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FACIAL MAKE-UP ELICITS POSITIVE ATTITUDES AT THE IMPLICIT LEVEL: EVIDENCE FROM THE IMPLICIT ASSOCIATION TEST

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ABSTRACT

Three experiments tested whether the use of facial make-up elicits positive or negative implicit attitudes. Students in psychology, business, and aesthetics performed a series of Implicit Association Tests (IAT) measuring the link between portrayed women wearing or not wearing make-up and high versus low status professions, pleasant versus unpleasant words, and positive versus negative personality traits. Results showed that make-up was associated with positive traits and high-status professions at the implicit level. They are discussed in relation with previous findings indicating a negative influence of make-up on impression formation with exactly the same photographs and similar subject samples.

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INTRODUCTION

Whereas social psychology has intensively examined how people form impressions about one another, the impact of cosmetic use on such impressions has not received much attention. This is surprising because, as reported by Cash and Cash (1982), U.S. consumers spent billions of dollars on cosmetics as a means to develop and/or maintain an attractive appearance. There is no doubt that, in the users' eyes, cosmetic use increases their attractiveness and therefore improves how others perceive them. Is this use always beneficial, however?

Huguet, Croizet, and Richetin (in press) pointed out that the small number of studies in this area produced inconsistent findings. As early as 1952, McKeachie reported data indicating that

cosmetic use can result in negative impressions. Young male students rated young women (students) as more frivolous, less talkative, more anxious, less conscientious, and more interested in the opposite sex when wearing make-up than when not. Thirty years later, Graham and Jouhar (1981) reported positive effects of cosmetics. Male and female participants rated color photographs of four female targets of average physical attractiveness on several traits related to appearance and personality. With facial make-up, the targets were rated as being cleaner, more tidy, feminine, physically attractive, and mature looking (appearance ratings) as well as being more secure, sociable, interesting, poised, confident, organized and popular (personality ratings). As suggested by Graham and Jouhar, to the extent that the use of cosmetics induced more favorable impressions on the appearance ratings, its positive influence on the personality ratings could be the indirect effect of an increase in the target's Physical Attractiveness (PA). We (Huguet et al., in press) tested this idea by the means of mediational analyses and found that cosmetic use (i.e., ordinary facial make-up) had a direct effect on perceived personality, independent of PA enhancement. This direct effect was also suggested by Graham and Jouhar as an alternative hypothesis of a positive cosmetic stereotype, which would be independent of the PA or "what-is-beautiful-is-good" stereotype (see Dion, Berscheid, & Walster, 1972; Eagly, Ashmore, Makhijani, & Longo, 1991; Feingold, 1992). In our previous investigation, however, make-up had a negative (not a positive) impact on impression formation. More specifically, undergraduates from three different academic areas (i.e., Psychology, Business, and Aesthetics) were presented with photographs (on a computer screen) of young and older female stimulus wearing or not wearing ordinary facial make-up. They were asked to rate them for physical attractiveness and on a number of personality traits (the presence or absence of make-up was never emphasized by the experimenter). For the three group of participants, make-up facilitated the attribution of negative traits (i.e., vain, unfaithful and shallow) and inhibited the attribution of positive traits (i.e., kind and honest), especially for the young targets.

Of particular interest here, Graham and Jouhar selected professional business people (i.e., directors, secretaries, and personal managers) as participants. And a close examination of past relevant studies revealed that the negative effects of cosmetics were typically observed with Psychology undergraduates (e.g., Workman & Johnson, 1991). In our previous investigation, the negative impact of make-up on impression formation was indeed stronger with the Psychology undergraduates than with the other participants (from Business and Aesthetic schools), especially those studying Aesthetics who are indeed trained to use and value cosmetics. Consistent with this, participants' explicit attitude toward facial cosmetics was less positive in the Psychology group than in the Aesthetic group. It is therefore possible that cosmetic use has a different meaning for different social groups (or for different age groups), and that the selection of different populations is, at least in part, the cause of the inconsistency in this literature.

In the present paper, it is assumed that this inconsistency also stems from the fact that past relevant research relied exclusively on explicit measures of judgment, which are known to be opened to various bias (e.g., demand characteristics, impression management, see Orne, 1962; Tedeschi, Schlenker & Bonoma, 1971). No research so far has measured the impact of cosmetic use unobtrusively. In order to fill in this gap, the present studies relied on the Implicit Association Test (IAT, Greenwald, McGhee & Schwartz, 1998). Our goal was to determine whether facial make-up is associated with a positive or a negative attitude at the implicit level.

IAT AND ATTITUDE TOWARD COSMETICS

The IAT is generally viewed as offering direct access to people's attitudinal unconscious (Greenwald, Banaji, Rudman, Farnham, Nosek & Mellott, 2002). As such, this test may reveal attitudes and other automatic associations even for subjects who prefer not to express those attitudes. As noted by Greenwald et al. (1998), implicit attitudes are manifest as actions or judgments that are under the control of automatically activated evaluation. The IAT is therefore similar in intent to cognitive priming procedures for measuring automatic affect or attitude (e.g., Bargh, Chaiken, Gower, & Pratto, 1992; Fazio, 1993). In the first and second step of this test, participants simply indicate via a motor action whether a stimulus (e.g., photo of human faces) does or does not belong to a given category (e.g., Black vs. White people), then whether words are positively or negatively connoted. These two tasks are interspersed at step 3, in which both types of stimuli (i.e., faces and words) occur on alternate trials. At step 4, participants learn a reversal of response assignment for the face categorization task (i.e., people perceived as Black are now assigned to the opposite key). Finally, at step 5, they perform a task combining the one from step 2 (i.e., word categorization not changed in response assignment) with the reversed face categorization task from step 4. When participants respond under time pressure, they typically produce higher response latencies and more errors if stimulus and response are incompatible than if they are compatible. This performance difference constitutes the indication of the implicit attitude towards the target categories (e.g., Black or White) and has been labeled the IAT effect. The IAT has been massively used to reveal negative implicit attitudes toward different social categories (e.g., Greenwald et al, 1998; Greenwald & Farnham, 2000; Karpinski & Hilton, 2001). In line with our example, White participants associate "pleasant" words and typical White names more readily than they associate "pleasant" words and typical Black names. The differential ease with which pleasant words are associated with typical White names rather than Black names reflects an automatic preference for the racial category "White" relative to "Black," that is, a biased racial attitude.

Despite the apparent robustness of automatic attitudes biases, they may be quite malleable to contextual influences (Richeson & Ambady, 2003). For instance, imagining an agentic woman reduced automatic gender stereotyping (Blair, Ma, & Lenton, 2001), and exposure to a Black experimenter reduced White's automatic racial biases (see also Rudman, Ashmore, & Gary, 2001). Dasgupta and Greenwald (2001) also found that White and Asian American participants revealed less implicit prejudice regarding Blacks during an IAT if they had recently been exposed to admired Blacks (e.g., Michael Jordan) and disliked Whites (e.g., Jeffrey Dahmer), compared to recent exposure to disliked Blacks (e.g., Mike Tyson) and admired Whites (e.g., John F. Kennedy). In addition, Richeson and Ambady (2003) provided evidence for the influence of situational power on automatic racial prejudice. Specifically, Whites assigned to the high-power role of a superior of a Black individual revealed more racial bias than Whites assigned to the lower-power role of a subordinate. Thus, although they are typically activated without conscious awareness, the prejudicial attitudes and stereotypical associations revealed by the IAT are not automatic in the sense of being inevitable. Instead, they can be disabled and/or overridden by contextual factors (see also Besner, 2001; Huguet, Galvaing, Monteil, & Dumas,

1999; Huguet, Dumas, & Monteil, in press, for a similar argument about automatic lexical-semantic analyses of isolated words).

With this in mind, we performed three IAT experiments using the same photographs of female faces wearing or not wearing make-up as previously (Huguet et al., in press). In order to know whether make-up is implicitly associated with a negative or a positive evaluation, we used these photographs in combination with pleasant versus unpleasant words (e.g., sun vs. poison; see Study 1), with positively versus negatively connoted personality traits (e.g., sociable vs. stupid; see Study 2 and Study 3), and with words related to high-versus low-status professions (e.g., judge vs. hairdresser, all three studies). The central question underlying the three studies was whether there is a differential ease with which facial make-up is associated with pleasant rather than unpleasant words, positive rather than negative personality traits, or high rather than low status professions. As done in Huguet et al. (in press) and for comparative purpose with previous research, participants were selected from the same three academic areas (Psychology, Business, or Aesthetics).

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GENERAL METHOD (STUDIES 1 TO 3)

Participants

Overall, we selected 98 undergraduates (76 females and 22 males, median age = 20,7) as participants, all from the same French city (Clermont-Ferrand). In Study 1, they were 41 from the introductory psychology subject pool of the University Blaise Pascal. In Study 2, they were 28 from a business school. In Study 3, they were 29 from an aesthetic school. The three studies were run separately. All participants voluntarily agreed to take part in our investigation presented as a research project on make-up use. They received no credit for their participation.

Procedure

In each study, the participants arrived individually, were greeted by a female experimenter, and were seated in front of a computer. They were informed that they would perform a task that would involve indicating the presence or absence of make-up on human faces as well as classifying words on the basis of a given dimension. In each study, color photographs of adult female faces were used. These faces were of average attractiveness (as revealed by a pretest) and were unknown from the participants. A professional photographer portrayed in color (10 x 13 cm) women with and without ordinary facial cosmetics, resulting in 24 photographs. Make-up was applied by a professional aesthetician in order to control for inter-individual differences that may occur when cosmetics are self-applied (Cash, Dawson, Davis, Bowen & Galumbeck, 1989). As in Graham and Jouhar's (1981) moderate cosmetics condition, each target's facial make-up consisted of foundation, eye shadow, eyebrow pencil, mascara, powder, rouge, and lipstick applied in moderate quantity (as stated by the professional). Pictures were standardized with respect to gaze direction (straight into the camera) and facial expression (neutral). No jewelry, no

spectacles and no hair adornments were worn and all factors were held as constant as possible across conditions and across targets.

In each study, the IAT focused on the implicit association between facial make-up and high-versus low-status professions (e.g., "lawyer" vs. "salesman"). The test followed the usual five steps-sequence: (1) Initial target-concept discrimination (i.e., absence vs. presence of make-up), (2) evaluative attribute discrimination (e.g., high status vs. low status professions, see Appendix 1), (3) first combined task, (4) reversed target-concept discrimination, and (5) reversed combined task. In Study 1, another IAT focused on the association between make-up and pleasant versus unpleasant words ("holiday" vs. "cancer," see Appendix). In the two other studies, the additional IAT focused on the association between make-up and positively versus negatively connoted personality traits ("intelligent" vs. "shallow," see Appendix). After any incorrect response, a cross appeared on the center of the screen during 300 ms. For each step, response time (RT) and error rate (ER) were recorded. The differences in RT and ER during Steps 3 and 5 constituted the primary dependent variables in the present work.

We counterbalanced ordering of IAT measures (professions first vs. words or traits first) and the assignment of response modalities concerning the discrimination of make-up presence (right key first vs. left key first). Because we did not know the valence of the evaluative consistency before the experiment, we could not manipulate it (see also Karpinski & Hilton, 2001). This being said, some readers might wonder whether this really matters in the present studies. After all, Greenwald et al.'s (1998) Study 1 is the only one that showed an order effect (evaluative consistency first vs. evaluative inconsistency first) altering the strength of the IAT effect, but without eliminating or reversing it. Other studies demonstrated no influence of this order on the IAT effects (e.g., Rudman, Greenwald, Mellott & Schwartz, 1999). In the present studies, the instruction on the first combined task (step 3) always required to press the same key for responding that a face belonged to the category "make-up" and that professions belonged to the category "high-status" (or that words were pleasant or personality traits positively connoted). In contrast, the instruction on the reversed combined task (step 5) always required to press the same key for responding that a face belonged to the category "make-up" and that professions belonged to the category "low-status" (or that words were unpleasant or personality traits negatively connoted).

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Once the last IAT session ended, the participants completed an "Attitude Toward Cosmetics Scale" (ATCS), the same as the one used in our previous investigation (Huguet et al., in press). We simply asked them to indicate the extent to which they agree or disagree with 13 statement items measuring their explicit attitude toward the use of facial make-up in women. The scale included 6 positive (e.g., "a woman who wears make-up is pleasant looking") and 6 negative (e.g., "most of women need not make-up") items about this use. Each of the 7-point scales accompanying these items was anchored by "not at all" (1) at one end, and "very much" (7) at the other. On the last item, participants indicated whether "make-up is positive or negative" for them, personally. This scale was implemented in order to know whether explicit measures toward facial cosmetics do or do not correlate with the implicit measures investigated here. If the IAT really captures implicit attitudes, no correlation should be found (Greenwald et al., 1998).

Finally, participants were required to report their gender and age. They were then thanked and dismissed.

RESULTS

Data Reduction

Outlying values typically indicate responses initiated prior to perceiving the stimulus (anticipations) and momentary inattention. As in other studies (e.g., Greenwald et al., 1998), values below 300 msec (0.33% for Study 1, 0.04% for Study 2, and 0.26% for Study 3) were recoded to 300 msec and those above 3000 msec (0.64% for Study 1, 0.67% for Study 2, and 0.50% for Study 3) to 3000 msec.

IAT Effects. For each study, we examined RT and ER in a 5 (Step: 1 to 5) x 2 (Order of IAT measures: professions first vs. words or traits first) x 2 (Response modality concerning the discrimination of make-up: right key vs. left key first) mixed ANOVA. The last two factors were between-subjects. Because they had no significant effects on RT or ER, we will ignore them in the next sections of this paper.

Study 1 (Psychology Students)

Association Between Make-Up And High-Versus Low-Status Professions

The RT and ER data are reported in Table 1. First of all, there was a step effect on RT: $F(4, 100) = 9.00, p < .001$ (partial eta-square = .27). An IAT effect was found: $t(28) = -2.44, p < .05$. Participants were faster on the combined task (Step 3), that is when the instruction required them to share the same key for responding that a face belonged to the category "wearing make-up" and that professions belonged to the category "high-status," than on the reversed combined task (Step 5). There were also step effects on ER: $F(4, 100) = 30.82, p < .001$ (partial eta-square = .55). However, no significant IAT effect was found on errors: $t(28) = .03$ (ns).

Association Between Make-Up And Pleasant Versus Unpleasant Words

The RT and ER data are also reported in Table 1. There was a significant step effect on RT: $F(4, 100) = 7.81, p < .001$ (partial eta-square = .24), but no IAT effect, $t(28) = -1$ (ns). Likewise, there was a step effect on ER, $F(4, 100) = 18.97, p < .001$ (partial eta-square = .75), but no IAT effect: $t(28) = -1$ (ns).

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Table 1. Reaction Times and Error Rates for Each Step of the Implicit Association Test and for the Association between Make-Up and High- versus Low-Status Professions and the Association between Make-Up and Pleasant versus Unpleasant Words (Study 1, Psychology Students)

Make-up and Professions				Make-up and Words			
RT	Step	M	SD	RT	Step	M	SD
	1	1059	175.9		1	1059	175.9
	2	1003	189.3		2	945	159.1
	3	947	132.3		3	1012	257.4
	4	899	169.8		4	911	169.1
	5	1021	173.8		5	1016	211.5
ER	Step	M	SD	ER	Step	M	SD
	1	5.31	2.66		1	5.3	2.66
	2	0.48	0.83		2	0.45	0.74
	3	3.21	2.4		3	3.69	3.47
	4	2.52	2.16		4	2.79	2.55
	5	3.17	2.28		5	3.86	4.35

Note: All times are reported in milliseconds.

ATCS (Or Explicit Judgments) Data

Cronbach's Alpha-value of the ATCS items (.80) was satisfying. Participants' responses were therefore averaged to form an attitudinal index. One-sample t-tests performed on this index then revealed that Psychology students' explicit attitude toward make-up ($M = 3.7$, $SD = .93$) did not differ from the midpoint (3.5) of the scale.

Correlation Between The IAT And ATCS Data

As expected, the critical difference score on RT between Step 3 and Step 5 (IAT effect) and the ATCS data (attitudinal index) did not significantly correlate with each other ($r_s = .15$ and $.02$ --both ns--for the correlation using professions and words, respectively). No significant correlations were found either when using the corresponding difference score on ER.

Discussion

As noted earlier in this paper, the more negative effects of make-up on impression formation were typically observed with Psychology students (e.g., Huguet et al., in press; Workman & Johnson, 1991). In the IAT paradigm, therefore, such students should be especially likely to associate make-up with negative rather than positive attributes. Instead, the present data indicate that, for the psychology undergraduates, facial make-up is in fact associated with high- rather than low-status professions at the implicit level. Although no IAT effect was found when using pleasant (vs. unpleasant) words, the critical RT difference between step 3 and step 5 was in the same direction as the one found with professions. One may wonder whether the significant IAT effect on professions really did imply implicit cognitive associations. As expected, however, the

corresponding RT difference did not correlate with the students' explicit attitude toward make-up, suggesting that these associations were indeed more implicit than explicit. The implicit association between make-up and high status professions in students who are yet the most likely to produce negative judgments about women wearing make-up is surprising. For clarity, we will return to this association in the general discussion.

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Study 2 (Business Students)

Association Between Make-Up And High-Versus Low-Status Professions

The RT and ER data are reported in Table 2. There was a step effect on RT: $F(4, 132) = 13.31, p < .001$ (partial eta-square = .28). The same IAT effect as before was found: $t(41) = -4.59, p < .001$: Participants were faster on the combined task (Step 3), or when the instruction required them to share the same key for responding that a face belonged to the category "wearing make-up" and that professions belonged to the category "high-status," than on the reversed combined task (Step 5). There was also a step effect on ER: $F(4, 132) = 21.46, p < .001$ (partial eta-square = .39). As before, no significant IAT effects were found on errors: $t(40) = 1.23$ (ns).

Association Between Make-Up And Positive Versus Negative Personality Traits

The RT and ER data are also reported in Table 2. There was a step effect on RT: $F(4, 132) = 8.69, p < .001$ (partial eta-square = .21). The IAT effect on traits was also clearly significant: $t(40) = -2.49, p < .02$. Consistent with the IAT effect on professions, participants were faster on the combined task (Step 3), or when the instruction required to press the same key for responding that a face belonged to the category "wearing make-up" and that a trait was positive, than on the reversed combined task (Step 5). There was also a step effect: $F(4, 132) = 23.2, p < .001$ (partial eta-square = .41). Once more, no IAT effect was found on errors: $t(40) = .72$ (ns).

Table 2. Reaction Times and Error Rates for Each Step of the Implicit Association Test and for the Association between Make-Up and High- versus Low-Status Professions and the Association between Make-Up and Pleasant versus Unpleasant Words (Study 2, Business Students)

Make-up and Professions				Make-up and Personality traits			
RT	Step	M	SD	RT	Step	M	SD
	1	1121	266.6		1	1121	266.6
	2	997	188.4		2	1060	215.6
	3	946	223.2		3	1072	299.4
	4	963	250.2		4	975	276.7
	5	1074	236.5		5	1129	260.7

ER	Step	M	SD	ER	Step	M	SD
	1	4.3	2.71		1	4.3	2.71
	2	0.85	1.08		2	0.73	1.22
	3	2.54	2.7		3	4.12	3.04
	4	2.41	2.24		4	2.36	2.07
	5	2.83	3.2		5	3.58	3.56

Note: All times are reported in milliseconds.

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ATCS (Or Explicit Judgments) Data

Cronbach's Alpha-value (.75) of the ATCS items was again reasonably high. As before, participants' responses were averaged to form an attitudinal index. This index ($M = 3.9$, $SD = .84$) differed from the midpoint (3.5) of the scale ($p = .002$). In contrast with the Psychology undergraduates, the Business students expressed a positive attitude toward make-up.

Correlation Between The IAT And ATCS Data

The critical difference score on RT between Step 3 and Step 5 (IAT effect) and the ATCS data (attitudinal index) did not correlate with each other ($r_s = .01$ and $-.13$ --both ns--for the correlation using professions and traits, respectively). No correlations were found either when using the corresponding difference score on ER.

Discussion

This new set of data also leads to the conclusion that, at the implicit level, facial make-up is associated with positive rather than negative attributes (i.e., high rather than low-status professions, positive rather than negative traits). This association is less surprising in the Business students than in the Psychology undergraduates. In our previous research (Huguet et al., in press), the impact of make-up on impression formation was indeed less negative with the former than with the latter. This negative impact, however, was still significant with the Business students. Once more, the associations found here between make-up and positives attributes are therefore rather inconsistent with our impression formation findings. This inconsistency also stems from the business students' positive attitude toward make-up at the explicit level. As before, however, we will return to these findings later in the general discussion.

Study 3 (Aesthetic Students)

Association Between Make-Up And High-Versus Low-Status Professions

The RT and ER data are reported in Table 3. There was a step effect on RT: $F(4, 96) = 16.09, p < .001$ (partial eta-square = .40). The same IAT effect as before was found: $t(28) = -4.42, p < .001$: Participants were faster on the combined task (Step 3), that is, when make-up was associated with high status professions, than on the reversed combined task (Step 5). There were also step effects on ER: $F(4, 96) = 13.68, p < .001$ (partial eta-square = .36). Again, no significant IAT effects were found on errors: $t(40)$ (ns).

Association Between Make-Up And Positive Versus Negative Personality Traits

The RT and ER data are reported in Table 3. There was a step effect on RT: $F(4,96) = 21.46, p < .001$ (partial eta-square = .47). The IAT effect on traits was again clearly significant: $t(28) = -4.89, p < .001$ and compatible with that on professions: Participants were faster on the combined task (Step 3), or when the instruction required to press the same key for responding that a face belonged to the category "wearing make-up" and that a trait was positive, than on the reversed combined task (Step 5). There were also a step effect: $F(4, 96) = 24, p < .001$ (partial eta-square = .50) without any IAT effect on errors: $t(27) = -.35$ (ns).

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Table 3. Reaction Times and Error Rates for Each Step of the Implicit Association Test and for the Association between Make-Up and High- versus Low-Status Professions and the Association between Make-Up and Pleasant versus Unpleasant Words (Study 3, Aesthetic Students)

Make-up and Professions				Make-up and Personality traits			
RT	Step	M	SD	RT	Step	M	SD
	1	1130	276.5		1	1130	276.5
	2	1175	196		2	1234	263.4
	3	1012	214.6		3	1006	244
	4	932	217.4		4	961	234.7
	5	1160	238.4		5	1330	311.8
ER	Step	M	SD	ER	Step	M	SD
	1	3.73	1.49		1	3.73	1.49
	2	1.5	1		2	1.61	1.31
	3	3.07	2.26		3	4.96	2.57
	4	1.82	1.68		4	2.07	1.92
	5	3.14	2.27		5	5.18	3.29

Note: All times are reported in milliseconds.

ATCS (Or Explicit Judgments) Data

The attitudinal index ($\alpha = .68$) of Aesthetic students ($M = 5.2$, $SD = .92$) differed from the midpoint ($p = .001$). This group clearly displayed the most positive (explicit) attitude toward make-up.

Correlation Between The IAT And ATCS Data

The critical difference score on RT between Step 3 and Step 5 (IAT effect) and the ATCS data (attitudinal index) did not correlate with each other ($r_s = .01$ and $-.13$ --both ns--for the correlation using professions and traits, respectively). No correlations were found either when using the corresponding difference score on ER.

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Discussion

The students from the Aesthetic school also expressed a positive attitude toward cosmetics at the implicit level. As did the Business students, they associated make-up to high rather than low-status professions, and to positive rather than negative personality traits. Likewise, their attitude at the explicit level was especially positive, which is not surprising for these students who are trained to use and value cosmetics.

GENERAL DISCUSSION

The goal of the three IAT studies reported here was to determine whether facial make-up is associated with a positive or a negative attitude at the implicit level, and to assess the generalizability of such attitude (if any) across several population samples. Taken together, the results provide evidence that the implicit attitude toward make-up is positive. Regarding the IAT with professions, Psychology, Business, and Aesthetic students, all responded faster on the combined task, where the same key served at identifying the presence of "make-up" and of a "high-status profession," than on the reversed combined task, where this key served at identifying the presence of "make-up" and of a "low-status profession." Likewise, regarding the IAT with personality traits, Business and Aesthetic students responded faster on the combined task, where the same key served at identifying the presence of "make-up" and of a "positive trait," than on the reversed combined task, where this key served at identifying the presence of "make-up" and of a "negative trait." This differential ease with which make-up was associated with high-status professions or positive traits rather than low-status professions or negative traits can be taken as evidence of a positive implicit attitude toward make-up. The fact that the present IAT effects did not correlate with participants' explicit attitude toward make-up also heightens our confidence that they express implicit rather than explicit cognitive associations. In this context, one may wonder why the IAT effects on errors did never occur. Of particular interest here, the participants were systematically instructed to produce the fewest possible errors. They also received feedback on their computer screen for any incorrect responses. Participants, therefore, may have allocated special attention to the accuracy instruction that prevented IAT effects on errors. Consistent with this, the direction of the non significant ER differences between steps 3 and 5 were generally compatible with those (significant) on RT. The few

exceptions were located in Study 1 with the Psychology group when using professions and in Study 2 with the Business group when using personality traits. Given the lack of IAT effect on errors, however, this point does not deserve much attention. What deserves special attention is the fact that the significant associations found on RT in our three IAT studies run counter our previous findings (Huguet et al., in press), which showed a negative impact of make-up on impression formation with exactly the same photographs and similar subject samples. The question that arises is why this negative impact if the implicit attitude toward cosmetics is positive?

Of particular interest here, there were some signs in our previous study that make-up was perceived acceptable in quality but a little bit overly done. And earlier findings (Johnson & Lewis, 1988; Workman & Johnson, 1991) have shown that the use of heavy make-up can trigger negative person perceptions. On this basis, we (Huguet et al. in press) suggested that the negative impact of make-up originated, at least in part, in the quantitative aspect of the cosmetic application. The present IAT findings are very consistent with this earlier suggestion: If make-up is automatically associated with positive attributes, what the participants in our impression formation study rejected was not make-up "per se" but its inappropriate use. In other words, one may reasonably assume that the students selected in this previous study held a positive attitude toward make-up at the implicit level but yet remained extremely sensitive to its quantitative aspect. This conclusion also makes sense for the inconsistencies noted earlier in the present paper about the effects of cosmetics on impression formation. If individuals are indeed extremely sensitive to the quantitative aspect of make-up, it is not surprising that even slight variations in the amount of facial cosmetic produce variations in their explicit judgments about cosmetic users. Taken together, our earlier and present investigation suggests that these variations may result in negative judgments even when the individuals hold a positive attitude about make-up at the implicit level.

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Another interesting conclusion of the present study is that, as suggested in the introduction, group membership can influence attitudes at the implicit level. In our earlier study, the negative influence of make-up on impression formation was stronger in students from Psychology than in students from Business or Aesthetic. The Psychology students' explicit attitude toward make-up (assessed via the ATCS) was also less positive than that of the Aesthetic group. Likewise, in the present study, the Psychology students displayed a positive attitude toward make-up at the implicit level (i.e., association with high-status professions), but the size of the corresponding IAT effect (74 msec) seemed to be yet smaller than the one found with the other participants (128 and 148 msec for students from Business and Aesthetic, respectively). Consistent with this, the Psychology students did not show any IAT effect in Study 1 when using pleasant versus unpleasant words. Because the current studies were run separately, however, this comparison between the three sample of participants is speculative and problematic. Addressing the possible moderating role of group membership on implicit and explicit attitudes will require further research where group membership is systematically manipulated.

CONCLUSION

The present data lead to the general conclusion that facial make-up is automatically associated more with positive than with negative attributes. Yet, our prior research (Huguet et al., in press) shows that facial make-up can elicit negative impressions. Cosmetic use then may not always result in the expected positive effects, all the more so than its influence also depends on the perceivers' group membership. Future research will have to specify how the interaction between such explicit and implicit attitudes affects people's judgment and behavior.

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APPENDIX

High- versus Low-Status versus Professions Used in Studies 1 to 3

Ten undergraduates from the University of Blaise Pascal evaluated the social status of 36 professions with 8 point-Likert type scales anchored by "Not socially valued" (0) at one end and "Socially very valued" (7) at the other. After series of one-sample t-tests, we chose independently twelve high status professions (social value significantly above 3.5) and 12 low status professions (social value significantly below 3.5).

High-status professions					Low-status professions				
English	French	M	SD	t(9)	English	French	M	SD	t(9)
Ambassador	Ambassadeur	6.33	.58	8.5**	Caretaker	Concierge	1.67	1.53	-2.08*
Lawyer	Avocat	6.00	.00		Dustman	Eboueur	2.00	1.00	-2.06*
Dentist	Dentiste	5.67	.58	6.5*	Salesclerk	Vendeur	2.33	.58	-3.5*
Judge	Juge	5.67	.58	6.5*	Streetsweeper	Balayeur	2.33	1.53	-2.26*
Engineer	Ingénieur	5.67	.58	6.5*	Plumber	Plombier	2.67	1.53	-2.3*
President	PDG	5.33	.58	5.5*	Delivery man	Livreur	3.00	1.00	-3.02*
Architect	Architecte	5.33	1.15	2.75	Factory worker	Ouvrier	3.00	1.73	-2.89*
Doctor	Médecin	5.33	1.15	2.75*	Gas station attendant	Pompiste	3.00	1.00	-2.05*
Notary	Notaire	5.33	1.15	2.75*	Hairdresser	Coiffeur	3.00	1.00	-3.02
Surgeon	Chirurgien	5.33	.58	5.5*	Secretary	Secrétaire	3.00	.00	

Journalist	Journaliste	5.00	.00		Truck driver	Routier	3.00	1.00	-
									3.02*
Professor	Professeur	5.00	1.00	2.6*	Waiter	Serveur	3.00	.00	

Note: ** for $p < .01$ and * for $p < .05$.

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Pleasant versus Unpleasant Words Used in the Study 1

Ten undergraduates from the University of Blaise Pascal rated the valence of 57 words on 8 point-Likert type scales anchored by "Very unpleasant" (0) at one end and "Very pleasant" (7) at the other. After series of one-sample t-tests, we chose independently twelve positive words (value significantly above 3.5) and 12 negative words (value significantly below 3.5).

Pleasant words					Unpleasant words				
English	French	M	SD	t(9)	English	French	M	SD	t(9)
Freedom	Liberté	7.00	.00		Agony	Agonie	.00	.00	
Laugh	Rire	6.57	.53	15.87***	Cancer	Cancer	.43	.53	-
									10.93***
Vacation	Vacances	6.57	.53	10.93***	Disaster	Désastre	.43	.79	-
									11.22***
Happiness	Bonheur	6.57	.79	11.22***	Slavery	Esclavage	.57	1.13	-7.67***
Fair	Fête	6.43	.79	8.77***	Bomb	Bombe	.57	.79	-
									10.93***
Sun	Soleil	6.43	.79	10.93***	Jail	Prison	.71	.76	-11***
Pleasure	Plaisir	6.43	1.13	7.67***	Catastroph	Catastrophe	.86	.90	-8.9***
Rest	Repos	6.43	.79	8.9***	Weapon	Arme	1.29	1.11	-4.73**
Dream	Rêve	6.29	.95	8.77***	Pollution	Pollution	1.29	.76	-8.08***
Tenderness	Tendresse	6.29	.76	11***	Dirtiness	Saleté	1.71	1.38	-3.39*
Caress	Caresse	6.00	1.15	6.61***	Pustule	Pustule	1.86	1.07	-4.78***
Health	Santé	6.00	1.00	6.78***	Vomiting	Vomissement	2.00	1.00	-4.58**

Note: *** $p < .001$, ** $p < .01$, * $p < .05$.

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Positive versus Negative Personality Traits Used in Studies 2 and 3

One hundred and twenty undergraduates from the University of Blaise Pascal rated the valence of 47 personality traits on 7 point-Likert type scales anchored by "Very positive" (3) at one end and "Very negative" (-3) at the other. After series of one-sample t-tests, we selected twelve positive traits (value significantly above 0) and 12 negative traits (value significantly below 0).

Positive personality traits					Negative personality traits				
English	French	M	SD	t(119)	English	French	M	SD	t(119)
Friendly	Sympathique	2.70	.59	51.53***	Dishonest	Malhonnête	-2.74	.61	52.74***
Sociable	Sociable	2.65	.81	36.68***	Vain	Vaniteuse	-2.55	.69	40.59***
Intelligent	Intelligente	2.64	.62	42.1***	Shallow	Superficielle	-2.34	.93	38.4***
Honest	Honnête	2.63	.69	43.12***	Submissive	Soumise	-2.34	.99	38.19***
Warm	Chaleureuse	2.54	.63	43.76***	Unsociable	Associable	-2.05	1.54	21.79***
Brilliant	Brillante	2.47	.81	31.91***	Mediocre	Médiocre	-2.27	.93	36.28***
Attractive	Attirante	2.41	.67	39.32***	Repulsive	Repoussante	-2.56	.79	44.48***
Pretty	Jolie	2.32	.67	39.19***	Ugly	Moche	-2.03	1.23	21.86***
Studious	Studieuse	2.30	.93	27.92***	Stupid	Stupide	-2.60	.64	41.52***
Confident	Sûre d'elle-même	2.07	.94	24.55***	Cold	Froide	-1.95	1.20	20.73***
Modest	Modeste	2.01	1.10	20.65***	Unfaithful	Infidèle	-2.33	1.11	38.34***
Sexy	Sexy	1.61	1.14	16.08***	Vulgar	Vulgaire	-2.72	.55	45.61***

Note: *** $p < .001$.

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Correlation Matrices

Correlation matrix of RT at each step of the IAT for the association between make-up and high-versus low-status professions (Study 1, Psychology students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.62**	1			
Step 3	.79**	.69**	1		
Step 4	.39**	.32	.47**	1	
Step 5	.42**	.50**	.47**	.75**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of ER at each step of the IAT for the association between make-up and high-versus low-status professions (Study 1, Psychology students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.05	1			
Step 3	.62**	.12	1		
Step 4	.46*	.30	.58*	1	
Step 5	.28	.17	.87**	.34	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of RT at each step of the IAT for the association between make-up and pleasant versus unpleasant words (Study 1, Psychology students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.66**	1			
Step 3	.62**	.81**	1		
Step 4	.50**	.62**	.81**	1	
Step 5	.30	.67**	.74**	.78**	1

Note: ** $p < .01$, * $p < .05$.

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Correlation matrix of ER at each step of the IAT for the association between make-up and pleasant versus unpleasant words (Study 1, Psychology students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.11	1			
Step 3	-.12	-.17	1		
Step 4	.20	-.32	.66**	1	
Step 5	.19	-.21	.74**	.91**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of RT at each step of the IAT for the association between make-up and high-versus low-status professions (Study 2, Business students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.45**	1			
Step 3	.71**	.73**	1		
Step 4	.53**	.62**	.82**	1	
Step 5	.35*	.61**	.70**	.80**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of ER at each step of the IAT for the association between make-up and high-versus low-status professions (Study 2, Business students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.17	1			
Step 3	.29	.42**	1		
Step 4	.24	.29	.60**	1	
Step 5	.15	.37**	.63**	.76**	1

Note: ** $p < .01$, * $p < .05$.

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Correlation matrix of RT at each step of the IAT for the association between make-up and positive versus negative personality traits (Study 2, Business students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.53**	1			
Step 3	.65**	.78**	1		
Step 4	.68**	.67**	.83**	1	
Step 5	.53**	.58**	.69**	.77**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of ER at each step of the Implicit Association Test and for the association between make-up and positive versus negative personality traits (Study 2, Business students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	-.05	1			
Step 3	.46**	.41**	1		
Step 4	.50**	.12	.71**	1	
Step 5	.22	.23	.65**	.72**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of RT at each step of the IAT for the association between make-up and high-versus low-status professions (Study 3, Aesthetic students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.50**	1			
Step 3	.75**	.76**	1		
Step 4	.71**	.62**	.79**	1	
Step 5	.55**	.46**	.63**	.54**	1

Note: ** $p < .01$, * $p < .05$.

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Correlation matrix of ER at each step of the IAT for the association between make-up and high-versus low-status professions (Study 3, Aesthetic students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.46	1			
Step 3	-.02	.03	1		
Step 4	.15	.14	.54**	1	
Step 5	-.18	-.1	.57**	.53**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of RT at each step of the IAT for the association between make-up and positive versus negative personality traits (Study 3, Aesthetic students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.48**	1			
Step 3	.77**	.70**	1		
Step 4	.81**	.36	.75**	1	
Step 5	.44**	.54**	.57**	.64**	1

Note: ** $p < .01$, * $p < .05$.

Correlation matrix of ER at each step of the IAT for the association between make-up and positive versus negative personality traits (Study 3, Aesthetic students).

	Step 1	Step 2	Step 3	Step 4	Step 5
Step 1	1				
Step 2	.25	1			
Step 3	.46**	.51**	1		
Step 4	.19	.45*	.30	1	
Step 5	-.05	.19	.42*	.48*	1

Note: ** $p < .01$, * $p < .05$.

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