RESEARCH ARTICLE

The Face of Sexualization: Faces Wearing Makeup are Processed Less Configurally than Faces Without Makeup

Philippe Bernard, Philippine Geelhand and Lara Servais

Human bodies are sometimes cognitively objectified, i.e., processed less configurally and more analytically, in a way that resembles how most objects are perceived. Whereas how people process images of sexualized bodies appearing in the mass media has been well documented; whether subtler manifestations of sexualization, such as wearing makeup, might elicit cognitive objectification of ordinary women's faces, remains unclear. The present paper aims at filling this gap. We hypothesized that faces wearing makeup would be processed less configurally than faces wearing no makeup. Sixty participants took part in a face recognition task, in which faces wearing or not wearing makeup were presented. In regards to faces with no makeup, people recognized face parts better in the context of whole faces than in isolation, which served as evidence of configural processing. In regards to faces wearing makeup, face parts were recognized equally well when presented in isolation vs. in the context of whole faces; evidence of a lower configural processing. That pattern of results was driven by eye makeup (vs. lipstick). Implications for research on objectification and sexualization are discussed.

Keywords: sexualization; makeup; cognitive objectification; configural and analytic processing; whole/parts paradigm; face perception

Objectification Theory (Fredrickson & Roberts, 1997) suggests that women are reduced to their bodies and physical appearance in Western cultures, as illustrated by the pervasive use of sexualization in the media. Sexualization is a set of features that emphasize sexiness through a focus on body parts (e.g., women wearing revealing clothing) and face parts (e.g., flashy lipstick and “smoky eyes”: Smolak, Murmen, & Myers, 2014). Content analyses of advertisements revealed that women's bodies and faces are frequently portrayed in a sexualized manner in visual media (Stankiewicz & Roselli, 2008). As a result, American women spend billions of dollars on cosmetics each year to meet these sexualized standards of beauty (Kumar, 2005), enhancing their perceived beauty and attractiveness (Graham & Jouhari, 1981). Cosmetics may also modulate impressions regarding women's personality, although research has found mixed results: Women wearing makeup are evaluated sometimes more positively (e.g., warmer), and often more negatively (e.g., less moral) (for a review, see Richetin, Huquet & Croizet, 2007).

Beyond impression formation, very little is known regarding how makeup shapes the way people visually process women's faces. Indeed, most sexualization and objectification studies have focused on how people visually process and attribute mind to sexualized bodies appearing in mass media (for reviews, see Bernard, Gervais, & Klein, 2018; Ward, 2016). The present paper examines whether face sexualization—or the emphasis of sexiness through facial cues—changes the way people see ordinary women's faces. We suggest that face sexualization, akin to body sexualization, may trigger cognitive objectification. That is, that faces with makeup may be processed less configurally than faces without makeup.

Cognitive Objectification: When People Are Cognitively Reduced to Their Parts

Consistent with the tenets of Objectification Theory (Fredrickson & Roberts, 1997), research has shown that sexualized female bodies are rated as lacking in mind and moral status (e.g., Loughnan et al., 2010) and as possessing less agency (Gray, Knobe, Sheskin, Bloom, Barrett, 2011), less uniquely human traits (Vaes, Paladino, & Puvia, 2011), less competence, less warmth and less morality (Bernard & Wollast, 2019) than nonsexualized women. Departing from this line of research that envisioned objectification through a content-focused approach (i.e., diminished attributions of human-like traits to a person), a recent body of research has started to examine the cognitive processes underpinning objectification.

A vast literature in psychology and neuroscience demonstrates that people process a stimulus either as a global physical entity (i.e., configural processing), as if the focus was on the forest, or as a set of parts (i.e., analytic processing), as if the focus was on the trees (Maurer, Le Grand, & Maurer,
Configural processing depends on the spatial relations among the stimuli’s parts, which are recognized when presented in the context of the overall stimulus, whereas analytic processing depends solely on the stimulus’ parts, regardless of their configuration. Whereas bodies and faces are typically processed configurally, objects are typically processed analytically, or at least less configurally than bodies and faces (for a review see Maurer et al., 2002). This phenomenon has been observed at an early stage of visual processing, based on electroencephalography (EEG), and a method that records millisecond-by-millisecond neural activations evoked by stimuli (for a review see de Gelder & de Gelder, 2004), indicating that more cognitive resources are needed to process them, because inversion impairs the ability to rely on configural information.

Relevant here, a growing body of research has shown that sexualized bodies may be cognitively objectified (i.e., no longer processed as a physical global entity, but instead cognitively reduced to their constituent parts, similarly to how most objects are perceived; Bernard, Gervais, et al., 2018). For example, Bernard, Rizzo et al. (2018) found larger N170 over female than male sexualized bodies whereas N170 amplitudes did not differ between inverted and upright exemplars for sexualized bodies and for objects. This suggests that sexualized bodies were processed more analytically than nonsexualized ones (for an examination of the respective role of nudity and posture suggestiveness on cognitive objectification, see Bernard et al., 2019). Furthermore, in line with the idea that configural processing requires more cognitive resources when stimuli are presented in a part-based manner (Soria Bauser & Suchan, 2018), Bernard and colleagues found that scrambled nonsexualized bodies triggered larger N170 compared to scrambled sexualized bodies (Bernard, Content, Deltenre, & Colin, 2018). In contrast, N170 amplitudes were similar for scrambled and whole sexualized bodies, and a similar pattern emerged for objects, suggesting that sexualized bodies were processed more analytically than nonsexualized ones. Such studies have mostly examined the extent to which disrupting configural processing affects the amplitude of the N170, a negative component triggered by visual stimuli following a 170 ms onset. While the N170 amplitude for upside-down and upright objects does not differ, indicated analytic processing, inverted faces and bodies trigger larger N170s than upright ones (e.g., Stekenenburg & de Gelder, 2004), indicating that more cognitive resources are needed to process them, because inversion impairs the ability to rely on configural information.

Why Would Women’s Faces Wearing Makeup Be Cognitively Objectified?

Cognitive objectification studies have been informative regarding how people visually process images of sexualized bodies that appear in the visual media, but they have neglected nonsexualized bodies. For example, Bernard et al. (2018a) found that female body parts were better recognized in the context of the whole body rather than in isolation. In contrast, the recognition of sexual female body parts was improved when body parts were presented in isolation (vs. in the context of whole bodies). Female bodies were thus processed less configurally and more analytically than male bodies. Likewise, using the same task but with sexualized and nonsexualized bodies, Bernard, Gervais, Allen, and Campomizzi (2015) found that female body parts were better recognized in isolation than in the context of whole bodies whereas male body parts were equally well recognized in isolation vs. in the context of whole bodies.

Findings of the current study are consistent with the idea that the presence of sexualized features makes nonsexualized bodies seem more sexualized than whole bodies make them seem (Bernard, Gervais, Allen, Campomizzi, & Klein, 2018). Furthermore, in line with the idea that configural processing requires more cognitive resources when stimuli are presented in a part-based manner, a decision phase was added to select the original picture among renditions of modified pictures. We opted for modifications too salient and easy to detect, resulting in a ceiling effect. For face parts trials, the stimuli were identical except that the original vs. modified face parts were presented in isolation (i.e., not in the context of the whole face) in the decision phase (picture size = 6.30 × 1.50 inches). The recognition task included 96 trials and lasted approximately 10 minutes. Recognition scores were computed as the percentage of correctly identified pictures for a given stimulus category. We agree to share on request anonymized data files from this research with other qualified professionals in order to confirm the conclusions of the research.

Results

Manipulation Check

Participants rated women’s faces wearing makeup as more sexualized (M = 3.39, SE = 0.24) than the same faces without makeup (M = 1.41, SE = 0.08), F(1, 57) = 81.32, p < 0.001, 95% CI = [15.42, 24.1], r² = 0.59. Moreover, faces with makeup were evaluated as wearing more makeup (M = 4.95, SE = 0.19) than the same faces without makeup (M = 1.27, SE = 0.07), F(1, 57) = 37.08, p < 0.001, 95% CI = [3.69, 6.39].

Method

We reported manipulations and exclusions in the pre-registration of the experiment (http://aspredicted.org/bling-faces-checks). Based on the effect of face sexualization on face processing was moderated by the interaction between recognition task and target sex found by Bernard, Gervais, Allen, Campomizzi et al. (2015) who used a whole/body parts paradigm including images of sexualized bodies (i.e., d = 0.46), G Power indicated that a sample size of 52 participants was necessary to detect such an effect size, with p = 0.05 and a power of 0.90. Fifty college students took part in the experiment. Prior to analysis, we performed a median absolute deviation (MAD) outlier analysis (Leys, Ley, Klein, Bernard, & Licata, 2013) with a conservative criterion (±3 MAD) on both recognition scores and reaction times. However, the reaction times of two participants were extremely slow (+1 MAD). These participants were excluded from the sample for the instructions stressed the importance of responding as quickly as possible. The final sample included 50 participants (54 women; Mₚ = 19.90, SD = 2.53; 72% of the sample was either Belgian or French), who were college students taking part in the present experiment in exchange for course credit.

Participants took part in a whole face and face parts recognition tasks on this theory of cognitive objectification. We filled out a questionnaire including socio-demographic and manipulation check questions (‘This woman wears a lot of makeup’ and ‘This woman is depicted in a sexualized manner’). The manipulation check questions were followed by a decision task, in which participants had to select one of two renditions of modified pictures after selecting that face part. We opted for modifying face parts instead of using different exemplars of face parts as distractors because the latter strategy would have rendered modifications too salient and easy to detect, resulting in a ceiling effect. For face parts trials, the stimuli were identical except that the original vs. modified face parts were presented in isolation (i.e., not in the context of the whole face) in the decision phase (picture size = 6.30 × 1.50 inches). The recognition task included 96 trials and lasted approximately 10 minutes. Recognition scores were computed as the percentage of correctly identified pictures for a given stimulus category. We agree to share on request anonymized data files from this research with other qualified professionals in order to confirm the conclusions of the research.

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Figure 1: Examples of Face Stimuli Without and With Makeup.
Recognition Performance
We submitted recognition scores to a 2 (face sexualization: no makeup vs. makeup) × 2 (recognition task: whole; isolated parts) × 2 (face parts: eyes; mouth) repeated measures ANOVA. The main effect of face sexualization was not significant, \( F(1, 57) = 0.95, p = 0.343, 95\% CI = [-0.010, 0.030], \eta^2_p = 0.002 \). ANOVA yielded a main effect of recognition task, \( F(1, 57) = 5.12, p = 0.028, 95\% CI = [0.003, 0.043], \eta^2_p = 0.010 \), with face parts better recognized in the context of whole faces (\( M = 0.65, SE = 0.013 \)) than in isolation (\( M = 0.62, SE = 0.013 \)).

Contrary to our hypothesis, the interaction between face sexualization and recognition task was not significant, \( F(1, 57) = 1.72, p = 0.195, \eta^2_p = 0.030 \). However, a significant interaction was found between face sexualization, recognition task and face parts (i.e., eyes vs. mouth) emerged, \( F(1, 57) = 3.27, p = 0.013, \eta^2_p = 0.05 \). We thus examined whether the interaction between recognition task and face sexualization was moderated by face parts. As expected, for faces wearing no makeup (see Figure 2), we found a main effect of recognition task, \( F(1, 57) = 4.87, p = 0.031, 95\% CI = [0.004, 0.073], \eta^2_p = 0.08 \), with face parts better recognized in the context of whole faces (\( M = 0.68, SE = 0.016 \)) than when presented in isolation (\( M = 0.64, SE = 0.016 \)) and this pattern was not moderated by face parts, \( F(1, 57) = 0.27, p = 0.053, \eta^2_p = 0.010 \). Importantly, and supporting our hypothesis, the main effect of recognition task was not significant for faces wearing makeup, \( F(1, 57) = 0.29, p = 0.594, 95\% CI = [-0.020, 0.044], \eta^2_p = 0.005 \), with face parts recognized equally well in the context of whole faces (\( M = 0.657, SE = 0.014 \)) than in isolation (\( M = 0.650, SE = 0.013 \)). This pattern was qualified by a significant interaction between recognition task and face parts, \( F(1, 57) = 5.41, p = 0.024, \eta^2_p = 0.09 \) Eyes with makeup were equally well recognized regardless whether eyes were presented in the context of the whole faces (\( M = 0.66, SE = 0.021 \)) vs. in isolation (\( M = 0.69, SE = 0.019 \)).

Recognition Times
A separate 2 (face sexualization: no makeup, makeup) × 2 (face parts: eye, mouth) repeated measures ANOVA revealed a main effect of recognition task, \( F(1, 57) = 85.53, p < 0.01, 95\% CI = [66.95, 95.50], \eta^2_p = 0.60 \). Faces presented in the context of whole faces were associated with slower responses (\( M = 3470 \) ms, SE = 149) than when presented isolated (\( M = 2685 \) ms, SE = 96). The main effect of face sexualization, \( F(1, 57) = 0.80, p = 0.38, 95\% CI = [-1.14, 5.55], \eta^2_p = 0.01 \), the interaction between face sexualization and recognition task, \( F(1, 57) = 0.63, p = 0.43, \eta^2_p = 0.01 \), as well as the interaction between face sexualization, recognition task and face parts, \( F(1, 57) = 0.11, p = 0.74, \eta^2_p = 0.002 \), were not significant (for additional secondary results, see Supplementary Materials).

In sum, participants spent more time looking at pictures of women’s faces than at face parts during the recognition phase. Importantly, the absence of interaction between face sexualization and recognition task suggests that the lower configural processing of faces with makeup is not driven by more time spent at looking at these stimuli.

Limitations and Future Directions
It is worth noting that the effect of makeup on diminished configural processing was driven by eye makeup, not by lipstick. These results seem meaningful in light of previous studies done in the lab that found that the eye region plays a critical role in configural face processing. For instance, it has been proposed that the larger N170 typically found for inverted (vs. upright) faces might be due to the activation of eye processing (Russell, 2003). The fact that selective areas are inhibited when eyes are presented in the context of a face for which configural information is not encoded, i.e., in the context of upright faces (Russell, 2003; Alain, Sedore, & Itier, 2007). The eye region should rely on such EEG paradigms to test the role of faces with makeup while using eye-tracking devices. It is possible that mascaras creates a greater facial contrast with eyeliner, which may attract attention from participants. If this explanation is true, then one may expect that people would focus more rapidly and for more time on the eyes than on the mouth when looking at faces-wearing makeup.

On another note, one may wonder whether our results might simply reflect that women are ‘ordinary’ experts in facial makeup because they frequently use it. Research in neuropsychology (Moll, 2010), consistent with this possibility. Indeed, it has been shown that, after two weeks of expertise training with novel objects (initially perceived analytically), people appraise them configurally (Rossini, Gauthier, Goffaux, Tarr, & Crommelinck, 2002). In other words, applied to our research, familiarity/expertise with makeup would have translated into configural processing of faces with cosmetics, not the opposite. However, whether people faces without makeup and this pattern was specifically driven by eye makeup, not by lipstick. Mouths with lipstick were better recognized in the context of whole faces. In contrast, we found that eyes with makeup were equally well recognized in isolation than in the context of whole faces, indicating that eye makeup caused a specific analytic processing of these face parts. The absence of interaction between recognition task and makeup when considering reaction times suggests that the differences found in the recognition performance for faces with and without makeup were not driven by a speed-accuracy bias (e.g., longer reaction times associated with the recognition of face parts for faces with makeup vs. no makeup).

We conducted research that showed focusing on people’s faces might tempt the effects of appearance-focus and sexualization on cognitive objectification (Bernard, Vervaeke, & Dodd, 2018; Vervaeke, Dodd, & Bernard, 2013; Nummenmaa, Hietanen, Santila & Hyöniä, 2012) and related dehumanization (Gray et al., 2011; Loughan & Bardwell, 2003). Our results suggest that our manipulation may not be efficient when faces are sexualized, especially through the use of eye makeup (e.g., mascara).
participants, we were not able to test the moderating role of gender. As mentioned in the pre-registration, we had no a priori hypothesis about this. This possibility seemed indeed unlikely given that all cognitive objectification studies found no evidence in favor of such moderation. For a review on Bernard, Gervais et al. (2018). Nonetheless, it would be ideal for future research to replicate this experiment to test whether the effect of cosmetics on face processing are generalizable to male faces.

Our research focused on the cognitive processes involved in the perception of sexualized faces. Future research should uncover the social implications of face sexualization. As we noted that sexualized faces with makeup, akin to sexualized bodies, might be seen as possessing less humanness and mind than faces without makeup. This possibility seems plausible in the light of research showing that faces with heavy makeup are perceived as being e.g., less moral, more frivol and more superficial than women’s faces without makeup (for a review, see Richetin et al., 2007). It might be that faces wearing makeup are processed less configurally because they are perceived as possessing less mind and humanness, which is consistent with recent investigations that showed that sexualized bodies (e.g., Bernard, Content et al., 2018; Bernard, Rizzo et al., 2018) as well as dehumanized people (e.g., norm violators: Fincher & Tetlock, 2016) are processed less configurally. Relatedly, an important question for future research is to examine the relationships between configural processing of faces with makeup and impression formation to determine whether cognitive objectification and related dehumanization are related or independent phenomena. For instance, altering configural face information (i.e., by presenting faces in an inverted position) impairs the ability to categorize faces as human and as possessing human-like traits (Hugenberg et al., 2016). Testing whether cognitive objectification of faces causes dehumanization would enable to uncover the potential negative consequences of face objectification and related dehumanization focusing. Loughman et al., 2013; tolerance toward sexual harassment: Bernard, Legrand, & Klein, 2018.

This paper introduced the notion that sexualization can be communicated through facial cues such as makeup. We have demonstrated that makeup contributes to processing women’s faces less configurally and more analytically in a way that resembles the way most objects are processed. We hope this research will invite researchers to further explore how and why face sexualization affects the way people see ordinary women as well as the behavioral consequences of this phenomenon.

Additional File: The additional file for this article can be found as follows:

- **Supplementary Materials.** Secondary results. DOI: https://doi.org/10.5334/rsp.2113

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**Competing Interests**
The authors have no competing interests to declare.

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