RESEARCH ARTICLE

Evidence that Social Comparison with the Thin Ideal Affects Implicit Self-Evaluation

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Research on body image suggests that social comparison with the thin ideal has a number of negative consequences for women. To date, however, little is known on how social comparison with the thin ideal affects the accessibility of positive thoughts and feelings about the self (implicit self-liking). To examine this issue, one hundred and twenty-six young women from two countries, Canada and France, were exposed either to fourteen photographs of the thin ideal or to the same images airbrushed to make the models look slightly larger. They next completed a lexical decision task with positive self-related transitive verbs as stimuli (e.g., 'To like myself'). As expected, women exposed to the thin-ideal models took longer to correctly identify self-liking verbs compared to women who were exposed to slightly larger models. No effects were found on other positive verbs, and there were no effects of the country. The results suggest that social comparison with the thin ideal reduces implicit self-liking among young women.

Several meta-analyses reveal that thin-ideal exposure has a host of negative consequences for women's psychological and physical well-being (Ferguson, 2013; Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002; Want, 2009). This includes body image anxiety (e.g. Brown & Dittmar, 2005; Chatard, Bocage-Barthélémy, Selimbegović, & Guimond, 2017; Dittmar & Howard, 2004; Halliwell & Dittmar, 2004; Thornton & Maurice, 1997), low self-esteem and depressive symptoms (Bessenoff, 2006; Balcetis, Cole, Chelberg, & Alicke, 2013; Heinberg & Thompson, 1995; Stice & Bearman, 2001), and eating disorders (e.g., Harrison, 2001; Harrison & Cantor, 1997; Stice, Schupak-Neuberg, Shaw, & Stein, 1994). Meta-analyses also reveal that women who have pre-existing body image concerns (body-dissatisfied women) are particularly vulnerable to thin-ideal exposure (Grabe et al., 2008). Although these effects are well documented, one limitation of the extant literature is that most research has relied on self-report measures. This may be problematic because such measures are sensitive to social desirability and demand characteristics (Groesz et al., 2002; Jansen & de Vries, 2002; Mills, Polivy, Herman, & Tiggemann, 2002). As a result, participants may guess the hypothesis of the researcher and confirm the expectations simply because they can control their responses. One way to avoid this problem is to use measures that rely on less controllable responses and for which it is not obvious what is actually being measured (i.e., implicit or indirect measures), such as behavioral measures based on reaction times (Gawronski & De Houwer, 2014). To date, however, few studies have sought to examine whether thin-ideal exposure affects women's implicit self-evaluation. In what follows, we briefly review evidence of negative effects of thin-ideal exposure on self-reported (thus explicit) measures, and the scarce previous work relying on implicit measures. Next, we report an experiment that aimed at testing the link between thin-ideal exposure and implicit self-liking.

Effects of thin-ideal exposure on explicit measures

Previous research indicates that viewing pictures of underweight models affects self-reported self-evaluation such as explicit self-esteem (Bessenoff, 2006; Hawkins, Richards, Granley, & Stein, 2004; Wilcox & Laird, 2000) or body dissatisfaction (Myers & Crowther, 2009). However, these effects appear to be moderated by demand characteristics. In an influential paper, Mills et al. (2002) showed that restrained eaters reported feelings worse following exposure to thin-ideal images, but only when demand characteristics were explicit (i.e., when participants were informed of the hypothesis before responding to the questionnaire). As the authors noticed, these results *"underscore the importance of reducing demand characteristics to ensure internally valid results."* (p. 1696). This study clearly highlighted one of the major limitations of self-reported measures.

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Each measure has strengths and weaknesses. The advantages of self-report measures are obvious. They are easy to administer, and they usually have good psychometric properties. However, the limitations of self-report measures are also well known. First of all, individuals can only accurately report on their thoughts, feelings, and desires which they are aware of (Nisbett & Wilson, 1977). Second, self-report responses are controllable and respondents will only report what they want to report, while they can also intentionally fake their responses (Dompnier, Darnon, & Butera, 2009). Although not systematically, discrepancies between self-report and reaction time-based measures of the same construct are often documented (Nosek, 2007).

In sum, even if effects of thin-ideal exposure on explicit measures are well documented in the literature, as attested by several meta-analyses, the interpretation of these effects is not entirely clear. This is mainly because body image researchers have failed to address the problem of demand characteristics. In an effort to address this limitation, some authors have relied on indirect measures of self-evaluation.

Effects of thin-ideal exposure on implicit measures

Research relying on indirect measure to study the effects of thin-ideal exposure has only begun to develop. Johansson, Lundh, and Andersson (2005) were the first to use indirect measures to assess effects of thin-ideal exposure. They hypothesized that negative information would be more accessible in body-dissatisfied than in body-satisfied women after viewing thin-ideal media images. They used an emotional Stroop task in order to assess the accessibility of failure-related words (such as "defeat" or "worthless"), assuming that high accessibility would produce greater Stroop interference. Their findings show that after thin-ideal exposure dissatisfied women displayed higher Stroop interference for failure-related words than body-satisfied women. These results are consistent with the idea that exposure to the thin ideal increases the accessibility of failure-related concerns for body-dissatisfied women (but not for those who are satisfied).

Subsequent studies have corroborated these findings. In particular, it has been shown that thin-ideal exposure attenuates the tendency to associate the self, the ingroup, and one's gender with beauty-related constructs in an implicit association test (Gurari, Hetts, & Strube, 2006). In another experiment, exposure to the thin ideal has been found to increase the accessibility of concepts semantically related to failure, such as suicide, in a lexical decision task (Chatard & Selimbegović, 2011, Study 6). In this experiment, body-dissatisfied women were faster at correctly identifying suicide- and escape-related words in a lexical decision task following brief exposure to the thin ideal.

In sum, the few studies using implicit measures yielded results that are congruent with and confirm the noxious effect of thin-ideal media images observed on self-reported measures. These studies are important because they suggest that effects on self-reported measures are not driven only by self-presentational concerns (Groesz et al., 2002). However, indirect measures that have been used to date have their downsides too. In particular, they do not allow drawing strong conclusions about the impact of the comparison for the self. They mainly show that the accessibility of very broad concepts (e.g., "failure", "suicide") is heightened following social comparison with the thin ideal (Johansson et al., 2005; Chatard & Selimbegović, 2011). Similarly, the measures reported by Gurari et al. (2006) on automatic associations with beauty constructs were not specific to the self, but encompassed the self, the ingroup (e.g. "us"), and one's gender. Thus, these studies provide little direct evidence that thin-ideal exposure has a direct effect on the self, and more particularly, on implicit self-evaluation.

The Present Study

The aim of the present work was to test the hypothesis that thin-ideal exposure affects implicit self-evaluation. To reach this goal, we used a lexical decision task with transitive verbs (e.g. 'To like myself'), rather than words (e.g. 'like'), as stimuli. In that way, we could test the hypothesis that thin-ideal exposure specifically affects the self (implicit self-evaluation), rather than merely the accessibility of broad concepts, as in previous studies (Johansson et al., 2005; Chatard & Selimbegović, 2011). We reasoned that if the social comparison with the thin ideal lowers women's implicit self-evaluation, as suggested by prior studies, then women would take longer to correctly identify self-liking verbs in the lexical decision task after exposure to thin-ideal models than after exposure to larger, more realistic models. Furthermore, as suggested by previous research and meta-analyses (Ferguson, 2013; Grabe et al., 2008; Johansson et al., 2005), body dissatisfaction could facilitate the occurrence of negative consequences of thin-ideal exposure. Thus, we expected the effect of thin-ideal exposure on recognition latencies to self-liking verbs to increase with body dissatisfaction.

To provide a stringent test of our hypotheses, we used a control condition that differs from the experimental (thin ideal) condition exclusively in terms of thinness of the featured models. In the thin-ideal condition, participants were exposed to 14 thin-ideal media images (see **Figure 1** for an illustration). In the control condition, participants were exposed to the same images, airbrushed to look slightly larger (normal weight). In that way, we could ensure that the effects are driven only by the difference in thinness between the two conditions. To verify that this manipulation was successful we also assessed a motivational consequence of thin-ideal exposure: desire for thinness. Previous studies indicate that thin-ideal exposure increases women's desire for thinness (Dittmar, Halliwell, & Ive, 2006; Dittmar, Halliwell, & Stirling, 2009). Thus, we expected women in the thin-ideal condition, compared to the control condition, to report greater desire for a thinner body shape.

Figure 1: Example of thin-ideal (left) and larger (right) media images used in this experiment. Taken with permission from Chatard et al. (2017) (https://osf.io/ngne6/).

Method

Participants

Participants for this study came from two French-speaking countries: France and Canada (Québec). The two samples were collected at the same time period in the two countries. After ensuring that country did not interact with condition, the two samples were aggregated to increase statistical power for hypothesis testing (see below).

The first sample included 91 female participants (M_{age} = 24.60 years, SD = 8.09) from the University of Trois-Rivières (Québec, Canada). Two female research assistants recruited them in the University library or on the campus. According to the body mass index (M = 23.13, SD = 3.89), 77.8% of participants had normal weight (18.5 ≤ BMI ≤ 25), 1.1% were underweight (BMI < 18.5), 12.2% were overweight (25 < BMI ≤ 30), and 8.9% were obese (BMI > 30).

The second sample included thirty-five female participants (M_{age} = 23.30 years, SD = 7.05) from the University of Poitiers, France. A male research assistant recruited them on the University campus. According to the body mass index (M = 21.20, SD = 3.11), 62.9% of participants had normal weight (18.5 ≤ BMI ≤ 25), 22.9% were underweight (BMI < 18.5), 14.3% were overweight (25 < BMI ≤ 30), and none were obese (BMI > 30).

Materials and procedure

The experiment was implemented on a computer using Psychopy® software (Peirce, 2007, 2008). Participants first reported their age, native language, height and weight. Other material used in the study is described below in the order in which the different tasks were administered.

Body dissatisfaction. In the two samples, women were first asked to complete the Body Dissatisfaction subscale of the Eating Disorder Inventory (EDI-BD, Garner, Olmstead, & Polivy, 1983).[1] They indicated their agreement with nine propositions (e.g., "I think that my stomach is just the right size") using 7-point Likert-type scales (1 = *completely disagree*, 7 = *completely agree*). Mean body dissatisfaction score was close to the midpoint of the scale (M = 4.08, SD = 1.18). This measure was included to control for its possible effects because prior research suggests that effects of thin-ideal exposure are more pronounced on body-dissatisfied than on body-satisfied women (Grabe et al. 2008).

Experimental manipulation and ratings of physical attractiveness of the models. Participants were randomly exposed either to 14 photographs of models who embodied the thin ideal (n = 66), or to 14 photographs featuring these same models, but airbrushed to look slightly larger and thus more realistic in terms of body size (n = 60) (see **Figure 1** for an illustration). Therefore, pictures used in the two conditions only differed in thinness. During the exposition, participants were asked to evaluate the physical attractiveness of the models. Thus, each picture was displayed once, until the participant indicated the extent to which she thought the model was pretty (1 = not at all to 7 = very pretty). This additional measure was implemented for three reasons. First, by asking participants to evaluate the models, we ensured that they were attentive to the photographs, and that they processed them in terms of physical attractiveness. Second, it allowed us to subsequently check if thin-ideal exposure indeed reinforces the association between beauty

and thinness, by inducing women to evaluate thinner models as prettier. Third, it allowed us to maintain the cover story of the study by providing a reason to expose participants to the pictures. The stimuli were taken from Chatard et al. (2017) and are publicly available at https://osf.io/ngne6/.

Lexical decision. After thin-ideal exposure, participants completed a lexical decision task. Letter strings were successively presented on the computer screen in a fully random order. Participants had to indicate as fast as possible if each letter string formed a regular word by pressing a key on the keyboard or a non-word by pressing a different key. All regular words were transitive verbs, and the non-words were strings of letters formed with the same letters but in a different order. Half of the stimuli were transitive verbs (in French) and half were non-words. Among the verbs, five were neutral (*s'étirer* [to stretch], *se peigner* [to comb one's hair], *se promener* [to walk around], *se souvenir* [to remember], and *s'habiller* [to dress]), three were related to self-liking: *s'apprécier* [to appreciate oneself], *s'aimer* [to love oneself], and *se plaire* [to like oneself]; and two were positive verbs but unrelated to self-liking (used as controls): *se régaler* [to enjoy oneself] and *se réjouir* [to be delighted]).

Desire for thinness. The body size guide (Harris, Bradlyn, Coffman, Gunel, & Cottrell, 2008) was used to measure perceptions of actual and ideal body shape. Participants were exposed to 10 photographs of the same woman, presented simultaneously in a continuous row. From left to right each photograph was a larger, more corpulent version than the previous one. Participants first indicated the picture that they thought best represented their current body shape (actual body image), and then the one that corresponded to their desired body shape (ideal body image). Higher scores on these two measures indicated thinner actual and ideal self-perceptions (scores could range from 1 to 10). The desired body shape (i.e. ideal body image) was used as an indicator of the desire for thinness. This measure allowed us to check if the thin ideal is indeed perceived as a standard to reach, that is, if exposure to the thin ideal increases the desire to be thin. The actual body image measure was not used in the analyses reported below and will not be discussed further.

Results

The materials, data and code for this study are available at: https://osf.io/yktbz/.

Data preparation. Incorrect responses on the lexical decision task were excluded from the analysis (2.46%). Following recommendations for reaction time (RT) data (Bargh & Chartrand, 2000), responses greater than 2000 ms were replaced by 2000 ms. Then, we computed the mean RT for the 5 neutral verbs, the 2 positive verbs unrelated to self-liking, and the 3 positive verbs related to self-liking. As a method for outlier detection, we used the absolute deviation around the median (Median Absolute Deviation, MAD, Leys, Ley, Klein, Bernard, & Licata, 2013). We report in text the means after exclusion of the outliers detected using the MAD3 method. For transparency, we also report

the results obtained when outliers are defined via the standardized z-scores method for the main analyses. For all analyses, we report partial eta-squared as a measure of effect size. As there is a continuous body satisfaction variable in the model, we report condition means predicted by the regression model at mean level of RT for neutral words in our main analysis.

Preliminary analyses

Physical attractiveness of the models. Evaluation of the physical attractiveness of the models was examined to see whether the thinness is associated with higher attractiveness ratings, and whether this effect is moderated by body dissatisfaction. No outliers were detected on this variable. We submitted mean physical attractiveness rating to a regression analysis with condition, body dissatisfaction (mean-centered), and the condition by body dissatisfaction interaction as predictors. Effects of condition and body dissatisfaction were not significant, $t(122) = 0.758$, $p = 0.45$, $\eta^2_p = 0.005$, and $t(122) = -0.303$, $p = 0.763$, $\eta^2_p < 0.001$, respectively. However, there was a significant interaction between condition and body dissatisfaction, $t(122) = 3.031$, $p = 0.003$, $\eta^2_p = 0.07$. This interaction reflects the fact that body-dissatisfied (+1SD) women evaluated the thin models as significantly more attractive ($M = 6.447$) than the larger models ($M = 5.646$), $t(122) = 2.675$, $p = 0.008$, $\eta^2_p = 0.055$, while the body-satisfied (−1SD) women evaluated the larger models ($M = 6.354$) as more attractive than the thin models ($M = 5.867$), although not significantly, $t(122) = -1.657$, $p = 0.10$, $\eta^2_p = 0.022$. Thus, body dissatisfied women were particularly likely to increasingly associate thinness with beauty after thin-ideal exposure.

Desire for thinness. Three outliers were detected and removed from the analysis and one participant did not indicate her response. Desire for thinness was then submitted to a regression analysis with condition, body dissatisfaction (mean-centered), and the condition by body dissatisfaction interaction as predictors. The effect of condition was significant, $t(118) = 4.077$, $p < 0.001$, $\eta^2_p = 0.123$, showing that participants wished to be thinner in the thin-ideal ($M = 9.141$) than in the larger model condition ($M = 8.359$). Effects of body dissatisfaction and of the condition by body dissatisfaction interaction were not significant, $t(118) = -1.935$, $p = 0.055$, $\eta^2_p = 0.031$, and $t(118) = 1.845$, $p = 0.068$, $\eta^2_p = 0.028$, respectively. Thus, irrespective of body dissatisfaction, exposure to the thin ideal increased the perceived value of thinness as a standard to be reached, as indicated by the desire for thinness.

Country. Considering that our sample is composed of participants from two countries, we examined whether the country moderated condition effects on our main dependent variables (self-liking and positive verbs). We conducted 2 (condition: thin-ideal vs. larger models) × 2(country: France vs. Canada) ANCOVAs with RT for neutral words as a covariate, on self-liking verbs and positive verbs. Results yielded non-significant interactions between country and condition for both self-liking verbs, $F(1, 113) = 0.719$, $p = 0.398$, $\eta^2_p = 0.006$ and for positive verbs, $F(1, 112) = 2.815$,

$p = 0.096$, $\eta^2_p = 0.025$. Country effects will thus not be discussed further.

Main analyses

Lexical decision. We controlled for individual differences in RT on the lexical decision task by including RT for neutral verbs as a covariate in the analyses of variance. Thus, effects reported below are independent from RT for neutral verbs. To examine whether pre-existing differences in body dissatisfaction moderated the effects of condition on self-liking and positive verbs, we included this variable and the product term between body dissatisfaction and condition in the model (body dissatisfaction and RT for neutral words were previously mean-centered).

    Self-liking verbs. Six outliers were detected on RT for self-likings verbs and five on RT for neutral verbs, 3 of them being the same individuals on both measures. Hence, a total of 8 outliers were removed from the analysis. We conducted a regression analysis with condition (thin-ideal models vs. larger models), body dissatisfaction (continuous, mean-centered), the condition by body dissatisfaction interaction, and RT for neutral words (continuous, mean-centered) as predictors, and RT for self-liking verbs as the dependent measure. The effect of condition was significant, $t(113) = 2.621$, $p = 0.01$, $\eta^{2\ 2}_p = 0.057$. As expected, adjusted RTs for self-liking verbs were longer in the thin-ideal ($M = 0.722$) than in the larger model condition ($M = 0.666$).[2] The effect of body dissatisfaction was not significant, $t(113) = 0.713$, $p = 0.477$, $\eta^{2\ 2}_p = 0.004$. The effect of condition was not moderated by body dissatisfaction, $t(113) = 1.46$, $p = 0.147$, $\eta^2_p = 0.018$, and different methods of outlier detection did not change the significance of the results (**Table 1**).

    Positive verbs. Seven outliers were detected on RT for positive verbs and 5 on RT for neutral verbs, 3 of them being the same individuals on both measures. Thus, a total of 9 outliers were removed from the analysis. We conducted a regression analysis with condition (thin-ideal models vs. larger models), body dissatisfaction (continuous, mean-centered), the condition by body dissatisfaction interaction, and RT for neutral words (continuous, mean-centered) as predictors, and RT for self-liking verbs as the dependent measure. We found no significant effect of condition on RT for positive verbs, $t(112) = -0.001$, $p = 0.99$, $\eta^2_p < 0.001$. RT for positive verbs were not longer in the thin-ideal than in the larger model condition ($M = 0.755$ in both conditions). The effect of body dissatisfaction was not significant,

$t(112) = 1.11$, $p = 0.269$, $\eta^2_p = 0.011$, nor was the interaction between the condition and body dissatisfaction, $t(112) = 1.561$, $p = 0.121$, $\eta^2_p = 0.021$. In sum, accessibility of positive verbs was not affected by thin-ideal exposure or related to body dissatisfaction.

Discussion

The present findings indicate that young women took longer to identify transitive verbs related to self-liking following exposure to the thin ideal than when exposed to slightly larger models. This is consistent with the idea that social comparison with such an extremely high standard of comparison affects implicit self-evaluations, as assessed by the cognitive accessibility of transitive verbs related to self-liking. In contrast with some of the previous research (see Ferguson, 2013; Grabe et al., 2008 for a meta-analysis), body dissatisfaction did not moderate the effect of thin-ideal exposure. The most probable explanation for this, in our view, is the lack of statistical power. Indeed, as argued by MacKinnon, Lockwood, Hoffman, West, and Sheets (2002), testing a moderation effect requires high sample size, and all the more so if the effect is small. We examined achieved power to detect this interaction with Klein's (2017) online application for computing statistical power for an interaction involving a categorical and a continuous predictor, and it yielded a result of $1 - \beta = 0.25$. Thus, the absence of moderation by body dissatisfaction is not very surprising.

    The main theoretical contribution of these findings is to show, in an unambiguous manner, that negative changes in thoughts accessibility after thin-ideal exposure are self-related. Previous research, focusing on negative thoughts accessibility has shown an increase of this kind of thoughts after thin-ideal exposure (Chatard & Selimbegović, 2011; Johansson et al., 2005), arguing that it was self-related due to feelings of personal failure. Nevertheless, it remains possible that thin-ideal exposure simply increases negative thoughts accessibility without these negative thoughts necessarily being self-related. The present results confirm the interpretation in terms of self-related negative thoughts. In addition, as the main dependent measure in this study was implicit self-liking, they complement the extant literature by relying on an indicator of positive rather than negative cognitions.

    Another theoretical contribution of the present research is the indirect nature of the self-liking measure. As we emphasized in the introduction, to date most research on

Table 1: Adjusted means of RT for self-liking verbs (in seconds) in the two conditions for different methods of outlier detection.

	Means		ddl	t	p	η^2
	Thin	**Larger**				
MAD 2.5	0.707	0.655	106	2.639	0.010	0.047
MAD 3	0.722	0.666	113	2.621	0.01	0.057
Z score +/− 2.5SD	0.735	0.674	117	2.662	0.009	0.059
Z score +/− 3SD	0.738	0.677	117	2.662	0.009	0.059

the effects of thin-ideal exposure relied on explicit, self-report measures. In contrast, here we used an implicit measure of cognitive accessibility, based on reaction time data. Consistent with what was observed on self-report measures, it was shown that thin-ideal exposure induces negative changes in the content of accessible thoughts, even though women do not have pre-existent concerns related to their physical appearance. Those findings also suggest that thin-ideal exposure has deleterious effects on both the explicit (ideal body image) and the implicit level (implicit self-liking). One implication is that strategies to attenuate or suppress these effects have to focus, among others, on implicit cognitions. As implicit self-liking is likely to be grounded in automatic processes, these results are consistent with the idea that self-evaluation is automatically affected upon thin-ideal exposure. Obviously, the present study itself does not allow us to strongly claim that the process under study is automatic but it adds to a growing body of research consistent with this hypothesis (Bocage-Barthélémy et al., *submitted manuscript*; Chatard et al., 2017).

In addition, the present study brings a methodological contribution to the literature. Indeed, our control condition differed from the experimental (thin ideal) condition exclusively in terms of models' thinness. As noticed by Ferguson (2013), many studies contrast thin-ideal models with nonhuman objects (e.g. Hawkins et al., 2004; Mills et al., 2002). However, the use of photographs of nonhuman objects as controls arguably fails to isolate the thin-ideal exposure variable, because many features other than thinness differ between the experimental and the control condition. For instance, nonhuman objects prevent social comparison. Thus, any effects of the experimental manipulation may be due to engaging versus not engaging in social comparison, rather than to thinness of the models in the experimental condition. Even if the control condition features photographs of more corpulent women, often these are not the same women as those that embody the thin ideal in the experimental condition. Thus, their facial traits, clothing, hair, and other attributes systematically differ between conditions and introduce confounded variables. In contrast, in the present study, we can reliably conclude that the drop in implicit self-liking and the increase in the desire to be thin are caused by exposure and comparison to thin rather than more realistic models, because everything except thinness of the models (including their physical attractiveness) was held constant across conditions.

Finally, it is noteworthy that we found similar findings in the two countries examined here: France and Canada. This suggests that our findings are not specific to a particular country, and that they can be replicated in at least two different western countries. Indeed, similar findings might be found in most western countries, as most (if not all) western societies tend to impose slender criteria for women's beauty.

Limitations and future research

One limitation of the present work is the novelty of the self-liking measure. Although it is indirect, positive, and clearly self-related, it has never been used before to measure implicit self-liking. Therefore, in future research it would be useful to use this measure simultaneously with other implicit self-evaluation measures to provide further validation of this new measure. In the meantime, the present results, largely consistent with the literature, suggest that this measure is valid.

Another limitation is related to our sample. Indeed, as is often the case, participants were young women enrolled in a university curriculum, who are unlikely to be representative of the general population of women. Thus the generalizability of the present findings is limited. In addition, previous research suggests that somewhat older women may have developed compensatory mechanisms which protect them from further increasing body dissatisfaction when exposed to the thin ideal, even if with age physical appearance is further away from idealized beauty (e.g. Webster & Tiggemann, 2003). However, it remains unknown whether older women are also protected on an implicit level, and this is an interesting topic to be studied in future research. Indeed, if explicit but not implicit self-image is protected in older women, thin-ideal exposure may foster discrepancy between these two constructs. Such a discrepancy may, in turn, produce other effects documented in the extant literature such as, for instance, depressive symptomatology (Franck, De Raedt, & De Houwer, 2007), increased processing of discrepancy-related information (Briñol, Petty, & Wheeler, 2006), or certain mental health problems (Schröder-Abé, Rudolph, & Schütz, 2007; Zeigler-Hill, 2006).

Lastly, interrogations could be made concerning processes that underlie the effects observed in the present study. We argued that participants' responses during the lexical decision task after thin-ideal exposure are the results of a change in participants' self-evaluations. Although we demonstrated solid evidence in favor of this hypothesis, more research is needed to clearly exclude alternative explanations. Indeed, in the present study, we do not know in what extent participants' responses are influenced by changes in the perception of the target, or by a decrease of participants' certainty regarding their self-evaluations. To discriminate these different processes, the use of the Drift Diffusion Model (DDM) could be relevant (Johnson, Hopwood, Cesario, & Pleskac, 2017; Ratcliff, 1978). The DDM is a model of the cognitive processes involved in simple relatively fast two-choice decisions (as in lexical decision task) (Ratcliff & McKoon, 2008). As argued by Ratcliff and McKoon (2008), "*it separates the quality of evidence entering the decision from decision criteria and from other processes*" (p. 875). Thus, by having the advantage to separate the driver of the results to the accumulation of evidence, this model could be helpful to determinate more precisely the process underlying participants' responses after thin-ideal exposure.

Summary and conclusions

Despite some limitations, the present experiment usefully extends the extant literature, and opens interesting avenues for future research. Results are consistent with previous research and complement them by showing a deleterious effect of thin-ideal exposure on implicit self-

liking, adding to already documented effects on implicit measures of negative thoughts (Chatard & Selimbegović, 2011; Johansson et al., 2005). These findings suggest that thin-ideal exposure may affect mental and physical well-being of women via two routes simultaneously: explicit and implicit.

Notes
[1] In the two samples, the body dissatisfaction scale was embedded into a series of individual differences measures that were used for explorative purpose. These filler measures were different in the two samples. Thus, there were not analyzed for this study.

[2] Having parallel effects on implicit self-liking and ideal body image suggests that the modification in the ideal body image might mediate the effects on implicit self-liking, or vice versa. However, these two variables were not related, $r(119) = 0.028$, $p = 0.762$, even when reaction times for neutral verbs are controlled for, $r(114) = 0.099$, $p = 0.292$. Therefore, we did not pursue mediation analyses.

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Competing Interests
The authors have no competing interests to declare.

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