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# Compensation Versus Halo: The Unique Relations Between the Fundamental Dimensions of Social Judgment

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*Recent work on the relations between the two dimensions of social judgment, that is, warmth and competence, evidenced compensation such that a group seen more positively than another group on one dimension is seen less positively on the second. The authors examine the status of this compensatory relation by introducing a third dimension in the judgment context. Experiment 1 extends earlier work in a different population, comparing compensation as a function of whether warmth or competence is manipulated and competence or warmth is the unmanipulated dimension. Experiments 2 and 3 use healthiness as the unmanipulated dimension and reveal the presence of halo rather than compensation between warmth or competence on one hand and healthiness on the other. These findings suggest that compensation may not only stem from a concern for distributive justice but may also derive from the unique structural and functional relations between the two fundamental dimensions of social judgment.*

**Keywords:** *stereotypes; compensation; halo; warmth; competence; justice*

For more than half a century, social psychologists have studied the processes involved in making social judgments as well as the content of those judgments. Process questions include the following: What sorts of information do people attend to when forming impressions of others? What influences whether group stereotypes are used? Questions about the content concern the important attributes underlying

social judgments and how those attributes are organized. Are there only a few major dimensions along which social objects vary that really matter? Or are there many different relevant attributes?

Although content questions have not been asked as frequently as process-oriented questions, there seem to be some important regularities to the answers given to them. Regardless of whether the objects of judgment are individuals or groups, two fundamental underlying dimensions seem to emerge. Following Fiske, Cuddy, Glick, and Xu (2002), we call them warmth and competence. Recent correlational (Yzerbyt, Provost, & Corneille, 2005) and experimental work (Judd, James-Hawkins, Yzerbyt, & Kashima, 2005) provides evidence that social perception is often characterized by a compensatory relation between warmth and competence. That is, there is a tendency to perceive one group as warm and incompetent and the other group as competent and cold. The present work examines

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whether the compensation effect characterizing these two dimensions is somehow specific or whether this pattern emerges for any two dimensions used to judge social targets. Do people compensate on any two dimensions that are available, or is it only true for the dimensions of warmth and competence?

As regards personality trait dimensions along which individuals are judged to vary, a long line of work suggests that there are two underlying and fundamental dimensions (e.g., Rosenberg, Nelson, & Vivekananthan, 1968; see Abele & Wojciszke, 2007; Judd et al., 2005). One differentiates personality traits such as intelligent, competent, and determined from traits such as foolish, irresponsible, and lazy. The issue is thus whether a person is likely, and striving, to achieve status and respect. The other dimension differentiates traits such as warm, sociable, and trustworthy, at one end, from traits such as cold, inconsiderate, and dishonest, at the other. Here, the question is essentially whether the person is ready to cooperate and has a sense of obligation. Although various labels have been used, there is great agreement that one dimension makes reference to attributes having to do with intellectual and motivational qualities whereas the other makes reference to more social and moral qualities.

In a similar vein, recent work on the content of group stereotypes has suggested that there are two fundamental dimensions along which groups are judged to differ (Phalet & Poppe, 1997). Fiske and colleagues (2002) have given the labels of competence and warmth to these dimensions and suggested that stereotypes about social groups are distributed in all four quadrants formed by crossing competence and warmth. So whereas some groups are seen as competent and warm (mostly ingroups or groups one aspires to), others are seen as incompetent and cold (outgroups or deprecated groups), and still others fall in the mixed- stereotypes quadrants. As illustrations of the latter, business executives are commonly seen as competent but cold, and housewives are frequently perceived as warm but not terribly competent.

What is remarkable is that the same two fundamental dimensions, albeit with slightly different labels, seem to emerge regardless of the object of social judgment. Individuals, social groups, and even entire nations are judged to vary fundamentally in the degree to which they are agentic and achievement oriented (versus not) and in the degree to which they are communal and valuing social bonds (versus not). The ubiquity of these two dimensions in social judgment suggests that not only is human judgmental language oriented around these two dimensions but also these dimensions may provide important information for the regulation of social interactions.

We consider warmth and competence to be fundamental dimensions for three reasons. First, Rosenberg et al.'s (1968) work shows that these dimensions account for most of the differences between personality traits. Not surprisingly, these two dimensions have been shown to underlie personality models such as the circumplex model (Leary, 1957; Wiggins, 1982) and the Big Five model (Digman, 1997; Wiggins, 1991). Furthermore, research by Peeters (2002) suggests that competence and warmth can be seen as functionally distinct. Whereas competence traits mainly benefit their holder, warmth traits would seem more critical for people interacting with their holder. Second, in the context of their stereotype content model, Fiske et al. (2002) have argued convincingly that these dimensions relate directly to key structural aspects that shape intergroup relations, namely, differences in status and degree of cooperation. Whereas differences in status are reflected in attributions of competence, the cooperative or competitive nature of the relations translates into perceptions of warmth. Finally, not only has support for those two dimensions been found across domains, but Cuddy and colleagues (Cuddy, Fiske, & Glick, 2007) have also shown that these same dimensions differentiate stereotype content across a variety of cultures.

#### RELATION BETWEEN COMPETENCE AND WARMTH

Given the importance of these two dimensions, an important question is whether and how they are related. Do we think that others who are warm toward us are also capable of benefiting us? Or are those who would harm us more likely to be seen as having the ability to do so? The literature on this question is rather mixed and seems to depend on the object of social judgment.

In the work on impressions of individual persons, Rosenberg and colleagues (1968) reported a substantial positive correlation between the two dimensions. If we judge someone as relatively friendly, we also tend to see this person as relatively competent. This positive correlation has been labeled a halo effect, in that good attributes along one dimension are assumed to go with good ones along the other. The literature on group perception makes a rather different suggestion. In the judgment of outgroups (i.e., groups that one does not belong to), Fiske and colleagues (2002) have suggested that many groups may be judged positively on one dimension but negatively on the other. That is, although some stereotyped groups are judged negatively on both (e.g., welfare recipients), many group stereotypes are of a rather mixed nature, either competent but cold (e.g., business executives or feminists) or warm but ineffectual (e.g., housewives and elderly people).

Although these differences in the relation between the two dimensions in different domains are intriguing, the existing research has been largely descriptive, examining how judgments on the two dimensions covary (for a review, see Fiske, Cuddy, & Glick, 2007) rather than systematically exploring the factors responsible for their relationship. In one of the few studies examining these two dimensions that relied on a full ingroup–outgroup design, Yzerbyt et al. (2005) asked French and Belgian respondents to indicate how they perceived their own and the other group in terms of linguistic skills as well as, more important, in terms of competence and warmth. The data strongly supported a compensation hypothesis in that both groups of respondents described one of the two groups as more competent than warm and the other of the two groups as less competent than warm.

Turning to a more controlled setting, Cuddy, Fiske, and Glick (2004) had their participants examine individual profiles in the context of a personnel evaluation procedure. Among three filler profiles of management consultants was a profile that varied in gender and in whether the professional person had a child. These minimal manipulations allowed a comparison of the degree to which parent status and gender affect warmth and competence ratings and whether the target was likely to be hired, promoted, and trained. As expected, the comparison of a working mother to a childless working woman in a professional setting was informative. In line with the stereotype content model, female professionals with children were viewed not only as warmer than competent but also as warmer and less competent than female professionals without children. Even more telling, this competence penalty in impression was associated with a reluctance to professionally reward the working mother. Specifically, a working mother was less likely to be hired, promoted, or trained than a female professional without children (see also Cuddy, Norton, & Fiske, 2005).

### An Experimental Investigation of the Relation Between the Dimensions

In light of the dearth of experimental work on these two dimensions, Judd et al. (2005) conducted several experiments to investigate how competence and warmth relate to each other and the factors that may influence this relationship. These authors selected individual behaviors rated as either high or low on one of the two dimensions but relatively uninformative on the other. Participants then received lists of behaviors allegedly describing two social targets. In a first experiment (Judd et al., 2005, Experiment 1), high-competence behaviors were attributed to the members of one group and low-competence behaviors to the members of the

other group. In a second experiment (Judd et al., 2005, Experiment 2), high-warmth behaviors were attributed to one group and low-warmth behaviors were attributed to the other. Each participant judged both groups on various scales that were related to warmth and competence.

Not surprisingly, when the behaviors attributed to the two targets differed on warmth, the high-competent group was judged to be more competent than the low-competent one. The same thing happened for warmth ratings in the second experiment, when warmth was manipulated in the behavior lists. Of more interest was the difference on the other, unmanipulated dimension. When the two target groups differed in competence (as defined by the behaviors attributed to them), the high-competence group was judged as less warm than the low-competence group. Likewise, when the targets differed in warmth, the high-warmth target was judged as less competent than the low-warmth target. Thus, when participants judged two groups who differed on one dimension, they were seen as differing on the second in the opposite direction. What makes this particularly compelling is that when the behaviors that were used were pretested to verify that, for instance, competence-relevant behaviors conveyed competence information but not warmth, there emerged a small positive correlation between the pretest ratings on competence and warmth. Thus, even though more competent behaviors were judged as slightly warmer than less competent ones in the pretest, when two groups were described with high- and low-competence behaviors, they were judged as also differing in warmth in the opposite direction.

Compensation was found by Judd et al. (2005) both for the manipulation of warmth (Experiment 1) and for the manipulation of competence (Experiment 2), but the effect was larger when competence was manipulated than when warmth was the manipulated dimension. In our view, this pattern of findings can be linked to research on impression formation by Wojciszke (2005), who claims that warmth is the primary dimension between the two. As we see it, the stronger compensation effect for the competence manipulation is due to the fact that participants are primarily oriented toward the warmth information. Knowing whether someone is a friend or a foe is crucial, and this information may possibly color evidence that concerns the competence of the target. Indeed, when warmth was manipulated, inferences about competence were less compelling, and the resulting compensation was less marked. On the other hand, when competence was manipulated, subsequent warmth inferences were stronger. Presumably, because competence information is less critical, it is also less likely to constrain the compensatory interpretation of warmth information. However, although there may be differences in the magnitude of the effect in the two

directions, it should be noted that compensation is found regardless of which dimension is manipulated.

Judd and colleagues (2005, Experiment 3) replicated this compensation effect with judgments about individuals. This time, the behaviors were attributed to one of two individuals, and it was these two individuals that participants were asked to judge. Again, a negative relationship between the two dimensions emerged such that the more competent individual was seen as less warm than the less competent individual. In a fourth experiment (Judd et al., 2005, Experiment 4), participants judged only one group, either the high group on the manipulated dimension or the low group. In this case, where a comparison between groups was not demanded, it was no longer the case that the high group on the manipulated dimension was judged lower on the other dimension. Thus there appears to be something in the comparison process between targets that induces the negative relationship between these two fundamental dimensions of social judgment. That is, given two individuals or two groups, if one of them is described more positively on one dimension than the other, then this evaluative difference seems reversed on the other dimension, perhaps in a compensatory manner. When, on the other hand, a single target or behavior is judged, then we feel free to say that if someone is positive in one way, that is, on one dimension, then he or she may be positive in other ways, namely, on the other dimension.

#### Justice, Justification, and Other Accounts of Compensation

Judd et al.'s (2005) results were obtained in an experimental context using unknown groups. They are entirely congruent with findings reported by Yzerbyt et al. (2005), who relied on real groups. It is therefore possible that the emergence of compensation in Judd et al.'s experiments results from the fact that perceivers typically engage in compensation in their social environment. Presumably, because such a compensatory mode of processing becomes habitual, perceivers express the same tendency even in a context that provides minimal information about the groups. Why would perceivers compensate when they are confronted with social targets, be they real or minimal groups? One possible account is motivational in tone. According to what may be seen as a concern for social justice, perceivers may be tempted to even things out so that both groups in the salient comparative context are seen as possessing positive as well as negative characteristics. Drawing on social identity theory (Tajfel & Turner, 1986), Mummendey and Schreiber (1983, 1984) found that social groups show creativity in selecting dimensions on which their group compares favorably to other

groups. A slightly different version of the same argument is at the heart of system justification theory (Jost & Banaji, 1994): People prefer a balanced view of social groups in order to justify the existing social structure (for a review, see Kay et al., 2007).

Appealing as these general explanations may be, an intriguing question is whether this compensatory tendency occurs when people are confronted with any set of dimensions or whether competence and warmth are somehow better "suited" to produce this pattern. If compensation emerges only or more easily when competence and warmth are involved, then one would question a strong version of the motivational interpretation that predicts compensation for any pair of dimensions. Instead, a more sophisticated version of the justice account would seem to be appropriate in which the specific structural and functional constraints that render these two dimensions fundamental are a key determinant of compensation.

#### Summary and Hypotheses

Judd et al. (2005) showed that a comparison context was necessary for the compensation effect to emerge. The aim of the present line of research is to examine another necessary condition of the compensation effect. Our previous studies examined exclusively the dimensions of competence and warmth (Judd et al., 2005), because these dimensions are considered fundamental and universal (Fiske et al., 2007). Accordingly, it remains impossible to know whether the compensation pattern obtained for competence and warmth is something that is a consequence of the special nature of these two dimensions or if it would emerge with any set of two dimensions that happen to be relevant in the judgment situation. The present studies were designed to test whether the negative relation between the two fundamental dimensions of competence and warmth is something unique to these two dimensions and thus attributable to their special status. If a compensatory pattern emerges regardless of the dimensions of judgment, then that would suggest that this pattern is a general evaluative process that tells us nothing specific about the underlying dimensions of social judgment. On the other hand, if the compensatory process is found only for these two dimensions, then that would further underscore the unique status of these two dimensions. And this would essentially change the nature of the theoretical explanation for the compensation effect in social judgment.

### EXPERIMENT 1

Because the present research was conducted in Europe rather than in the United States, it seemed important first to replicate the Judd et al. (2005) findings with

the new population before examining whether other dimensions of judgment would manifest compensation. Thus, our first study consisted of a replication of the Judd et al. procedure with stimulus materials developed in Europe. Additionally, in none of the studies conducted by Judd et al. did the manipulated dimension (whether competence or warmth was manipulated) randomly vary within the same study. That is, these authors found in one study a compensatory effect of a competence manipulation on warmth and in another study a compensatory effect of a warmth manipulation on competence. Experiment 1 corrected this potential shortcoming by randomly assigning participants to the content of the manipulated dimension.

## Method

### Pretest

For our manipulation, we needed behaviors that were perceived as valenced on one dimension and neutral on the other. We also needed behaviors that were perceived to be neutral on both dimensions.

*Valenced behaviors.* We translated to French the 79 behaviors pretested by Judd et al. (2005). We then presented this list to 22 students of the Université catholique de Louvain, who were approached in different libraries on campus. Two different orders of presentation were used. For each behavior, participants were asked two questions on a scale ranging from 1 (= *not at all*) to 9 (= *very much*). The questions were "How much would you say that a person displaying this behavior is competent, intelligent, dynamic, and organized?" and "How much would you say that a person displaying this behavior is sociable, warm, friendly, and caring?" The order of those two questions was counterbalanced across participants. We then compared each score against the scale's midpoint (= 5) using one-sample *t* tests. To be selected, behaviors needed to have one of the two scores significantly different from 5 but not the other. Using this criterion, we found 17 negative-competence, 15 positive-competence, 8 negative-warmth, and 12 positive-warmth behaviors. For each category, we selected the 8 behaviors with the largest differences from 5 on one dimension and the smallest differences on the other dimension. For example, "X spent hours with a friend after the friend's dog died," "X decided that everyone at the party was pretty shallow and left early," "X published a short story in a literary magazine while still in college," and "X did poorly on the exam because of mixing up the chapters that needed to be studied" were selected, respectively, as high-warmth, low-warmth, high-competence, and low-competence behaviors.

*Neutral behaviors.* We created an additional 16 behaviors in order to secure a sufficient number of neutral behaviors, that is, behaviors that are not valenced on either dimension. In this pretest, we also introduced 20 valenced behaviors in order to contrast with the neutral ones. The format of the pretest was identical to the pretest of the valenced behaviors. Twenty-five participants from the same population were approached in different libraries on campus. Only 5 of the 16 behaviors we had created were not different from the scale's midpoint on both competence and warmth.

To secure a total of eight neutral behaviors, we went back to the pretest of the valenced behaviors and found five that were not different from the scale's midpoint on competence or warmth. Of those, we selected the three that were most neutral.

*Correlations.* As was the case in Judd et al.'s (2005) pretests, the mean ratings of the behaviors on competence and warmth correlated positively. This was true for our first pretest ( $r = .23, p < .0001$ ) and even more so for the second one ( $r = .46, p < .0001$ ). As would be expected, considering our selection criteria, this correlation was markedly weaker for the 40 behaviors (8 behaviors  $\times$  5 categories) that composed our final set, although it remained positive and significant ( $r = .10, p < .005$ ).

### Participants and Design

Ninety-six psychology students at the Université catholique de Louvain took part in the experiment in exchange for partial course credit. The dimension of warmth was manipulated for half of the participants; competence was manipulated for the other half. The valence of the behaviors associated with each one of the two groups was manipulated within participants such that one group was high on the manipulated dimension whereas the other was low on this same dimension. Our dependent variables were the warmth and competence attributed to each of the two groups.

Although the manipulated dimension was our only between-subjects variable of interest, we also counterbalanced the materials in order to avoid effects due to specific behaviors and order. There were eight versions of the experiment for each one of the manipulated dimensions. The order in which the groups were measured on the dependent variable was counterbalanced, with half of participants rating the high group first and half of the participants rating the two groups in the reverse order. The specific names given to the two groups were also counterbalanced with the high group called the Green group and the low group called the Blue group, or the other way around. The behaviors used for the unmanipulated dimension and the neutral

behaviors were also counterbalanced. A first set was associated with the high group for half of the participants and with the low group for the other half, and the other way around for the second set. As a result, across participants, the behaviors associated with high and low groups on the unmanipulated dimension were identical.

Participants were randomly assigned to one of the 16 conditions that resulted from crossing these three counterbalancing factors with dimension, our critical between-participants factor.

### Procedure

Upon entering the lab, participants were greeted by the experimenter and informed that they were going to take part in an impression formation task. The experimenter explained that participants would have to form an opinion about two groups, one called the Green group and the other the Blue group, and to answer questions assessing their opinion.

The two groups were described with a series of behaviors. Each behavior was presented on a different card in a random order. Each card displayed the group name (Green or Blue) followed by the behavior that was attributed to a member of this group. There were 16 behaviors for each group. Of these, 8 were valenced on the manipulated dimension (8 positive for the high group and 8 negative for the low group), 4 were neutral, 2 were positive on the unmanipulated dimension, and 2 were negative on the unmanipulated dimension. The behaviors on the unmanipulated dimension and the neutral behaviors were counterbalanced across participants, so that any particular neutral behavior or behavior diagnostic of the unmanipulated dimension was seen equally often for both groups.

The experimenter instructed participants to read the cards one at a time and to separate them into two piles, one for the Green group the other for the Blue group. When participants had read all 32 behaviors, they were instructed to take the piles they had created one at a time and to read all the behaviors for each group a second time. The experimenter then took the cards away and gave participants an impression-writing task. For this task, participants were asked to write down their impression of each group in approximately 10 lines as if they were communicating it to another person who did not have the chance to read the cards. At the end of the writing task, participants were asked to read what they had written to make sure that it correctly conveyed their impression. This task was included simply to solidify the impressions formed from the behaviors.

After participants had completed the impression-writing task, they were given the trait-rating questionnaire. Participants rated each group on 20 traits (see

appendix), that is, 5 positive-competence, 5 negative-competence, 5 positive-warmth, and 5 negative-warmth traits. For each trait, the item read, "On average, how much would you say that the members of the Green/Blue group are . . . ?" Participants had to rate each trait on a 9-point scale ranging from 1 (= *not at all*) to 9 (= *totally*). The traits were presented in a random fixed order for the first group, then again for the second group.

After this, the experimenter thanked participants, answered their questions, and invited them to a debriefing session organized for all participants after the end of the data collection phase.

### Results

We computed separate scores of warmth and competence for the low and the high groups by combining the ratings on the five positive traits on each dimension with the ratings on the five negative traits (reversed) on the same dimension (Cronbach's alpha of the four scores > .91). These scores were analyzed separately, first for the manipulated and then for the unmanipulated dimension, by means of a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension) mixed-model ANOVA with the first factor varying between participants and the second within them (see Table 1).

The analysis of the ratings on the manipulated dimension revealed the presence of a highly significant effect of the group rated,  $F(1, 94) = 764.49, p < .0001$ , simply confirming the success of our manipulation. The group that was presented as higher on the manipulated dimensions was given much higher ratings ( $M = 7.94$ ) on that dimension than the group that was presented as lower ( $M = 3.34$ ). We also found a significant effect of the dimension manipulated,  $F(1, 94) = 18.17, p < .0001$ , indicating that the ratings were higher when competence ( $M = 5.87$ ) rather than warmth ( $M = 5.41$ ) was manipulated. Finally, the interaction between group rated and dimension manipulated was significant,  $F(1, 94) = 9.50, p < .003$ , revealing that the difference between the high and the low group was smaller when competence ( $M = 4.08$ ) rather than warmth ( $M = 5.11$ ) was manipulated (see Table 1).

Crucially, the ratings on the unmanipulated dimensions revealed that the predicted group effect was significant,  $F(1, 94) = 4.22, p < .05$ . In line with our compensation hypothesis, we found that the group that had been presented as higher on the manipulated dimension was rated as lower ( $M = 5.6$ ) on the unmanipulated dimension than the group that had been presented as lower on the manipulated dimension ( $M = 6.12$ ). There was also a significant effect of dimension manipulated,  $F(1, 94) = 66.27, p < .0001$ , indicating

**TABLE 1:** Ratings as a Function of Dimension Rated, Group Rated, and Dimension Manipulated (Experiment 1)

Dimension Manipulated	Dimension Rated			
	Manipulated		Unmanipulated	
	Low Group	High Group	Low Group	High Group
Competence	3.83	7.91	5.74	5.03
Warmth	2.85	7.96	6.49	6.18

that the ratings were lower when competence ( $M = 5.39$ ) rather than warmth ( $M = 6.34$ ) was manipulated. Although it appears as if the experimental effect is smaller when warmth rather than competence was manipulated, the interaction between group rated and dimension manipulated was not significant,  $F(1, 94) = 0.62, p < .43$ .

To further examine the pattern observed across the manipulated and unmanipulated dimensions, we submitted the scores on the manipulated and unmanipulated dimensions to a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension)  $\times$  2 (dimension rated: manipulated versus unmanipulated) mixed-model ANOVA with the first factor varying between participants and the second and third factors within them. Most important, the Group  $\times$  Dimension interaction was highly significant,  $F(1, 94) = 312.23, p < .0001$ , with the group difference being reversed on the unmanipulated dimension compared to the manipulated one.

## Discussion

Our data clearly support our hypotheses. First, we were able to replicate Judd et al.'s (2005) findings with a different population. Moreover, we did so in the context of a design where we manipulated both dimensions of competence and warmth. Compared to earlier work by Judd et al., who manipulated competence and warmth in separate studies, the present experiment also allows us to compare the magnitude of the compensation effect as a function of which dimension is manipulated. The absence of a significant interaction on the unmanipulated dimension ratings suggests that a comparable level of compensation emerges regardless of whether competence or warmth is manipulated, even though the means suggest that the compensation effect might be larger when competence rather than warmth is manipulated.

On the basis of our data, we are confident in saying that compensation is an important factor in impression formation. Although our participants were very aware of the differential position of the two groups on the manipulated dimension, their judgments on the other

dimension showed a radically different pattern. They judged the group that was higher on the manipulated dimension to be lower on the unmanipulated dimension. This compensation pattern emerged in spite of the fact that the information provided on the unmanipulated dimension was not only minimal but also totally counter-balanced. Also, compensation emerged even though the two dimensions were positively correlated in our pretest judgments of the behaviors themselves and, in spite of our best efforts, in our experimental materials. In this context, the reversal in valence observed on the unmanipulated dimension lends even more credit to the robustness of the compensation effect in group perception.

## EXPERIMENT 2

The pattern reported by Judd et al. (2005) that we replicated in Experiment 1 strongly suggests that competence and warmth are related in a compensatory way. One important question, however, is whether the observed compensatory judgments are the consequence of the specific comparative context used in this paradigm or whether the nature of the dimensions also plays a role in the emergence of compensation. Judd et al. showed that when competence and warmth were manipulated in a context where participants judged only one group, no compensatory pattern emerged. Does this mean that a comparative context involving two groups (or two individuals) is a sufficient factor and that any two dimensions used in such a context would lead to compensation in observers' judgments? We believe not. Our view is that competence and warmth are fundamental dimensions of social judgment and that they are uniquely related to each other, that is, in a compensatory way, whenever two social targets are compared. One obvious way to test this conjecture is to use the same comparative context as in Experiment 1, manipulating competence or warmth, and to check whether judgments on some other, unrelated dimension show compensation. Our prediction is that no compensation should be observed and that a halo pattern will emerge instead (i.e., the group that is high on the

manipulated dimension will be judged higher on the unmanipulated one). Experiment 2 was conducted to examine this issue.

The specific third dimension we decided to use in Experiment 2 was healthiness. We chose this dimension because we needed a dimension that would be seen as relatively unrelated to either competence or warmth. Discussions with participants in Study 1 and among the experimenters led us to believe that this would be the case with healthiness.

## Method

### *Pretest*

For this experiment, we needed valenced behaviors on the third dimension of healthiness in addition to our valenced behaviors on the warmth and competence dimensions. Thirteen subjects were asked to rate a total of 66 behaviors. Specifically, we created 34 behaviors (16 positive and 18 negative ones) that we hoped would be related to healthiness. We also included the 32 behaviors used in Experiment 1. This allowed us to check whether our third dimension was linked to either warmth or competence in our final set of behaviors.

Subjects were asked to rate each behavior on each of the three dimensions, that is, warmth, competence, and healthiness, using a 9-point scale ranging from 1 (= *not at all*) to 9 (= *very much*). To select behaviors for the healthiness dimension, we chose those behaviors that were significantly different from the midpoint of the scale (= 5) on the healthiness dimension but not on warmth or on competence. Five positive and four negative behaviors met our criterion. Because we needed only four positive and four negative behaviors, one positive was discarded. For example, "X is almost never sick" and "X hates vegetables and avoids them as much as possible" were selected, respectively, as high- and low-healthiness behaviors.

*Correlations.* We measured the correlation between the mean scores of competence, warmth, and healthiness for the 40 behaviors that were selected to be in the experiment. All correlations were significantly positive and of similar magnitude ( $r_s > .33$ ,  $p_s < .04$ ).

### *Participants and Design*

Sixty-nine undergraduate students took part in exchange for partial course credit. The design was a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension) mixed-model ANOVA with the first factor varying between participants and the second within them. In every case, participants received behaviors

relevant to the manipulated dimension (eight for the high group and eight for the low group) and for the unmanipulated healthiness dimension (two high and two low for each group). Judgments were made for both groups on both the manipulated and the healthiness dimension.

Three control variables were added to the design. The first was which group (the high or the low group) was called the Blue group and which was called the Green group. The second control was which was presented and measured first (in the impression-writing and in the traits-rating task). And the third control was which set of behaviors on the healthiness dimension was used with the high group and which one was used with the low group. Crossing these three control variables with the between-subjects factor resulted in 16 different conditions. Participants were randomly assigned to one of those conditions.

### *Procedure*

The procedure was similar to the procedure of Experiment 1 with the exception of the behaviors used to describe the groups and the traits used to measure the impression. A total of 12 behaviors were attributed to each group. Of these, 8 were valenced behaviors (positive for the high group, negative for the low group) on the manipulated dimension (either competence or warmth), and the remaining 4 were 2 positive behaviors on the healthiness dimension and 2 negative ones on this same dimension. The trait-rating questionnaire was the same as in Experiment 1 with the exception that there were three instead of five traits of each sort and that they were traits on the manipulated and on the healthiness dimension (see appendix). These traits were rated in a random fixed order.

## Results

We computed separate scores on each dimension, manipulated and healthiness, for the low and the high group by combining the ratings on the three positive traits on each dimension with those on the three negative traits (reversed) on the same dimension. The reliability for the low group was high for competence and warmth (and somewhat lower for healthiness; Cronbach's alpha = .82, .96, and .64, respectively). Similarly, the reliability for the high group was high for competence and warmth and somewhat lower for healthiness (Cronbach's alpha = .83, .96, and .68). These scores were then analyzed separately by means of a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension) mixed-model ANOVA with the first factor varying between participants and the second within them (see Table 2).

**TABLE 2:** Ratings as a Function of Dimension Rated, Group Rated, and Dimension Manipulated (Experiment 2)

Dimension Manipulated	Dimension Rated			
	Manipulated		Unmanipulated	
	Low Group	High Group	Low Group	High Group
Competence	3.21	7.77	4.73	6.20
Warmth	2.26	8.29	5.09	6.29

The analysis of the ratings on the manipulated dimension revealed a significant group effect,  $F(1, 67) = 384.43$ ,  $p < .0001$ , confirming the success of our manipulation. The group that was higher on the manipulated dimension was given much higher ratings ( $M = 8.03$ ) than the group that was lower ( $M = 2.74$ ). We also found a significant effect of dimension manipulated,  $F(1, 67) = 4.16$ ,  $p < .05$ , indicating that the ratings were higher when competence ( $M = 5.49$ ) rather than warmth ( $M = 5.28$ ) was manipulated. Finally, the Group Rated  $\times$  Dimension manipulated interaction was also significant,  $F(1, 67) = 7.49$ ,  $p < .008$ , revealing that the difference between the high and the low group was smaller when competence ( $M = 4.56$ ) rather than warmth ( $M = 6.03$ ) was manipulated (see Table 2).

Turning to the ratings on the healthiness dimension, the predicted group main effect was significant,  $F(1, 67) = 23.77$ ,  $p < .0001$ . Contrary to a compensation effect but in line with the idea of a halo effect, the group that had been presented as higher on the manipulated dimension was rated higher ( $M = 6.25$ ) on the healthiness dimension than the group that had been presented as lower on the manipulated dimension ( $M = 4.91$ ). The effect of dimension manipulated was not significant. Interestingly, there was no interaction between group rated and dimension manipulated ( $p > .10$ ), suggesting that the experimental effect was of similar magnitude regardless of whether competence or warmth was manipulated.

To examine the pattern observed across the manipulated and healthiness dimensions, we submitted the difference scores to a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension)  $\times$  2 (dimension rated: manipulated versus healthiness) mixed-model ANOVA with the first factor varying between participants and the other factors within them. The Group Rated  $\times$  Dimension interaction was significant,  $F(1, 67) = 155.31$ ,  $p < .0001$ , and resulted from the fact that the difference between the high and the low group was smaller for healthiness ( $M = 1.34$ ) than for the manipulated dimension ( $M = 5.29$ ). Nevertheless and importantly, the group differences were in the same direction for the manipulated and healthiness dimensions.

## Discussion

In this experiment, we reasoned that the special status of competence and warmth would imply that no other dimension would behave like these two do even in the comparative context used in our earlier experiments. In our pretest, we sought to isolate a third dimension that was sufficiently distinct from competence and warmth. Our goal was then to manipulate the level of competence or warmth of the behaviors associated with two groups, provide ambiguous information on the third dimension, and see how observers would rate the high and the low group on both the manipulated and this third dimension.

The results tell a clear story. Contrary to the pattern reported by Judd et al. (2005) and found in Experiment 1, when competence and warmth are involved, the ratings on our third dimension failed to show compensation. Even though participants clearly differentiated the high and the low groups on the manipulated dimension, whether competence or warmth, they inferred a similar pattern on healthiness, our third dimension, such that the high group on the manipulated dimension was rated higher on the healthiness dimension than the low group. The ratings thus reflected a halo effect instead of a compensation pattern. Moreover, this halo effect was found whether competence or warmth was manipulated. It is noteworthy that this halo emerged even in a comparative context that has been found to play a major role for the emergence of compensation on competence and warmth. Having used the same procedure and population as in Experiment 1, the emergence of a halo effect contrasting with a compensation effect nicely supports our intuition that the two dimensions of competence and warmth are related in a rather unique way when it comes to forming impressions about social targets.

## EXPERIMENT 3

Supportive as the results of Experiment 2 may be, we wanted to garner additional evidence in a follow-up experiment. This time, in addition to providing participants with behaviors on the manipulated dimension, we

gave participants ambiguous information on healthiness and whatever other dimension, warmth or competence, had not been manipulated. For the sake of clarity, we will continue to call the healthiness dimension the “third dimension” and whichever fundamental dimension was not manipulated the “unmanipulated dimension.” Our aim here is to show that a halo and a compensation effect can co-occur in judging the same target groups. Specifically, our prediction is that participants’ impressions will reveal a halo effect on the third dimension but a compensation effect on the unmanipulated dimension.

## Method

### *Participants and Design*

Seventy 1st-year students took part in the study for partial course credit. The design was a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension) mixed-model ANOVA with the first factor varying between participants and the second within them.

### *Procedure*

The general procedure was the same as for Experiment 2 except that we presented 16 behaviors for each group. Of these, 8 were valenced (positive for the high group, negative for the low group) on the manipulated dimension, 4 were on the unmanipulated dimension (2 positive and 2 negative), and the remaining 4 were on the third dimension (2 positive and 2 negative). The set of behaviors used on the unmanipulated and the third dimension was counterbalanced across participants, so that any particular behavior of the unmanipulated or of the third dimension was seen equally often for the high group and for the low group. As before, two additional control variables were presentation order and association with the specific colors. This results in a total of 16 conditions.

The impression-writing and trait-rating tasks were the same as in Experiment 2 except that the latter included three dimensions. In other words, there were three positive and three negative traits on which each group was rated, assessing perceived warmth, competence, and healthiness.

## Results

One participant was discarded from the analyses because of a failure to complete the trait-rating task. We computed separate scores on each dimension, that is, manipulated, third, and unmanipulated, for the low and the high groups by combining the ratings on the three positive traits on each dimension with those on the three negative traits (reversed) on the same dimension.

The reliability for the low group was high for competence and warmth and somewhat lower for healthiness (Cronbach’s alpha = .87, .97, and .65, respectively). Similarly, the reliability for the high group was high for competence and warmth and somewhat lower for healthiness (Cronbach’s alpha = .89, .96, and .66). These scores were then analyzed separately by means of a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension) mixed-model ANOVA with the first factor varying between participants and the second within them.

There was a significant group main effect on the scores on the manipulated dimension,  $F(1, 67) = 167.83, p < .0001$  (see Table 3). The group that was higher on the manipulated dimension was given much higher ratings on that dimension ( $M = 7.92$ ) than the group that was lower ( $M = 3.2$ ). We also found a significant effect of dimension manipulated,  $F(1, 67) = 28.03, p < .0001$ , indicating that the ratings were higher when competence ( $M = 5.83$ ) rather than warmth ( $M = 5.22$ ) was manipulated. The interaction between group rated and dimension manipulated was significant,  $F(1, 67) = 4.70, p < .04$ , revealing that the difference between the high and the low group was smaller when competence ( $M = 4.00$ ) rather than warmth ( $M = 5.61$ ) was manipulated.

Turning to the third dimension (healthiness), there was only a group main effect,  $F(1, 67) = 35.79, p < .0001$ , such that the group that was higher on the manipulated dimension was given higher ratings ( $M = 6.38$ ) on the third dimension than the group that was lower ( $M = 4.75$ ). In addition, there was no interaction ( $p > .9$ ). As such, this pattern replicates the results from the second study, strongly supporting the halo rather than the compensatory effect on this third dimension.

For the unmanipulated dimension, the group main effect was not significant,  $F(1, 67) = 1.22, p < .28$ . The effect of dimension manipulated was significant,  $F(1, 67) = 8.56, p < .005$ . Interestingly, there was a significant Group Rated  $\times$  Dimension Manipulated interaction,  $F(1, 67) = 6.17, p < .02$ . To get a clearer picture of this interaction, we analyzed the scores separately for each manipulated dimension. When warmth was manipulated, the group main effect was not significant,  $F(1, 30) = 1.29, p < .26$ . When competence was manipulated, we observed the expected compensation effect,  $F(1, 37) = 5.66, p < .03$ .

To appraise the dissimilarity in patterns observed across the third and unmanipulated dimensions, we submitted the scores on the third and unmanipulated dimensions to a 2 (dimension manipulated: warmth versus competence)  $\times$  2 (group rated: high versus low on the manipulated dimension)  $\times$  2 (dimension rated: third

**TABLE 3:** Ratings as a Function of Dimension Rated, Group Rated, and Dimension Manipulated (Experiment 3)

Dimension Manipulated	Dimension Rated					
	Manipulated		Healthiness		Unmanipulated	
	Low Group	High Group	Low Group	High Group	Low Group	High Group
Competence	3.83	7.83	4.75	6.30	6.32	5.08
Warmth	2.42	8.03	4.94	6.48	5.97	6.45

versus unmanipulated) mixed-model ANOVA with the first factor varying between participants and the second and third factors within them.

There was a main effect of dimension manipulated,  $F(1, 67) = 5.63, p < .03$ , such that the scores given to the groups on the third and unmanipulated dimensions were slightly higher when warmth was manipulated ( $M = 5.96$ ) than when competence was manipulated ( $M = 5.62$ ). There was also a significant group effect,  $F(1, 67) = 5.93, p < .02$ . The group that was higher on the manipulated dimension was given higher ratings on the two other dimensions on average ( $M = 6.04$ ) than the group that was lower on the manipulated dimension ( $M = 5.46$ ). The dimension effect was also significant,  $F(1, 67) = 16.58, p < .0001$ , with higher ratings for the unmanipulated ( $M = 5.93$ ) than for the third dimension ( $M = 5.57$ ).

In line with our hypothesis, the key Group Rated  $\times$  Dimension Rated interaction was significant,  $F(1, 67) = 25.38, p < .0001$ , revealing that the difference between the high and the low group was in the opposite direction on the third dimension ( $M = 1.63$ ) than on the unmanipulated dimension ( $M = -0.47$ ). It should be noted also that a significant three-way interaction,  $F(1, 67) = 5.07, p < .03$ , signaled, as shown above, that this reversal was found only when competence but not warmth was manipulated.

## Discussion

The results of Experiment 3 further support our hypothesis that the compensation pattern linking competence and warmth is likely to be special. When either competence or warmth was manipulated, we observed halo on the third dimension, replicating the findings of Experiment 2. In sharp contrast, we found no halo on the unmanipulated dimension. When we manipulated competence, we obtained compensation. This reversal of the impression formed on the third and the unmanipulated dimensions was confirmed despite the fact that participants were given similarly neutral information on both of these dimensions. When we manipulated warmth, the pattern failed to reverse. In other words, we found neither compensation nor halo on the

unmanipulated dimension. This finding is reminiscent of the fact that the compensation observed in Experiment 1 was also more modest, albeit not significantly so, when warmth was manipulated compared to when competence was manipulated. In our opinion, this may signal the fact that the warmth dimension is more constraining than its competence counterpart in the information it conveys about the groups. Note that in Experiment 3, participants received information about both fundamental dimensions (one manipulated, the other one unmanipulated) and the third dimension, whereas they received information about only two dimensions in Experiment 1 and in Experiment 2. The presence of information on the two unmanipulated dimensions probably added noise in the manipulation, making it more difficult to observe compensation on competence. Of course, the observed pattern may also be partially the result of the differential strength of the manipulations. Consistent with this, the negativity of the low group was much more pronounced in the case of the warmth manipulation than when competence was manipulated.

In sum, the clear message emerging from Experiment 3 is consistent with our predictions that competence and warmth are related in a way that is the consequence of the unique nature of the relation between these two dimensions. Whereas both the third and the unmanipulated dimensions were presented with balanced information, the two-way interaction between groups and these two dimensions show that they react very differently to the manipulation.

## GENERAL DISCUSSION

Competence and warmth have long been identified as critical dimensions in personality and social psychology (Fiske et al., 2007; Judd et al., 2005; Wojciszke, 2005). Still, hardly any experimental work has been conducted to examine their dynamic relations. Recent work by Judd and colleagues (2005) provided causal evidence that competence and warmth relate to each other in a compensatory way in contexts where two groups or two individuals are being evaluated. One

unaddressed question was whether the compensatory relation observed between competence and warmth is due to the particular relations between these dimensions or to the fact that observers were simply confronted with two dimensions in a comparative context. We designed three experiments to address this important issue by examining participants' reactions to a third dimension. The message emerging from our data is that competence and warmth are indeed related in a special way.

In Experiment 1, we replicated the pattern observed by Judd et al. (2005) using participants from a different continent, that is, Europe, and speaking a different language, that is, French. Moreover, whereas earlier work always manipulated either competence or warmth, the present study revealed the presence of compensation whether competence or warmth was manipulated. Using the same procedure and population as Experiment 1, Experiment 2 showed that the use of a different dimension as our unmanipulated dimension did not lead to compensation but to halo. Whether competence or warmth was manipulated, participants manifested a significant halo effect in their judgments on this third dimension.

In Experiment 3, we wanted to examine the behavior of both the third and the unmanipulated dimension at the same time. Two messages emerged from the data. First, we replicated the pattern observed in Experiment 2 on the third dimension. Again, regardless of whether competence or warmth was manipulated, we observed halo on the third dimension. Second, and importantly, no halo materialized on the unmanipulated dimension. More fine-grained analyses revealed that compensation emerged on warmth when competence was manipulated, whereas no significant difference was observed when warmth was manipulated. This slight discrepancy between the manipulation of competence and warmth is evocative of the pattern observed in Experiment 1. We return to this issue shortly.

Putting together our findings, it is clear that competence and warmth are related to each other in a way that is not similar to what can be observed for other dimensions. Whenever we manipulated competence and warmth and observed the resulting judgments associated with the third dimension, we observed a halo effect. This was not the case when the unmanipulated dimension concerned competence or warmth.

These findings, particularly those obtained in Experiments 2 and 3, question the viability of an interpretation of our results in terms of an undifferentiated justice concern on the part of the participants (Kay et al., 2007). This interpretation holds that participants are expressing compensatory judgments on the unmanipulated dimension because they would like each of the groups involved in the comparative context to be associated with some positive feature. To the extent that one group is clearly associated

with the positive end of the manipulated dimension, participants should interpret the ambiguous evidence on the unmanipulated dimension in a way that would allow them to associate the other group with the positive end of that dimension. That is, one should expect compensation regardless of what the unmanipulated dimension is, as long as this dimension is not strongly correlated with the manipulated dimension.

The present data contradict such a view. Participants did not at all feel compelled to balance their judgments of the two groups when a dimension other than competence or warmth was used as the unmanipulated dimension. In these situations, a halo was observed, meaning that participants ended up with judgments that favored one group over the other on both dimensions. In light of the present research, a refined, and more focused, version of the justice argument would provide a better explanation of the data. In our view, participants balance out their judgments only when competence and warmth are at stake, precisely because these two dimensions refer to fundamental aspects, both structurally and functionally, of social interaction (Fiske et al., 2002; Judd et al., 2005; Peeters, 2002). Competence and warmth are both central and autonomous with respect to each other in such a way that they can be used to serve a compensatory motive. In other words, because competence and warmth constitute the two fundamental dimensions that come into play in evaluating social targets, one's judgments tend to be balanced on these specific dimensions only.

In sharp contrast, when a dimension other than warmth or competence is brought in, we see two possibilities. A first option is that the specific dimension can in fact be construed as strongly related to either warmth or competence. Such an outcome would be conducive to either halo or compensation, depending on whether the dimension is seen as correlated with one or the other of the two basic dimensions. A second option is that the specific dimension is sufficiently uncorrelated (or equally correlated) to either one of these two dimensions, as was the case in the materials we used in the present series of studies. In such a situation, we would expect some sort of assimilation effect to operate, resulting in a halo pattern with whichever of the two fundamental dimensions was manipulated. This is exactly what happened in Experiments 2 and 3.

Our focused explanation of compensation acknowledges the fundamental nature of competence and warmth. It dovetails nicely with a number of other recent findings reported in the literature. For instance, the work by Jost, Kay, and colleagues (for a review, see Kay et al., 2007) on system justification also refers to complementary stereotypes. According to these authors (Jost & Banaji, 1994), stereotypes are most efficient tools, allowing people, and

especially members of low-status and underprivileged groups, to rationalize and justify an unfavorable social system they live in and thereby maintain the societal status quo (Eagly & Steffen, 1984; Hoffman & Hurst, 1990; Yzerbyt, Rocher, & Schadron, 1997). Although these authors' view could certainly be understood as promoting an undifferentiating justice concern, our focused account provides useful insight to a number of their findings. For instance, Jost and Kay (2005) found that their female participants were more supportive of the social system after they had been confronted with statements expressing benevolent sexism or to complementary stereotypes than when they had been reading nonstereotypical favorable stereotypes about women. These authors interpret these findings to say that cultural stereotypes play a key role in the emergence of justification. In our view, these data equally suggest that not any dimension does the job in terms of compensation. A similar argument can be made regarding other work (Kay, Jost, & Young, 2005). We hasten to say that these two interpretations are not exclusive. Simply, we suggest that the recognition of the special status of our two dimensions has a distinct advantage in terms of predictive power.

One additional remark concerns the fact that the manipulation of competence seemed more likely to produce compensation than the manipulation of warmth in Experiment 1, even though the compensation pattern was not significantly different as a function of which dimension had been manipulated. Moreover, in Experiment 3, the manipulation of competence was in fact the only one to produce compensation. Although features of the specific materials we used may, at least partially, account for this differential impact, it could very well be that

something more systematic is at work. Indeed, we see this disparity in the emergence of compensation as resulting from what we think is the primacy of warmth over competence. That warmth may be a more critical dimension than competence, at least when judgments of other people or groups are concerned, has already been suggested in the now-massive literature on social judgment (Fiske et al., 2002; Judd et al., 2005). Given its importance, information about warmth colors (or constrains) subsequent inferences more than information about competence. It would be most instructive to examine in more detail the reasons for this primacy of warmth and document it in a variety of empirical ways, as Wojciszke (2005) has done for person perception.

To sum up, the present findings go a long way to underscore the unique relation between warmth and competence. By showing that something is going on between these two dimensions that cannot be found for other dimensions, we hope to have stressed their central status in the way people appraise their social environment. In our opinion, the implications of the present work contribute to a better understanding of a number of striking phenomena in the realm of impression formation (Rosenberg et al., 1968; Wojciszke, 2005), interpersonal relations (Smeesters, Warlop, Van Avermaet, Corneille, & Yzerbyt, 2003), and intergroup processes and stereotyping (Fiske et al., 2007; Judd et al., 2005; Kay et al., 2007; Yzerbyt et al., 2005), because our findings show that social perceivers may be expected to react in predictable ways by relying on this compensatory pattern. Additionally, this work underscores the fundamental nature of these two dimensions in social judgment.

## APPENDIX PERSONALITY TRAITS

<i>Dimension</i>					
<i>Warmth</i>		<i>Competence</i>		<i>Healthiness</i>	
<i>Negative</i>	<i>Positive</i>	<i>Negative</i>	<i>Positive</i>	<i>Negative</i>	<i>Positive</i>
<i>Traits Used in Experiment 1</i>					
Cold	Caring	Disorganized	Capable		
Derogating	Nice	Lazy	Competent		
Irritable	Sociable	Messy	Conscientious		
Selfish	Tolerant	Negligent	Motivated		
Unpleasant	Warm	Unintelligent	Skilled		
<i>Traits Used in Experiments 2 and 3</i>					
Cold	Warm	Disorganized	Capable	Unhygienic	Balanced
Derogating	Nice	Negligent	Competent	Scruffy	Active life
Selfish	Sociable	Messy	Skilled	Unkempt	Healthy

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