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Motivation to support a desired conclusion versus motivation to avoid an undesirable conclusion: The case of infra-humanization

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Social motivation has been shown to influence various cognitive processes. In the present paper, it is verified that people are motivated to view out-groups as possessing a lesser degree of humanity than the in-group (Leyens et al., 2000) and that this motivation influences logical processing in the Wason selection task. So far, studies on infra-humanization have been shown to influence attribution of uniquely human characteristics to groups. Most of these studies focused on the attribution of secondary emotions. Results have shown that secondary emotions are preferentially attributed to in-group members (Leyens et al., 2001). Also, people tend to react differently to in-group and out-group members displaying secondary emotions (Gaunt, Leyens, & Sindic, 2004; Vaes, Paladino, Castelli, Leyens, & Giovanazzi, 2003). In the present paper, it is argued that infra-humanization is a two-direction bias and that it does influence logical processing among perceivers. Specifically, infra-humanization motivation impacts logical processing in two different directions. First, most motivation is spent to reach the desirable conclusion that the in-group is uniquely human. Second, least motivation occurs to support the undesirable conclusion that the out-group is uniquely human. These hypotheses are tested in four cross-cultural studies that varied the status and the conflicting relations between groups. Results were in line with the predictions and further confirmed that infra-humanization biases can be obtained independently of status and conflict (but see Cortes, Demoulin, Leyens, & de Renesse, 2005). The discussion relates these findings with in-group favouritism and out-group derogation (Brewer, 1999) and underlines the importance of infra-humanization in counteracting system justification biases (Jost & Banaji, 1994).

Il a été démontré que la motivation sociale influence de nombreux processus cognitifs. Dans cet article, nous verifions que les gens sont motivés à voir les exogroupes comme possédant un degré d'humanité moindre que l'endogroupe (Leyens et al., 2000) et que cette motivation influence le traitement logique dans la tâche de sélection de Wason. A ce jour, les études sur l'infra-humanisation ont montré une influence dans l'attribution de caractéristiques typiquement humaines aux groupes. La plupart de ces études étaient centrées sur l'attribution d'émotions secondaires. Les résultats ont montré que les émotions secondaires sont attribuées préférentiellement aux membres de l'endogroupe (Leyens et al., 2001). De plus, les gens tendent à réagir différement face à des membres de l'endogroupe ou de l'exogroupe qui s'expriment à l'aide d'émotions secondaires (Gaunt, Leyens, & Sindic, 2004; Vaes, Paladino, Castelli, Leyens, & Giovanazzi, 2003). Dans cet article, nous postulons que l'infra-humanisation est un biais bi-directionnel et que ce biais influence le traitement logique des gens. Spécifiquement, l'infra-humanisation influence le traitement logique dans deux directions. Premièrement, les gens sont fortement motivés à atteindre la conclusion désirable que l'endogroupe est typiquement humain. Deuxièment, les gens sont les moins motivés à atteindre la conclusion indésirable que l'exogroupe est typiquement humain. Ces hypothèses sont testées dans quatre études cross-culturelles qui varient tant les relations de statut que les relations de conflit entre les groupes. Les résultats obtenus sont en accord avec les prédictions et confirment le fait que le biais d'infra-humanisation peut être obtenu indépendamment du statut ou des relations de conflit entre les groupes

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(mais voir Cortes, Demoulin, Leyens, & de Renesse, 2005). La discussion articule les résultats avec le favoritisme endogroupal et la dérogation exogroupale (Brewer, 1999) et souligne l'importance de l'infra-humanisation pour contre-carrer les biais liés à la théorie de justification du système (Jost & Banaji, 1994).

Se ha mostrado que la motivación social influye sobre varios procesos cognitivos. En el presente trabajo, se verifica que la gente se encuentra más motivada para ver un grado menor de humanidad en personas fuera de su grupo que en aquéllas pertenecientes al grupo propio (Leyens et al., 2000) y que esta motivación influye sobre el procesamiento lógico en la tarea de selección de Watson. Hasta el momento, los estudios sobre infrahumanización han mostrado que influye en la atribución de características puramente humanas a los grupos. La mayoría de estos estudios se han centrado en la atribución de emociones secundarias. Los resultados han mostrado que las emociones secundarias se atribuyen preferentemente a miembros del propio grupo (Leyens et al., 2001). También, la gente tiende a reaccionar de manera diferente ante miembros del propio grupo y de externos a éste y muestra emociones secundarias (Gaunt, Leyens, & Sindic, 2004; Vaes, Paladino, Castelli, Leyens, & Giovanazzi, 2003). En el presente trabajo, se alega que la infrahumanización es un sesgo bi-direccional y que influye sobre el procesamiento lógico entre quienes perciben. Específicamente, la motivación para la infrahumanización impacta el procesamiento lógico en dos direcciones diferentes. Primero, la mayor parte de la motivación se emplea para alcanzar la conclusión deseada de que el grupo propio es singularmente humano. Segundo, ocurre menos motivación para apoyar la conclusión indeseable de que aquéllos fuera del grupo propio son singularmente humanos. Se someten a prueba estas hipótesis en cuatro estudios transculturales en los que variaban el estatus y las relaciones en conflicto entre los grupos. Los resultados coinciden con las predicciones y confirman además que es posible obtener sesgos de infrahumanización independientemente del estatus y el conflicto (pero véase, Cortes, Demoulin, Leyens, & de Renesse, 2005). La discusión relaciona estos hallazgos con el favoritismo hacia el grupo propio y el desprecio hacia aquéllos externos a éste (Brewer, 1999) y subraya la importancia de la infrahumanización y cómo ésta contrarresta los sesgos del sistema de justificación (Jost & Banaji, 1994).

In the social domain, the motivation to view the in-group in a more favourable light than the out-group was found to influence various cognitive processes such as memory (Howard & Rothbart, 1980), statistical inferences (Schaller, 1992), causal attribution (Hewstone, 1990; Pettigrew, 1979), and language use (Maass, Salvi, Arcuri, & Semin, 1989). Recently, Gaunt and colleagues (Gaunt, Leyens, & Sindic, 2004) have shown that the specific motivation to perceive the out-group as less human than the in-group influences the use of situational information in behavioural attributions. Specifically, these authors have consistently demonstrated that the motivation to infra-humanize out-group members (Leyens et al., 2000) counteracts effectively classical dispositional attribution biases (for review see Gilbert & Malone, 1995). In other words, when confronted with information supporting the undesirable conclusion that out-group members share the same humanity as in-group members, participants utilize situational information to impeach dispositional attributions.

The present paper looks at the impact of infra-humanization motivation upon responses to conditional statements. First, the infra-humanization hypothesis is summarized, as well as current empirical evidence supporting its conclusion. Second, evidence for the influence of social motivated reasoning in the Wason Selection Task (WST; Wason, 1968) problem-solving situation is presented. Finally, specific hypotheses concerning the role of infra-humanization motivation upon logical processing will be delineated and tested in a cross-culturally replicated study.

INFRA-HUMANIZATION

Among the features usually reserved for the human community, those most commonly cited by both scientists and lay people (Demoulin et al., 2004; Leyens et al., 2000; Leyens et al., 2003) are intelligence (reasoning, memory), language (ability to speak), and the capacity to experience certain types of emotions (secondary, complex emotions such as love or remorse, as opposed to basic, primary emotions such as surprise or fear). Prejudice has long been illustrated and publicized in the domains of intelligence and language (Herrnstein & Murray, 1994). In contrast, the interest in emotions in general (Mackie & Smith, 2002), and in secondary emotions in particular, is new. Studies showing the differential attribution of secondary emotions to in-groups and out-groups are quite numerous and display a steady pattern (Gaunt, Leyens, & Demoulin, 2002; Leyens et al., 2001; Paladino et al., 2002). In a consistent manner, people attribute significantly more secondary

emotions to the in-group than to out-groups. No such result is obtained for primary emotions, which are common to all, even animals. Leyens and colleagues (2000) interpret this result as relying on both social identity theory (Tajfel & Turner, 1986) and subjective essentialism (Rothbart & Taylor, 1992), and they call it infra-humanization. Specifically, infra-humanization refers to the tendency to reserve the human essence for one's in-group. That is, all uniquely human characteristics should primarily be associated with or attributed to the in-group, whereas some or all of them will be lacking in the out-group's description. Because secondary emotions, in contrast to primary ones, are uniquely human characteristics, their differential attribution to groups reflects such infra-humanization tendency.

Current studies on infra-humanization have shown that people attribute more secondary emotions to the in-group than to the out-group (Leyens et al., 2001). Secondary emotions are also more implicitly associated with the in-group and primary emotions with the out-group than the reverse (Paladino et al., 2002). Association of secondary emotions with groups impacts memory (Gaunt et al., 2002), dispositional attributions (Gaunt et al., 2004), and behaviours (Vaes, Paladino, Castelli, Leyens, & Giovanazzi, 2003). While identification with the in-group appears to be a powerful moderator of infra-humanization (Demoulin et al., 2003), this is not always the case (Cortes, Rodriguez, Rodriguez, Demoulin, & Leyens, 2003).

All the infra-humanization studies conducted so far have involved groups that were characterized by slightly conflicting relations. It has been repeatedly shown that the presence of conflict is not necessary for the induction of an in-group-favouritism bias (e.g., Tajfel, Bundy, Billig, & Flament, 1971), but this presence is said to be necessary for the appearance of out-group derogation (Brewer, 1999; Mummendey & Otten, 1998). Infra-humanization supposes by definition the combination of in-group favouritism and out-group derogation. Indeed, in contrast to measures used to show in-group favouritism in the minimal group situations (Tajfel, 1978), humanity represents a zero-sum game (Leyens et al., 2003). If a group claims more humanity than another, it supra-humanizes itself at the same time as it infra-humanizes the other. Because infra-humanization comprises out-group derogation, and because out-group derogation is thought to necessitate conflict, it would be theoretically interesting to verify whether infra-humanization would show up in the absence of conflict as well as in its presence. In the study presented below, this hypothesis is tested using intergroup relations with various degrees of conflict.

Also, in most of the infra-humanization studies, the in-group had a higher status than the out-group (but see Cortes et al., 2005; Leyens et al., 2001; Paladino et al., 2002, Expt. 4). For instance, the in-group was Belgians and the out-groups were Arabs (Boccato, Cortes, Demoulin, & Leyens, 2005; Gaunt et al., 2002; Paladino et al., 2002), Turks (Gaunt, Sindic, & Leyens, in press), or Africans (Boccato et al., 2005). According to system justification theory (Jost & Banaji, 1994; Jost & Hunyady, 2002), groups behave in specific ways to maintain the status quo of the society. It is therefore normal that higher-status groups infra-humanize lower-status ones. Moreover, system justification also predicts that lower-status groups derogate themselves because they have accepted and internalized the existing hierarchy. This latter prediction has not been verified in the case of infra-humanization. In the rare conditions in which a lower-status group was tested, it used secondary emotions to infra-humanize a higher-status out-group to the same degree that it was infra-humanized by this higher-status group (Leyens et al., 2001, Expt. 2). This divergence from the societal status quo could be due to the conflicting relations. Indeed, the presence of a conflict immediately implies that the groups involved disagree about the existing order. Would infra-humanization occur among low-status groups in the absence of conflict with out-groups? Infra-humanization theory does not hypothesize the necessary presence of conflict for the occurrence of infra-humanization from both low- and high-status groups. Indeed, the two kinds of groups are predicted to explain differences between groups by the attribution of different levels of human essence, and, because ethnocentrism is quasi-universal (Sumner, 1906), both high- and low-status groups should infra-humanize each other (Leyens et al., 2000). In the study presented below, status relationships (in addition to conflict) between the groups are also varied in order to verify this hypothesis.

The present paper looks at the impact of infra-humanization motivation upon reasoning in the Wason Selection Task (WST; Wason, 1968). After having presented the Wason selection task, motivated reasoning will be applied to this particular task. Finally, the specific hypotheses tested in the studies will be presented.

THE WASON SELECTION TASK

The "Wason Selection Task" (WST; Wason, 1968) was first designed to test deductive reasoning

in conditional statements of the type "if P, then Q." In the classical version of the WST, participants are presented with four cards and informed that each card has a letter on one side and a number on the other side. Only one side of each card is visible, the four showing respectively a vowel, a consonant, an even number, and an odd number. The participants' task is to select the cards that have to be turned over to verify a given rule such as: "If a card has a vowel (P) on one side, then it has an even number (Q) on the other side." According to formal logic, the correct answer is the selection of the P and non-Q cards (i.e., the vowel and the odd number). Indeed, for the rule to be true, there must be an even number behind the vowel (P) *and* there must not be a vowel on the other side of the odd number (non-Q). What is behind the consonant (non-P) and the even number (Q) is not relevant because the rule does not specify anything about what should be behind either of them. In general, only about 10% of the participants give the correct answer and many of these give it by chance (Fiedler & Hertel, 1994). The most popular answer is the selection of the P and Q cards. This response tends to confirm the rule and has been called a confirmation bias (Wason & Johnson-Laird, 1972); it also matches the linguistic elements contained in the rule and their choice is referred to as a "matching bias" by Evans (1972).

For decades, authors have investigated ways to boost performance on the WST. Specifically, a focus on content rather than process has been emphasized. Content of the rule improved performance by means of various factors, such as concreteness of the rule (Johnson-Laird, Legrenzi, & Legrenzi, 1972), familiarity with the rule and availability of counter-examples (Griggs & Cox, 1982), structure of the rule (e.g., Cheng & Holyoak, 1985), and social contracts within the rule (Cosmides, 1989). Other researchers have investigated reasoning with conditional statements using slightly different types of tasks, namely truth tables and inference. In both kinds of tasks, context has been shown to greatly influence participants' responses. Depending on the information contained in the rule, different inferences are drawn leading the respondents to different kinds of answers, although only one of them is true (Newstead, Ellis, Evans, & Dennis, 1997).

Motivated reasoning in the Wason Selection Task

If content of the rule primes different kinds of answers, introducing social variables such as groups and group characteristics could also have an impact on people's responses. This is precisely what Dawson, Gilovich, and Regan (2002) did to illustrate reasoning motivated to disconfirm an undesirable conclusion. Because the appropriate strategy for solving the four-card Wason selection task is to seek disconfirmation, the authors predicted that people motivated to reject a task rule should be more likely to solve the task than those without such motivation (Dawson et al., 2002). In their first study, for instance, their participants were categorized into two personality groups: high or low on emotional ability. They then received the conditional: "If high (or low) in emotional ability, then early death." Unsurprisingly, threatened participants selected their group and the card indicating "Late death." The authors' interpretation was that threatened individuals would make special efforts at reasoning and achieve the correct solution, contrary to nonthreatened participants. The problem with this interpretation is that the correct response for threatened persons was always a positive characteristic for their group. Did these participants reason better or was it important for them to appear in a positive light?

Scaillet and Leyens (2000; Scaillet, 2000) used the WST to study stereotypes in intergroup context. Their hypothesis was that introducing social variables such as groups (in-group vs out-group) and traits (positive vs negative) in the rule would have an impact on the interpretation of the conditional statement, which in turn would influence the selected cards. Different samples of participants received one of the four rules (in-group positive, in-group negative, out-group positive, and out-group negative) and a series of probing tasks aimed at investigating the reasoning process. Participants receiving the in-group negative rule could be considered threatened (situational threat was also induced naturally by the status of the out-group, or experimentally by priming). As in Dawson et al.'s (2002) research, a majority of participants threatened by the rule gave the correct response, and this percentage was still increased when the rule *and* the situation were threatening. Responses to the probing tasks revealed, however, that the responses were not due to correct reasoning (see also Fiedler & Hertel, 1994).

The specific strategy adopted by the participants to make their selection of cards became obvious when the social content of the cards instead of their logical status was taken into account. When responses to the four rules were aggregated, it turned out that participants overly selected in-group cards over out-group ones, and positive

cards over negative ones. This pattern of answers was especially pronounced in the case of situational threat. Such finding is in complete agreement with motivated reasoning. In particular, the motivation to arrive at a particular conclusion may determine the hypothesis people focus on or the manner in which they go about testing their hypothesis (Kruglanski, 1989; Kunda, 1990; Pyszczynski & Greenberg, 1987). Motivated reasoning implies two corollaries. First, motivation can influence social perceivers by focusing them on appropriate evidence supporting their desirable conclusion. Second, motivation can also influence social perceivers by inhibiting, or neglecting, inappropriate evidence supporting the undesirable conclusion. As Kunda and Sinclair (1999, p. 13) recently argued, ''Motivation can lead not only to the activation of helpful knowledge but also to the inhibition of disturbing knowledge; motivation can provoke the suppression of those knowledge structures that, if activated, might interfere with one's ability to draw a desired conclusion.''

Infra-humanization and the Wason Selection Task

Social psychological literature on intergroup relations differentiates between in-group favouritism and out-group derogation. Whereas the former process refers to the tendency to favour one's own group and to view it in a positive light, the latter implies a negative evaluation of the out-group (Brewer, 1999; Fein & Spencer, 1997). Leyens et al. (2003) argued that infra-humanization reflects the two biases. On the one hand, in-group members have the motivation to achieve the desirable conclusion that the in-group possesses the one human essence, and are especially concerned with associating it with uniquely human characteristics. On the other hand, in-group members want to avoid the undesirable conclusion that the out-group shares the same human essence as the in-group and, hence, are especially concerned with avoiding evidence supporting such a conclusion. This distinction corresponds to the two opposite sides of motivated reasoning, that is, focusing on the appropriate evidence and inhibiting inappropriate evidence (Kunda & Sinclair, 1999). Because of the way the task was designed, research using WST has only been able to test the former, that is, focus on the motivation-relevant cards for the participants. However, slight modifications in the implementation of the task could make it suitable for the study of both sides of social motivation. As will be fully detailed in the procedure section of the present study, it is possible to ask, given a conditional statement, which pair of cards is of most relevance to verify the rule and which pair is of least relevance. In other words, having participants rank ordering the importance of each pair of cards for the verification of the rule allows one not only to determine motivation of the desired conclusion one wants to achieve, but also motivation of the undesired conclusion one least wants to attain.

Responses to the WST involving social variables are likely to uncover social motivation. Consequently, it was decided to use this task to disentangle the two opposite motivations underlying infra-humanization. Because the focus of interest is not about positive and negative traits, but rather about emotions and infra-humanization, rules involving the participants' in-group or an out-group, and primary or secondary emotions, were adopted. In line with Scaillet and Leyens (2000), the first hypothesis is that participants should evaluate in-group secondary emotion cards as *more relevant* to verify the rule than out-group secondary emotion ones. Indeed, if people are motivated to achieve the desirable conclusion that the in-group possesses the human essence, then relevance of in-group and secondary emotions cards should be higher than relevance of out-group and secondary emotions cards. This effect should not be present for primary emotion cards because they do not permit participants to differentiate the in-group from the out-group on the human dimension.

To the same extent that the selection of the *most relevant* pair of cards reflects the preferred association of a specific characteristic with a particular group (Scaillet, 2000; Scaillet & Leyens, 2000), the selection of the *least relevant* pair should be a sign of disliking the association of a feature with a specific group, or at least a sign that such an association should be avoided. Indeed, since the social status of the cards acts as a pragmatic factor to guide participants' responses for the most relevant cards (Scaillet & Leyens, 2000), there is no reason to believe that it could not influence their answers to the least pertinent associations. Consequently, the second hypothesis predicts that, because in-groupers are motivated to avoid the undesirable conclusion that out-groups share humanity to the same extent that they do, participants will more often evaluate out-group secondary emotion associations as the least important ones to verify the rule. Once again, the difference between most and least important pairs of cards should not be present for primary emotion associations.

The WST has the great advantage of uncovering implicit processes. With the potential exceptions of radical racists and of people involved in an intense conflict, probably no one would explicitly admit that members of out-groups lack secondary emotions, or are infra-humans. This explicit response may be dictated by social desirability concerns or by the sincere conviction that everybody is equal. It is now a well-established fact that the removal of social desirability and of conscious control of one's reactions leads to so-called implicit responses, which often differ from explicit ones (Dovidio, Kawakami, & Beach, 2001). The WST is ideal for accomplishing such a removal. Because participants believe that they are solving a logical task, they are not preoccupied by social desirability, and because the task is highly demanding, they are unable to exert the control that would conform to their personal standards.

In conclusion, two hypotheses will be tested. (1) Motivation to achieve the desired conclusion that the in-group is essentially human will lead to the highest selection of the in-group secondary emotion pair of cards as the *most relevant* (important) pair to verify the conditional statement. Because primary emotions are not specifically associated with humanity, no such pattern should be observed for them. (2) Motivation to avoid the undesirable conclusion that the out-group shares the same humanity as the in-group will lead to the highest selection of the out-group secondary emotion pair of cards as the *least relevant* pair to verify the conditional statement. Again, no such pattern should be observed for primary emotions. These two hypotheses should hold regardless of the positive or negative valence of the emotions. Indeed, secondary emotions per se are considered uniquely human. Humanity is not restricted to positive, or negative, secondary emotions.

OVERVIEW OF THE STUDIES

To replicate and extend as much as possible the findings obtained with other paradigms in previous studies (for a review see Demoulin et al., 2005), the present paper reports four studies using the Wason Selection Task and varies the relations between groups and their respective status. The in-groups and out-groups were respectively: Canarians versus Mainland Spanish (Study 1); Belgian Walloons versus French (Study 2); Belgian Walloons versus Belgian Flemish (Study 3); and Americans versus Mexicans (Study 4). In the first three studies the in-group has a lower status than the out-group. It is the reverse in Study 4. On the other hand, Canarians resent Mainland Spanish, while the long history of conflict between the Flemish and Walloons still exists, but more at the political than the personal level. There is no conflict between the groups involved in Studies 2 and 4.

Method

Participants

About 1000 undergraduate participants from Belgium, Spain, and the United States were tested over the four studies. They completed the questionnaire in class. Incomplete questionnaires were discarded[1].

Material

Emotions. Positive and negative pairs of primary and secondary emotions were selected from a large pool of emotional stimuli (Demoulin et al., 2004). Primary and secondary emotions were selected by pairs such that, for a selected pair, emotions have the same valence but differ in the extent to which they are perceived as uniquely human emotions. Pre-testing were conducted in Belgium, Spain, and the United States (Demoulin et al., 2004). Table 1 presents all the emotional pairs that were selected.

Rules. Four types of rule were constructed. Each rule always contained a group (in-group vs out-group) component and an emotion (primary vs secondary) one.

> "If s/he is (in-group), then s/he is (secondary emotion)."
>
> "If s/he is (in-group), then s/he is (primary emotion)."
>
> "If s/he is (out-group), then s/he is (secondary emotion)."
>
> "If s/he is (out-group), then s/he is (primary emotion)."

Procedure

Questionnaires were randomly assigned to the participants. In each study, equal numbers of participants received one of the four rules (see Table 2 for number of completed questionnaires in each study, *N*s). Each rule was followed by four

[1]No detectable pattern in the uncompleted questionnaire suggested that one condition was abandoned more frequently than others.

TABLE 1
Primary and secondary emotions' valence scores derived from Demoulin and colleagues (2001) as a function of the study

Study	*Primary emotion*	*Valence of primary emotion*	*Secondary emotion*	*Valence of secondary emotion*
Study 1	Alegria (*joy*)	6.93	Amistad (*friendship*)	6.91
	Placer (*pleasure*)	6.63	Felicidad (*felicity*)	6.81
Study 2	Joie (*joy*)	6.69	Bonheur (*happiness*)	6.64
	Joie (*joy*)	6.69	Tendresse (*tenderness*)	6.77
	Plaisir (*pleasure*)	6.41	Bonheur (*happiness*)	6.64
	Plaisir (*pleasure*)	6.41	Amour (*love*)	6.54
	Emerveillement (*amazement*)	6.10	Admiration (*admiration*)	5.62
	Jouissance (*lust*)	5.68	Admiration (*admiration*)	5.62
	Agressivité (*aggression*)	2.00	Déception (*deception*)	2.14
	Agressivité (*aggression*)	2.00	Amertume (*bitterness*)	2.34
	Douleur (*pain*)	2.36	Amertume (*bitterness*)	2.34
	Colère (*anger*)	4.08	Amertume (*bitterness*)	2.34
	Peur (*fear*)	2.87	Indignation (*indignation*)	2.72
Study 3	Joie (*joy*)	6.69	Bonheur (*happiness*)	6.64
	Plaisir (*pleasure*)	6.41	Bonheur (*happiness*)	6.64
	Jouissance (*lust*)	5.68	Admiration (*admiration*)	5.62
	Agressivité (*aggression*)	2.00	Amertume (*bitterness*)	2.34
	Colère (*anger*)	4.08	Amertume (*bitterness*)	2.34
	Peur (*fear*)	2.87	Indignation (*indignation*)	2.72
Study 4	Attraction	6.00	Admiration	5.62
	Anger	2.59	Resentment	2.11
	Sadness	2.44	Humiliation	2.51

cards; two group cards (in-group and out-group) and two emotion cards (primary and secondary emotions). One of the emotion cards was the one presented in the rule. The second one was the other emotion of the selected pair, as explained above. Importantly, as stated above, the other emotion of the pair was always of the same valence as the emotion presented in the rule. Stated otherwise, participants could not answer according to a positivity bias (Scaillet & Leyens, 2000) because valence was kept constant within a rule. Valence, however, was varied across rules. That is, some rules involved positive emotions and some rules involved negative emotions. As no difference was obtained between positive and negative emotion rules in any of the studies, this variable will not be elaborated further.

Study 1 followed the classical method of WST investigations. Participants were instructed to select two out of the four possible cards—the two cards that were needed to verify the rule. This method, however, is suitable for showing relevance (the cards considered to be important) but not irrelevance (the cards considered to be useless).

To differentiate between relevance and irrelevance, a different procedure was used in

TABLE 2
Frequency scores of relevance and irrelevance as a function of group and emotion type

Study	*Out-group Secondary emotion*	*In-group Secondary emotion*	*Out-group Primary emotion*	*In-group Primary emotion*	*Total*
			Relevance		
Study 1	15	39	19	22	95
Study 2	56	93	95	94	338
Study 3	78	88	83	84	333
Study 4	18	31	28	29	106
Total	167	251	225	229	872
			Irrelevance		
Study 2	117	58	69	68	312
Study 3	109	69	87	68	333
Study 4	35	20	27	24	105
Total	261	147	183	160	750

subsequent studies (Studies 2, 3, & 4). Cards to be judged were presented *in pairs* to the participants. Participants were asked to point out which pair of cards (in-group secondary emotion; in-group primary emotion; out-group secondary emotion; out-group primary emotion) was of the utmost importance to verify the rule (relevance) and which pair was of no importance at all (irrelevance). These two responses are relatively independent: To assign relevance for the association of a certain type of emotion with one group *can*, but *need not*, be combined with the assignment of irrelevance of this same emotion's association with the other group.

RESULTS

Relevance

Given that the results over the four rules used in the studies were aggregated, each of the four card combinations should be selected an equal number of times if the participants respected either the formal logical answer or the matching (or confirmation) bias.

As expected, the results, summarized in Table 2, clearly showed no differential relevance for the association of primary emotions with one of the two groups. None of the differences were significant. Importantly, consistent with hypothesis (1), the associations of secondary emotions with the in-group were more relevant than their associations with the out-group, overall $\chi^2(1) = 16.88$, $p < .005$. Stated otherwise, whichever the rule, the number of participants who chose associations between in-group and secondary emotions as the most relevant pairs of cards was higher than the number of participants who chose association of out-group and secondary emotions as the most relevant. Looking separately at the different studies, the results of three of them were significant, $\chi^2(1) = 10.66$, $p < .005$; $\chi^2(1) = 9.18$, $p < .005$; $\chi^2(1) = 3.44$, $p < .08$, for Studies 1, 2, and 4 respectively. The frequencies of Study 3 go in the right direction but are not significant. Overall, participants showed motivation to achieve the desirable conclusion, that the in-group is seen as especially human, by an in-group favouritism bias in the selection of the *most important* cards. They chose the in-group more often than the out-group in association with secondary emotions.

Notwithstanding these consistent results across studies, one has to verify whether the pattern of card selection differs across the various rules. Table 3 shows the preference rates broken down by the type of rules being verified. Italic results indicate the association of cards that would have been selected if participants were influenced by the classical "matching bias." A first cursory look at these data shows that, for every rule, and as expected, the in-group secondary emotion pair is more relevant than the out-group secondary emotion one. Consistent with previous research (Evans, 1972), responses show a slight matching bias. For the hypothesis to be fully demonstrated, one has to make sure that the motivated bias is more important than the matching bias. To verify this hypothesis, we compared how often the out-group secondary emotion pair was selected when the rule involved the out-group possessing a secondary emotion (56) to how often the in-group secondary emotion pair was selected when the rule involved the in-group possessing a secondary

TABLE 3
Frequency scores of relevance and irrelevance as a function of group, emotion type, and kind of rule

Rule	*Out-group Secondary emotion*	*In-group Secondary emotion*	*Out-group Primary emotion*	*In-group Primary emotion*
		Relevance		
"If out-group, then secondary emotion"	56	64	54	38
"If in-group, then secondary emotion"	33	84	52	56
"If out-group, then primary emotion"	39	56	62	57
"If in-group, then primary emotion"	39	47	57	78
Total	167	251	225	229
		Irrelevance		
"If out-group, then secondary emotion"	78	32	37	38
"If in-group, then secondary emotion"	60	53	37	38
"If out-group, then primary emotion"	54	35	66	37
"If in-group, then primary emotion"	69	27	43	47
Total	261	147	183	160

emotion (84). Results show that the relevance rates of out-group secondary emotion card and in-group secondary emotion card differ highly for these two rules, $\chi^2 = 6.02$, $p < .02$. In other words, despite the presence of a pervasive matching bias, whatever the rule is, a motivated bias for in-group secondary emotion cards is observed.

Irrelevance

As expected, aggregated results of the least important cards, reported in Table 2, indicate no differential irrelevance for primary emotions' associations with in-groups and out-groups. None of the results reached significance.

Importantly, and consistent with the hypothesis, secondary emotions' associations with out-groups were more often qualified as irrelevant than the associations of the same emotions with in-groups, $\chi^2(1) = 19.8$, $p < .001$; $\chi^2(1) = 12.3$, $p < .001$; $\chi^2(1) = 3.62$, $p < .07$ for Studies 2, 3, and 4 respectively. In other words, in all three experiments, evidence of motivation to avoid the undesirable conclusion that the out-group shares the same humanity as the in-group was present; that is, participants chose the out-group more than the in-group in association with secondary emotions as the least pertinent cards to verify the rule.

The irrelevance rates broken down by the rules are presented in Table 3. For every rule, irrelevance was more important for the out-group secondary emotion answer than for the in-group secondary emotion. Similarly to in the relevance section, we verified whether the irrelevance of secondary emotions' associations with out-groups was still present when the rule involved an out-group possessing a secondary emotion. To do so, the irrelevance rates of out-group secondary emotion cards when the rule involved an out-group possessing a secondary emotion (78) were compared to the irrelevance rates of in-group secondary emotion cards when the rule involved an in-group possessing a secondary emotion (53). Results indicate that the irrelevance rates of out-group and in-group secondary emotion cards differ highly for these two rules, $\chi^2 = 7.99$, $p < .01$. Stated otherwise, secondary emotions' associations with out-groups are more often qualified as irrelevant than the associations of these emotions with in-groups in their respective "matching rules."

DISCUSSION

This paper focused on out-groups' infra-humanization, a topic neglected until very recently. It may appear surprising that a social outcome, such as infra-humanization, can be illustrated by a cognitive task created to test deductive reasoning. The paradox is only apparent. As many WST studies have shown, thinking does not occur in a social vacuum. By introducing social information into the rules, numerous researchers have succeeded in increasing the number of logical answers. Importantly, Scaillet and Leyens (2000) have consistently shown that conditional statements including in their phrasing groups and traits lead to the resolution of the rule in terms of in-group favouritism. In other words, the social status of the cards act as pragmatic factors in the selection process such that participants' answers support the desired conclusion of positive distinctiveness for the in-group.

In the present study, it was hypothesized that people focus their attention on social information supporting the desired conclusion that the in-group possesses the one human essence (relevance hypothesis). More importantly, it was also suggested that participants would be especially non-reactive to social information supporting the undesirable conclusion that the out-group shares the in-group's human essence (irrelevance hypothesis). As in previous studies (for reviews see Demoulin et al., 2005; Leyens et al., 2003), humanity was operationalized through the use of uniquely human, secondary emotions.

The relevance hypothesis was verified in three out of the four studies. Except for Study 3, in-group secondary emotion associations were selected more often as the most pertinent ones than out-group secondary emotion associations. Primary emotions were not associated more often with either of the two groups. These results nicely replicate other findings on attribution of secondary emotions to groups, which used different paradigms (Gaunt et al., 2002; Leyens et al., 2001).

More to the point of this paper is the exceptional consistency of the irrelevance of secondary emotions' associations with out-group members. Despite the differences of languages, stimuli, status, and conflict relationships between the groups, the results obtained in the three studies testing irrelevance showed the same pattern of answers. In comparison with what they did for their in-group, participants tended to qualify as irrelevant associations between secondary emotions and the out-group. This difference was important. Again, no such pattern was observed for primary emotions.

The present research, however, has some limitations. First, relevant and irrelevant responses are partially dependent on one another. Stated

otherwise, once a particular pair has been chosen as the most relevant one, it cannot possibly be chosen as the *least* relevant one (although results for irrelevance are still worth analysing since three alternatives still remain for the selection of irrelevant cards). It should be important, in further research, to assess relevance and irrelevance independently in a between-participants design. Second, no independent data is available to ascertain the construct validity of the two indicators. By varying the desirable or undesirable content of the rules, Dawson et al. (2002) have shown that the choice of cards in the WST can indeed be the result of a specific motivation. Nevertheless, in the future, measures of motivation should be included in order to verify that people are indeed motivated to achieve the conclusion that the in-group is essentially human and to discount the conclusion that the out-group is essentially as human as the in-group.

Earlier research on infra-humanization has consistently shown a pattern of attributing uniquely human characteristics to members of the in-group. This paper goes further and suggests that, when confronted with uniquely human material, two opposite motivations influence participants' behaviour. First, people are mostly motivated to support the desirable conclusion that the in-group possesses the one human essence. Accordingly, their attention is focused on the information susceptible to confirm such a desirable conclusion, that is, in our experiments, the association between secondary emotions and the in-group. Second, people are least motivated to confront the undesirable conclusion that the out-group shares the same human essence previously attributed to the in-group. Accordingly, information likely to support such an undesirable conclusion, that is, associations between the out-group and secondary emotions, is qualified as irrelevant.

The distinction between high and low relevance is evocative of other distinctions in the intergroup literature such as in-group favouritism and out-group derogation (Brewer, 1999, 2001; Perdue, Dovidio, Gurtman, & Tyler, 1990), in-group overexclusion and out-group vigilance (Leyens & Yzerbyt, 1992), and the positive–negative asymmetry (Wenzel & Mummendey, 1996). What is at stake, in all these denominations, is the distinction between protecting the in-group and harming the out-group. Are people exclusively concerned with their own group and, hence, motivated to highlight it with positive features? Are people preoccupied by the out-group's status and its position in the world and, hence, motivated to derogate it? Or, are people preoccupied by both consequences at the same time? For instance, the positive–negative asymmetry suggests that the primary concern is for the in-group to be associated with positive features. Rather than a direct attack against the out-group, an increasing number of researchers now defend the idea that what is important is the in-group itself and, specifically, its protection from outsiders (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993; Sears, 1988; Smith, 1993; Yzerbyt, Castano, Leyens, & Paladino, 2000). Discrimination, therefore, is first of all a concern about the purity of one's own group versus "others" (Schatz & Staub, 1997). Racists do not like the presence of foreigners because these "others" could tarnish the purity of the in-group; remember that the old word "*mulatto*" derives from a Spanish word designating a mule, that is, the hybrid, by definition sterile, between a horse and a donkey. This position is also sustained by the relative easiness to observe in-group favouritism in laboratories compared to the relative difficulty of obtaining out-group derogation behaviours.

As far as infra-humanization is concerned, the present article suggests that both kinds of bias occur at the same time. Indeed, results show that people do favour their in-group by selecting the pair of cards that associate it with secondary emotions. At the same time, people also underselect associations of the out-group with secondary emotions. It is important to point out that these two biases appeared partially independently of one another. Indeed, people could have preferred the in-group secondary emotion pair of cards and rank ordered all remaining pairs with an equal frequency. Similarly, people could have underselected out-group secondary emotions associations and rank ordered all remaining pairs with an equal frequency. The consistency of the results, replicated cross-culturally, suggests that people favour their in-group and derogate out-groups on the humanity dimension at the same time. This exceptional consistency of the occurrence of both biases could be due to the particular dimension being used. Clearly, associating groups with emotions is not as much affected by social desirability concerns (Gaertner & Insko, 2001) as is associating groups with positive or negative characteristics. As such, infra-humanization through emotional attribution appears to be a very powerful and unobtrusive measure for the study of intergroup discrimination. Finally, specific to the WST, people are convinced in their own minds that they are solving a test measuring their reasoning abilities. Therefore, they are less likely to attempt to control for social desirability

and, hence, allow the emergence of deep implicit biases.

Besides showing the simultaneous presence of in-group favouritism and out-group derogation, the results of the present set of four studies add knowledge about the interdependent and structural group factors that lead to infra-humanization. Replicating earlier findings (Cortes et al., 2005; Leyens et al., 2001; Paladino et al., 2002, Expt. 4), Studies 1 and 3 showed that low-status groups infra-humanize high-status out-groups with which they have conflicting relations. Studies 2 and 4 verify that such conflicting relations between groups do not constitute a necessary factor to induce infra-humanization.

Since infra-humanization comprises out-group derogation, this finding extends knowledge of the conditions to this latter phenomenon. Indeed, it has traditionally been thought that out-group derogation requires some degree of conflict (Brewer, 1999; Mummendey & Otten, 1998). This requirement is unnecessary in the case of infra-humanization. Both high- and low-status groups infra-humanize out-groups even in the absence of conflict. Such observation may not appear too surprising for a high-status group (Study 4). By infra-humanizing a lower-status out-group, the dominant group may be thought of as reflecting the reality and legitimizing it (Jost & Major, 2001). Legitimacy of different positions in the societal hierarchy is provided by the fact that the dominant group has more uniquely human emotions, that is, it is more human than the low-status group. Dominated groups also infra-humanize higher-status out-groups in the absence of conflict (Study 3). Such observation contradicts the conception that dominated groups contribute to the status quo of the society by accepting and internalizing the standards of dominant groups (Jost & Banaji, 1994; Jost & Hunyady, 2002). There is no question that social hierarchies exist and that "legitimizing myths" circulate in order to support them (Sidanius & Pratto, 1999). It does not ensue that dominated groups will necessarily adopt these legitimizing myths (Federico & Levin, 2004). In fact, low-status groups do not escape ethnocentrism (Sumner, 1906), and they are as likely as dominant groups to claim a greater human essence for themselves than for out-groups. It is likely that these low-status groups will not be able to claim more intelligence and better language than high-status ones (Leyens et al., 2001). Earlier research (see Leyens et al., 2003) has shown that dominated groups attribute more competence to dominant groups than to themselves, but equal intelligence. When it comes to secondary emotions, nothing prevents members of a low-status group claiming more for their in-group than for the dominant group.

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