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EVOLUTIONARY PSYCHOLOGY | RESEARCH ARTICLE

Does make-up make you feel smarter? The “lipstick effect” extended to academic achievement

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Abstract: Previous studies have shown that higher levels of self-esteem are associated with better academic performance. However, there is no evidence if make-up can indirectly influence academic achievement and cognition through self-esteem. In this study, we examined the possibility that make-up can affect academic performance by asking 186 female undergraduate students to take a simulated university examination. Participants were randomly assigned to three groups, which consisted of wearing make-up, listening to positive music, and face coloring. Results showed that female students who had put make-up on received higher grades compared to those who did not. In addition, these students outperformed students with positive mood only and students who were engaged in a control activity. These findings underline the necessity of adopting a multidimensional approach to learning and memory and attest to the importance of studying further the interaction between physical self-esteem and cosmetics in cognition.

Subjects: Psychological Science; Evolutionary Psychology; Cognitive Psychology

Keywords: cosmetics; physical self-esteem and learning



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Rocco Palumbo is a PhD in Cognitive Neuroscience. He has a background focused in monitoring changes of cognitive functions in pathologic and healthy populations. He has worked on a wide range of projects, including the study of normal functioning in different domains, such as perception, attention, emotion, and memory, he investigated how these functions change during the life span and how pathological conditions, such as dementia or mental disorders, affect cognitive functions. During his visit to Brandeis University in 2013, he focused his research in investigating how social cognition, specifically face perception, changes during the life span and how emotions can affect daily tasks in younger and older adults. In 2014, he started his postdoctoral fellowship in vision science at Schepens Eye Research Institute, Harvard Medical School. Dr Palumbo is currently interested in investigating the neurobiological underpinnings of high-order cognitive functioning, with a link to cognitive enhancement interventions.

PUBLIC INTEREST STATEMENT

What is the relationship between self-esteem and daily life tasks? Do we perform better when we feel more secure of our physical appearance? Previous studies have shown that higher levels of self-esteem are associated with better academic performance. However, there is no evidence if make-up can indirectly influence academic achievement and cognition through self-esteem. In this study, we aimed to explore whether or not wearing make-up can increase the level of perceived beauty, with consequent enhancement of self-esteem, resulting in better cognitive performance.

1. Introduction

Cosmetics nowadays are intensively used in many societies and people are generally willing to spend large amounts of their available income to purchase them, even in difficult times (Cash & Cash, 1982). Moreover, repeated media messages suggest that physical attraction is valued positively, especially in terms of first impression (e.g. Zebrowitz & Franklin, 2014; Zebrowitz, Franklin, & Palumbo, 2015). Consequently, the social function of cosmetics has been widely studied with an evolutionary and anthropological approach (e.g. Cash, Dawson, Davis, Bowen, & Galumbeck, 1989; McKeachie, 1952; Rhodes, 2006; Russell, 2003, 2009) and make-up has always been regarded as a sense stimulator which benefits touch, smell, and sight (becoming good looking and beautiful). In turn, the positive stimulation of these senses by using make-up induces sensory and psychological pleasure (Korichi, Pelle-de-Queral, Gazano, & Aubert, 2008). Furthermore, a recent study by Hill, Rodeheffer, Griskevicius, Durante, and White (2012) found that women even use cosmetics as a form of compensation strategy during times of economic recession. For instance, the authors examined how during the past 20 years, when diverse periods of recession have occurred, women have spent more money on beauty products. In addition, the fact that the recession has made young, unmarried women increase their desire to buy beauty products (especially luxury beauty products) and their concern and wish to look more attractive, has brought forward a notion coined by journalists as the “lipstick effect” (Nelson, 2001).

One explanation for this effect lays in the fact that make-up may function as a physical self-esteem booster (Cash, Rissi, & Chapman, 1985; Forbes, Doroszewicz, Card, & Adams-Curtis, 2004). Self-esteem can be defined in terms of cognitive generalizations deriving from prior experience and it can be considered one of the most important personality characteristics for an individual. Individuals are not isolated from their surrounding environment and therefore his/her past experience impacts his/her self-esteem. Importantly, it is well known that a person’s physical attractiveness is a major factor in his/her experience and it is logical and empirically documented to be a substantial influence on self-esteem. Improving a physical trait improves attitude, personality, and self-esteem (Patzner, 1997).

Furthermore, previous studies have shown that physical self-esteem is relevant for cognitive performance as patients with body dysmorphic disorder or more general body dissatisfied women show a specific pattern of attentional biases and beliefs (e.g. Buhlmann, Teachman, Naumann, Fehlinger, & Rief, 2009; Gao et al., 2011) which may affect cognitive processing. Most importantly, evidence demonstrating the relation between academic performance and higher levels of self-esteem have been found (Alves-Martins, Peixoto, Gouveia-Pereira, Amaral, & Pedro, 2002; Richardson, Abraham, & Bond, 2012).

Accordingly, cosmetics may be explicitly and implicitly used in ways that affect different aspects of a woman’s life. For example, cosmetics manipulate facial appearance and therefore affect beauty and can be considered as a sort of attractiveness enhancer. Women, thus, may use make-up to increase their levels of self-esteem by boosting their physical attractiveness and this consequently makes them feel better during stressful times (Hill et al., 2012). A complementary hypothesis suggests that make-up may also influence cognitive performance via positive emotions. That is, make-up may function as a positive mood induction technique that, in turn, leads to better performance. In fact, the link between positive emotions and academic achievement has been widely studied (e.g. Mega, Ronconi, & De Beni, 2014) and numerous findings underline how positive emotions particularly enhance cognitive functions (e.g. verbal working memory and fluency) that play a crucial role in learning and complex cognitive abilities (e.g. Altamura et al., 2016; Di Domenico, Palumbo, Fairfield, & Mammarella, 2016; Di Domenico, Palumbo, Mammarella, & Fairfield, 2015; Fairfield, Mammarella, Di Domenico, & Palumbo, 2015; Fairfield, Mammarella, Palumbo, & Di Domenico, 2015; Mammarella, Di Domenico, Palumbo, & Fairfield, 2016a; Storbeck & Watson, 2014; for a review see Fredrickson, 2001; Mammarella, Di Domenico, Palumbo, & Fairfield, 2016b). Generally speaking, positive emotions increase the amount of information accessible in memory and therefore can ultimately help students make sense of what they are learning (e.g. Hicks, Cicero, Trent, Burton, & King, 2010).

More recently, a number of studies that have investigated the use of environmental auditory techniques for enhancing cognitive performance through emotions, have documented the value of using classical music (e.g. Schellenberg & Hallam, 2005; Schellenberg & Weiss, 2013; Swaminathan & Schellenberg, 2015). For example, many studies about older adults, as well as patients with dementia of Alzheimer's type (e.g. Sherratt, Thornton, & Hatton, 2004), have confirmed potential benefits of music, showing an increase in performance on various dependent measures (e.g. observed levels of social interaction and well-being, autobiographical memory, category fluency, etc.). The authors explained music benefits in terms of an arousal-and-mood hypothesis claiming that better performance is a consequence of arousal and mood level induced by listening to music. Specifically, listening to classical music improves how participants feel as well as their level of arousal and, as a result, aids their performance on a given cognitive task.

It is thus possible that increased physical self-esteem together with more positive emotions may lead to better cognitive performance. Whenever this benefit is found, one may ultimately argue that it can be based on general cognitive and motor preactivation. That is, several authors (e.g. Otten, Quayle, Akram, Ditewiq, & Rugg, 2006) have suggested that enhancement of subsequent cognitive performance (especially memory) may simply be attributed to a general increase in activation due to the preceding task rather than to a specific contextual manipulation. When putting on make-up, females may voluntarily allocate their attention to fine motor hand movements and focus on face details (eyes, mouth, etc.) and consequently be more perceptually/attentionally aroused and prompt to act.

To highlight the contribution of make-up on cognitive performance, the present study employed an extension of the lipstick effect. We examined whether wearing make-up, listening to a positive music excerpt or coloring a face facilitate cognitive performance such as learning of new material. All these tasks involved a motor component but differed in terms of emotional and physical self-esteem connotation. The make-up condition, in fact, should promote a higher level of perceived beauty and consequent physical self-esteem coupled with positive emotions. The positive music condition should promote a higher level of positive emotions only. Finally, the coloring condition should represent a control preactivation task (Otten et al., 2006). Given the different ways each condition should enhance cognitive performance, we predicted that female students who wore make-up would perform better compared to the other two groups. However, we also predicted that better performance would be seen in the positive music group compared to the face-coloring condition.

2. Method

2.1. Participants

Three-hundred female first-year University students were recruited for the preliminary phase of the study. Of these, 186 took part in the experimental phase (see Table 1 for demographic characteristics). All of the participants provided written informed consent and reported normal hearing and normal or corrected to normal vision. Data collection was stopped when two conditions were met: (a) each of the experimental conditions had 62 participants, (b) the demographic and cognitive characteristics of participants in each condition was similar. The protocol was approved by the Department's Ethical Committee and it was carried out in accordance with the provisions of the World Medical Association Declaration of Helsinki.

2.2. Materials and procedure

Before beginning the preliminary selection phase, we asked all participants to confirm their grade on the general psychology examination (maximum score 30). Only participants with a grade between 25 and 28 participated in the preliminary selection phase. In the preliminary selection phase (day 1), students were asked to rate their level of physical self-esteem on a subscale of the TMA, the Italian version of the Bracken's multidimensional self-esteem scale (Bracken, 1993; range 0–7) and to indicate how many days a week they usually wore make-up (from 0 to 7 days per week). In addition, all participants performed the forward and backward digit span and the word fluency test (maximum

Table 1. Participants demographic characteristics according to condition

	Make-up		Listening to music		Face coloring		p-value
	Mean	SD	Mean	SD	Mean	SD	
Age	19.71	1.23	19.77	1.08	19.66	0.72	0.83
General psychology examination score	26.52	1.02	26.5	1.14	26.47	1.19	0.97
Self-esteem	4.42	0.59	4.26	0.83	4.41	0.86	0.41
Forward digit span	6.69	1.69	7.00	1.62	6.63	1.74	0.43
Backward digit span	5.11	1.33	4.98	1.46	4.97	1.38	0.82
Word fluency	12.62	1.69	12.51	1.80	12.7	1.86	0.83
Mood T0	4.11	2.13	4.06	1.69	4.09	2.03	
Mood T1	5.14	1.42	5.11	1.63	4.19	1.96	
Perceived beauty T0	4.09	1.81	4.13	1.72	3.87	2.05	
Perceived beauty T1	5.27	1.63	4.18	1.63	3.95	1.98	
Multiple-choice test score	24.21	5.34	22.16	4.25	19.98	4.09	

Note: N = 62 each group.

score 34) in which they were required to name as many words as possible beginning with a specified letter (c or p) in 60-s interval (Mondini, Mapelli, Vestri, et al., 2011). These preliminary data were collected in order to select students matched in terms of level of general physical self-esteem, make-up habits, general cognitive abilities and knowledge about principle and foundations of General Psychology., 114 participants were excluded (of these, 109 students obtained a grade lower than 25 or higher than 28 and five refused to come back without wearing make-up for the second part of the experiment).

We randomly created three experimental groups (each consisting of 62 students). The three groups did not differ in age ($p = 0.83$), make-up frequency ($p = 0.97$), self-esteem scores ($p = 0.41$), forward ($p = 0.43$) and backward digit span scores ($p = 0.82$), word fluency test scores ($p = 0.83$) and General Psychology examination grade ($p = 0.97$) (25–28 range; see Table 1). This grade range is representative of a medium to high competence level in General Psychology. Because the text regarded concepts in General Psychology, we chose to limit the grade range in order to have participants with comparable knowledge about General Psychology.

At the end of day 1, all participants were dismissed and asked to come back at a later day without wearing make-up.

Each participant was tested individually in a quiet room in our laboratory (day 2). All participants were informed that this was a study about the role of learning and memory and that their learning was going to be tested. At the beginning of the experiment (T0), all participants were asked to rate their mood on a seven-point scale (from 1 – absolutely negative to 7 – absolutely positive) and to indicate how beautiful they felt (from 1 – absolutely ugly, to 7 – absolutely beautiful).

Subsequently, they were asked to silently read and study a brief chapter from a General Psychology textbook, which they had never studied before. The General Psychology examination was chosen because it is the first exam taken by first-year psychology students and we wanted to ensure that the learning phase of our study was not influenced by previous knowledge. Participants were given 30 min and were told to study the chapter for a subsequent simulated examination (multiple-choice test) and informed that if they passed the examination they would be given extra-course credit. Subsequently, participants were assigned to one of three different group conditions. Participants assigned to the *make-up group* sat in front of a table where there was a bag with different cosmetics

and a mirror. They were invited to put make-up on as they usually did before going out. All participants in this condition wore make-up. Participants assigned to the *face coloring group* sat in front of a table where there were colors and a black-and-white drawing of a schematic face. They were invited to color the face as if they were using cosmetics. Participants assigned to the *positive music group* condition sat in front of a table where there was a laptop and a colorful toy xylophone. They wore headphones and listened to Mozart's *Eine Kleine Nacht Musik, Divertimento #136*. This music excerpt has been repeatedly shown to induce positive mood (e.g. Storbeck & Clore, 2005). During music listening, participants were asked to try to reproduce some notes of the excerpt on the xylophone. All participants were given 15 min independently of the group condition. After 15 min, they were asked to rate (T1) their mood and their level of perceived beauty again. Finally, participants answered 30 multiple-choice questions about the studied chapter. Task completion was self-paced but never exceeded 40 min.

3. Results

3.1. Manipulation check

A 2 (T0 vs. T1) by 3 (Make-up vs. Positive Music vs. Face Coloring) mixed ANOVA on the self-assessed mood scores detected a significant main effect of time, $F_{(1,183)} = 80.69, p < 0.001, \eta_p^2 = 0.31$, because higher scores were given in T1 than in T0. Most importantly, the two-way interaction was significant, $F_{(2,183)} = 15.16, p < 0.001, \eta_p^2 = 0.14$ (Figure 1). This was due to the fact that participants that wore make-up and listened to positive music gave higher scores in T1 than in T0 (Tukey test $p < 0.001$). No differences were found for participants belonging to the face coloring group. The *post hoc* analysis of T1 showed that both the make-up group and the group listening to music gave higher scores to the self-assessed mood compared to the face coloring group ($p < 0.05; p < 0.05$). No differences were found in mood scores between the make-up and the positive music groups ($p = 0.98$). No differences between groups were found in T0.

A 2 (T0 vs. T1) by 3 (Make-up vs. Positive Music vs. Face Coloring) mixed ANOVA on self-perceived beauty scores detected a significant main effect of the make-up group, $F_{(2,183)} = 3.15, p < 0.05, \eta_p^2 = 0.033$, because participants that wore make-up gave higher scores than participants that colored a face. The main effect of the time was also noticed, $F_{(1,183)} = 44.06, p < 0.001, \eta_p^2 = 0.19$, because higher scores were given in T1 than in T0. The two-way interaction was significant, $F_{(2,183)} = 31.99, p < 0.001, \eta_p^2 = 0.26$, indicating that participants who wore make-up gave higher scores in T1 than in T0 (Tukey's test $p < 0.001$) (Figure 2). No differences were found for participants that colored a face

Figure 1. Interaction time × group in self-reported mood.

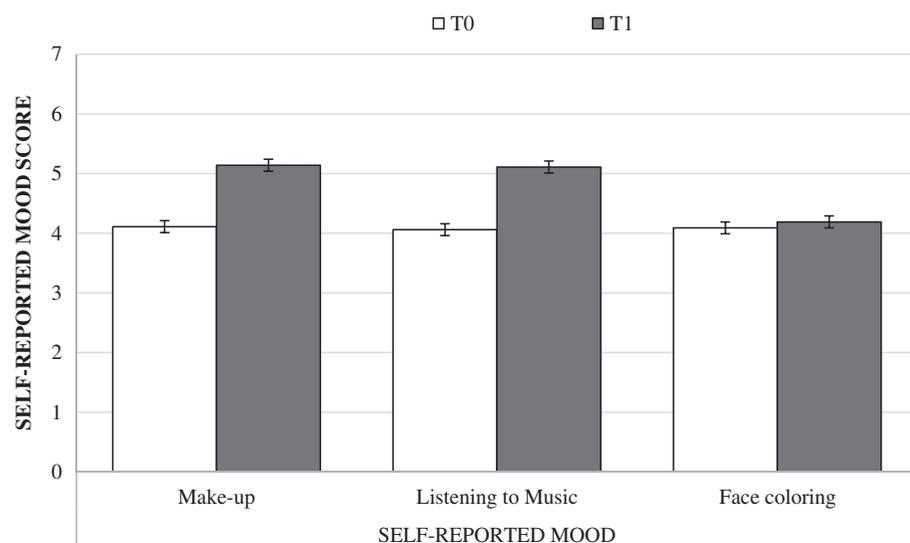


Figure 2. Interaction time × group in self-reported beauty.

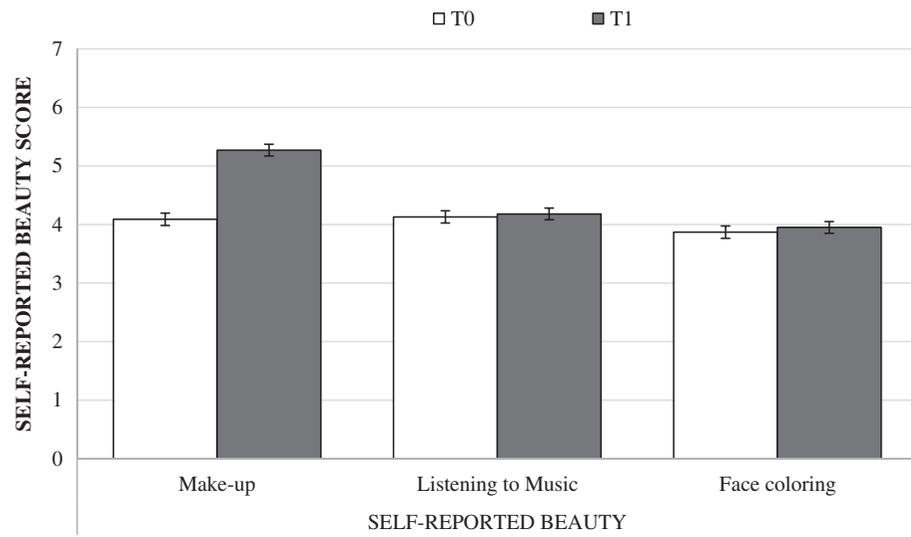
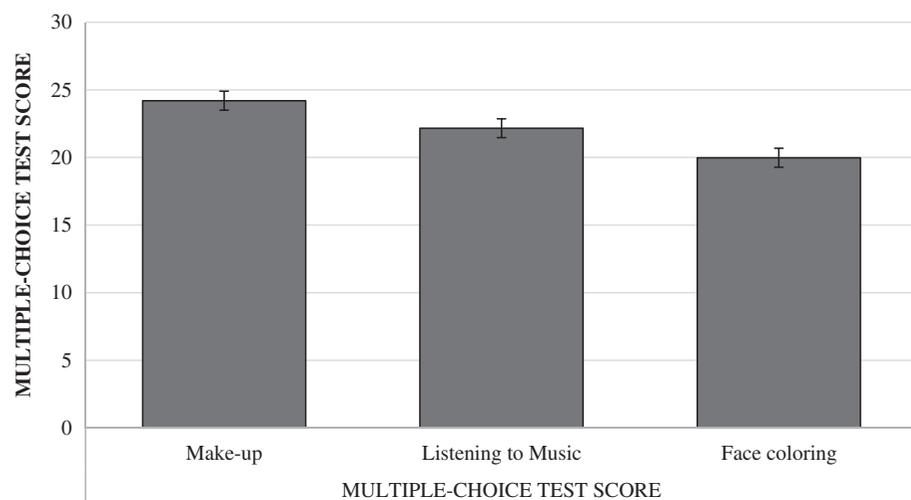


Figure 3. Differences in multiple-choice test score between groups.



and listened to the positive music excerpt. The *post hoc* analysis on T1 showed differences in the perceived beauty between the make-up and the positive music groups ($p < 0.005$) and the face-coloring group ($p < 0.001$). No differences were found between the group listening to music and the face-coloring group ($p = 0.98$). No differences between groups were found in T0.

3.2. Multiple-choice task

The one-way ANOVA (Make-up vs. Positive Music vs. Face Coloring) on the multiple-choice test scores was significant, $F_{(2,183)} = 13.1$, $p < 0.001$, $\eta_p^2 = 0.12$, because participants who wore make-up obtained higher scores than participants that listened to music (Tukey's test $p < 0.05$) and colored a face (Tukey's test $p < 0.001$). Moreover, participants that listened to music obtained higher scores than participants that colored the face (Tukey's test $p < 0.05$; see Figure 3).

4. Conclusions

The role of self-esteem and emotions in enhancing the cognitive performance has been widely investigated (Alves-Martins et al., 2002; Mammarella et al., 2016a; Palumbo, D'Ascenzo, Quercia, & Tommasi, 2017; Richardson et al., 2012). In this study, we aimed to explore whether or not wearing make-up can increase the level of perceived beauty, with consequent enhancement of self-esteem,

resulting in better cognitive performance. In order to test our hypothesis, we divided our sample in three different groups (wearing make-up, listening to classical music and face coloring).

In line with our predictions, we found a significant effect of make-up on a multiple-choice test performance, with scores being significantly higher compared to those obtained after listening to positive music and coloring a face. In addition, we found a significant increase in cognitive performance after listening to a positive music excerpt. However, students from the positive music group were not influenced as much as the make-up group was. In order to better understand our results, it is important to look at the results of the self-reported mood and the self-reported beauty. Regarding the self-reported mood, our *post hoc* analysis showed a higher score for the make-up and the listening to music group compared to the face-coloring group. These results suggest that both make-up and music seem to have enhanced the positive mood of the participants resulting in better cognitive performance. Our results seem to align with previous literature suggesting the self-perceived beauty (e.g. Datta Gupta, Etcoff, & Jaeger, 2016) and listening to positive music (e.g. Schellenberg & Weiss, 2013) can enhance positive emotions. All together, these findings replicate the classical benefit that positive emotions may exert on cognition (Mammarella, Di Domenico, Palumbo, & Fairfield, 2016c; Mather & Carstensen, 2005).

Another interesting result can be found in the *post hoc* analysis of the self-perceived beauty. While the makeup group and the listening to music group did not differ in the self-reported mood, it is important to notice that the *post hoc* analysis on the self-reported beauty showed a higher score for the make-up group only, thus suggesting that wearing makeup has increased the self-beauty perception of the participants. All together, these results, could lead to speculate that wearing make-up could have increased the participants' level of self-beauty perceived, consequently enhancing self-esteem, resulting in improvement of cognitive performance compared to the other groups. If confirmed, these findings seem to be in line with the literature showing a relation between beauty and self-esteem (Bale & Archer, 2013; Mafra, Castro, & Lopes, 2016). One factor contributing to the effectiveness of the lipstick effect is its emphasis on the amelioration of physical appearance that did not occur in the other two conditions. The make-up group and the listening to music group showed a difference in the cognitive performance and self-beauty perception but not in the self-reported mood. This finding may be explained in terms of classical self-efficacy and cognition interaction models (e.g. Paunonen & Hong, 2010).

These data indicate that positive emotions are not the sole mechanism responsible for the observed enhancement. It should be noted that even though make-up was effective in bettering performance, researchers need to explore additional means to increase academic achievement (e.g. for male students) and whether or not the simulated scenario used in this study can be extended to a real-life situation. Also, our study assessed only the immediate effect of make-up on cognitive performance. Further research needs to explore whether make-up has longer lasting effects on cognitive performance. Altogether, our results offer new insight into the ways in which physical self-esteem may interact with cognition via make-up and is one of the first to highlight the importance of physical self-esteem and cosmetics in affecting cognitive performance. Finally, our study supports a more multidimensional approach to the study of learning and memory among female students.

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Competing Interests

The authors declare no competing interest.

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