been shown that in symmetrical contexts consensus is a critical factor in the validation of everyday opinions (for a review, see Krueger, 1998). Briefly, our results show that in symmetrical contexts sociological or psychological heterogeneity can be taken in numerous situations as a principle of validity attribution to everyday knowledge and is especially powerful when added with consensus information. Heterogeneity may be used as an information cue to reduce uncertainty concerning our own or other's knowledge, allowing the separation of what seems to be wrong from what seems to be right, that is, (re)introducing a sense of validity concerning knowledge that people posses or that they perceive other people to possess. By manipulating consensus and heterogeneity simultaneously and also by measuring its effects on attributed validity, our results contribute toward solving the inconsistencies between previous experimental or correlational studies that attempted to show the importance of diversity (e.g., Goethals et al., 1979; Manstead, 1982).

There are several theoretical frameworks within social psychology that accentuate the role of social interaction in the construction of everyday knowledge, as well as the importance for thought and action that is attributed to the perceived sharedness of knowledge (Jost, Kruglanski, & Nelson, 1998; Moscovici & Doise, 1994; Doise, 1990; Hardin & Higgins, 1996; Levine & Moreland, 1999). But is it only the simple fact that any given knowledge perceived as shared by other individuals that triggers the feeling that it is valid? What kind of beliefs or metacognitive beliefs (Jost et al., 1998), or in Moscovici's (1976) terms, what kind of norms or logical rules does the metacognitive system creates on how the cognitive system should work in order to produce valid knowledge? For instance, Leyens, Yzerbyt, and Schadron (1992; Caetano, Leyens, & Vala, 2001) proposed that the norm of social judgeability defines what is and what is not a valid judgment. According to this norm, a judgment

is valid when people feel that they have the necessary information to judge. In this same vein, our results suggest that the heterogeneity of those who share a given opinion is an important cue for people to infer the validity of this opinion. Heterogeneity can be a principle that possesses its own value, independent of that possessed by the consensual sharing of knowledge.

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