Characteristics of physical attractiveness. Shape processing of dressed and naked realistic female bodies varying in WHR and observer perspective in heterosexual men and women: behavioral and electrophysiological experiments

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Summary

The WHR, reflecting the fat distribution, is a relevant measure of female physical attractiveness and an indicator of female health and reproductive capacity. Previous studies mainly investigated the divergence of WHR preferences between cultures and brain areas and body processing in relation with face processing, body motions or body expressions. However, no study has investigated the characteristics of physical attractiveness in heterosexual observers at behavioral and electrophysiological levels.

The purpose of this study was thus to investigate with a behavioral experiment the characteristics of physical attractiveness of naked and dressed female bodies, presented in different Waist-to-Hip Ratios (WHRs of 0.6, 0.7, 0.8 and 0.9) and from two perspectives (back and front) in heterosexual observers of both genders, and, secondly, to investigate the time course of cerebral activation for these biologically relevant sexual stimuli with an electrophysiological experiment. We wanted to investigate whether the N190 and P1 components were modulated by stimuli evaluated as more physically attractive in the previous behavioral experiment.

We proceeded with two experiments, one evaluating the judgment of physical attractiveness at a behavioral level by asking participants (mean age: 27.9 years) to rate the level of attractiveness of female bodies and the other one investigating the brain activation associated with these stimuli that participants (mean age: 25.6 years) see scrolling on a screen.

In the behavioral experiment, naked female bodies with a WHR of 0.7 seen from the back were evaluated as more physically attractive for both gender. In the electrophysiological experiment, the P1 occurred between 122 ms and 162 ms after stimulus onset and peaked at 144 ms on average, whereas the N190 was observed between 158 ms and 217 ms, with mean peak at 185 ms in the occipital cortex. The processing of the female body shape thus occurs very early, during the first 200 ms of viewing. The N190 and P1 components were sensitive to the categories related to our female bodies (i.e., WHR, clothing and perspective). The N1 seems more sensitive to the whole body shape, whereas the P1 seems more sensitive to body features like the WHR. Consequently, this study yields important results for the relevant characteristics of perceived sexual attractiveness of female bodies and their underlying cerebral mechanisms.

Keywords: female physical attractiveness, waist-to-hip ratio (WHR), secondary sexual characteristics, body shape processing, electroencephalography, visual body perception, sexual behavior.

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1. Introduction

What is the decisive factor in human physical attractiveness, specifically when considering women? Are there preferences for certain traits? And if so, what are they and where do they come from? The field of physical attractiveness appears to interest a large number of people, paying attention to their bodies, since physical appearance is important in a lot of aspects of everyday life like the mate selection (Singh, 2002). This trend is seen in beauty contests for instance, where it was shown that the ideal of body has become thinner over the years, between the 60s and 80s (Garner et al., 1980, cited by Swami, Antonakopoulos, Tovée & Furnham, 2006a).

Several criteria of dimensions seem to influence the judgment of feminine physical attractiveness, like the Body Mass Index (BMI) and the Waist-to-Hip Ratio (WHR). They seem to affect the attractiveness rating because, according to evolutionary psychology, they convey information about the woman's genetic potential, and also her potential reproductive success. In this context, our work will address the perception of human bodies, more specifically, the female body shape processing in female and male heterosexuals observers, an area not yet explored in this way to our knowledge. We will focus on a secondary sexual characteristic of female bodies, the WHR, investigating it alongside with the influence of other features, such as the view perspective of female bodies - if the body is viewed from front vs. from back - and also the influence of clothing vs. nudity on the physical attractiveness rating. In order to see which features are evaluated as the most attractive and how this modulates the brain activity, we have taken behavioral and electrophysiological measures using two experiments. The first behavioral experiment, a rating task, allows us to investigate which features are evaluated as most attractive and the second electrophysiological experiment allows us to study the brain activation associated with such perceived attractive features.

In this work, the theoretical framework of research on physical attractiveness characteristics of female bodies will be first presented. In connection with this topic, the factors involved in physical attractiveness will be clarified, in particular the WHR as a sexual secondary trait. Then, some main results concerning the field of body and sexual stimuli processing will be discussed in link with neuroimaging and neurophysiology studies. In the second part, the empirical aspects of the behavioral experiment and then of the electrophysiological experiment will be described, namely the population sample, the method and the procedure used, the hypotheses and the statistical analyses performed. After describing the main results, we will conclude with the critical discussion.

2. Theoretical framework

2.1 Physical attractiveness of female bodies

In this section the factors involved in physical attractiveness will be discussed, following which specific explanations concerning the WHR as a reliable indicator of female health and reproductive potential will be given. In connection with this morphological trait, we will then discuss its possible influences in terms of preference. Finally, the evolutionary perspective will be proposed as a rational explanation for the WHR.

2.1.1 Factors involved in physical attractiveness

A number of **traits** are relevant in human **physical attractiveness** rating and also in mate choice. For female physical attractiveness, such features are the Waist-to-Hip Ratio (WHR), the Body Mass Index (BMI), the facial appearance and symmetry, and other sexual secondary characteristics like the breast size (Currie & Little, 2009; Swami, Miller, Furnham, Penke & Tovée, 2008). Among these features, the WHR and the BMI have been found to be the principal cues of female physical attractiveness (Swami et al., 2006a). The BMI represents the weight divided by the height squared (kg/m^2) (Tovée & Cornelissen, 2001) and thus concerns the overall body fat, independently of the fat localization (Cornelissen, Hancock, Kiviniemi, George & Tovée, 2009). This index is a crucial factor in the female attractiveness (Dixson, Dixson, Bishop & Parish, 2010) and it was shown that a low BMI has a big impact on the health and on the reproduction potential of women (Swami & Tovée, 2005). Like the BMI, the **WHR** is also a crucial **predictor of physical attractiveness**, reporting female fertility and health (Singh, 2002).

2.1.2 WHR as a reliable indicator

In this work, we will focus on the WHR, reflecting how the fat is distributed, in the upper or the lower body. It concerns the **female body shape** and is measured by the ratio of the width of the waist (narrowest portion between the ribs and the iliac crest) to the width of the hips (at the greatest protrusion of the buttocks) (Furnham, Mistry & McClelland, 2004; Tovée & Cornelissen, 2001). The WHR thus provides a reliable sign of the **fat distribution** (Dixson, Dixson, Li & Anderson, 2007a) and the WHR of a healthy woman during the fertile period is between 0.67 and 0.8, whereas it is between 0.85 and 0.95 in healthy men (Henss, 1995).

It appears that the WHR is a reliable **indicator** of female **health** and **reproductive capacity** (Singh, 2002). Indeed, a **low WHR** (i.e., a curvaceous body, typically of 0.7) represents the optimal fat distribution for the best female fertility (Singh, 2002; Swami & Tovée, 2005), since a low WHR is an indicator of a regular ovulation cycle, of a sufficient storage of omega-3 useful for the fetal neural development (Dixson et al., 2010) and is not related to pregnancy (Furnham et al., 2004). Moreover, the WHR is a **dimorphic trait**, in the sense that there is a difference in WHR between genders, since fat deposits are regulated by sex hormones. The action of estrogen is to stimulate the fat deposits in thighs and buttocks and inhibit them in the abdominal area, whereas the testosterone acts in the opposite way (Molarius et al., 1999, cited by Singh, 2002). Women thus have more fat in their hips and less fat in their abdomen. After the onset of puberty, women have a smaller WHR as compared to men, but with age, the WHR of women increases to become again identical to the WHR of men as before the puberty, because of the decreasing estrogen levels during menopause (Arechiga et al., 2001, cited by Singh, 2002). Consequently, the interval when women have a smaller WHR than men corresponds to their reproductive period. It was shown that a small waist size is associated with a high level of estrogen and progesterone, which are predictors of the **reproductive potential**; the WHR is thus a reliable cue of estrogen level (Dixson, Grimshaw, Linklater & Dixson, 2011; Jasienska, Ziomkiewicz, Ellison, Lipson & Thune, 2004). Indeed, in a study of Jokela (2009), it was found that women evaluated as more attractive had a higher reproductive success, having more children. Moreover, there exists also a link between the WHR and the female **health**. Indeed, women with higher WHRs are more likely to present coronary lesions (Kortelainen & Sarkioja, 1999, cited by Singh, 2002), anxiety and depression (Nelson, Palmer, Pedersen & Miles, 1999, cited by Singh, 2002), as compared to women with lower WHRs. This ratio is therefore a reliable indicator of many traits attributed to the health and reproductive success of women.

Some authors argue that the WHR may act like a **first filter** in the male evaluation of female bodies. For instance, Dixson et al. (2011) have explored, with eye-tracking, the frequency of visual fixations when men viewed photographs of naked female bodies from front view, depicting two WHRs (0.7 vs. 0.9) and three breasts sizes (small vs. medium vs. large). Results showed that the first visual fixation appeared 200 ms after stimulus onset mainly on the breasts and on the waist, as compared to the lower body and the face. Moreover, men **rapidly** made the **WHR rating**, evaluating pictures with a WHR of **0.7** (i.e., medium size) as the most attractive ones, independently of the breast size, and then spent more time concentrating on the breasts. Consequently, men first analyzed the female body shape: the WHR seems thus to act like a first filter, which spontaneously excludes unhealthy, or pregnant women, or those with a lower reproductive success (i.e., WHR of 0.9) (Dixson et al., 2011; Singh, 1993). As a result, this study shows that the WHR is a main feature in the physical attractiveness assessment of female bodies in male observers (Dixson et al., 2011).

2.1.3 WHR and its influences

As discussed above, a lot of virtues seem to be attributed to a low WHR. However, is a low WHR always evaluated as more attractive: is it constant for all people, for every kind of relationship, and across various cultures? We will now focus specifically on the main results concerning the physical attractiveness of female bodies to see whether there is a specific WHR that is commonly evaluated as the most attractive.

A method initially used by Singh (1993) in order to investigate the WHR preference was to ask participants to rate **line drawings bodies** in terms of physical attractiveness, from 1 (most attractive) to 12 (least attractive). Stimuli consisted of bodies categorized according to three levels of BMI (underweight vs. normal vs. overweight) and four levels of WHR (0.7 vs. 0.8 vs. 0.9 vs. 1.0) for each body weight by changing waist size only. Results revealed that men considered a WHR of **0.7** among the normal weight group as the most attractive, the most healthy and the youngest, followed by the 0.8, the 0.9 and finally the 1.0 (Singh, 1993). According to Singh (2002), the male evaluation of female physical attractiveness can be modified simply by changing the WHR size, since even a small change will affect their judgment.

With the same material, Henss (1995) found that a WHR of **0.8** was rated as the most attractive, followed by the 0.7, then by the 0.9 and finally by the 1.0. However, post-hoc comparisons showed that WHRs 0.7, 0.8 and 0.9 were not significantly different in terms of their attractiveness rating. Several years later, Henss (2000) tried to replicate these results with photographs of female bodies (in bathing suit seen from front) in order to use more naturalistic stimuli than line drawings bodies. This study showed that a **lower WHR** was preferred to a higher WHR.

Results found by Furnham, Petrides and Constantinides (2005) are consistent with Singh's finding (1993) since they also showed that a WHR of **0.7** of average weight line drawings bodies was considered the most attractive and healthy, whereas a WHR of 1.1 was considered the least attractive. Similarly, Singh and Young (1995), using eight line drawings bodies presented on a sheet, found that a WHR of **0.7** was the most attractive. Consequently, it seems that a **low WHR** (i.e., 0.7) is mainly evaluated as the most attractive, although methodological differences exist between studies concerning the stimuli and rating scales used.

2.1.3.1 Cultural influences

Although Singh (1993) argued that men universally prefer women with a low WHR, contrasting results concerning this preference in terms of attractiveness related to different cultures was discussed in many studies. For instance, various studies performed by Dixson and colleagues investigated this variation. First, in the study of Dixson et al. (2010), men from **New Zealand and California** evaluated the attractiveness of female photographs seen from the back, whose WHR varied from 0.5 to 1.0. Participants had to choose the picture that they found as the most sexually attractive. The WHR **0.7** (i.e., medium size) was evaluated as the most attractive in New Zealand and the WHR **0.6** (i.e., small size) as the most attractive in California. Moreover, these authors found an **absence of selection of the WHRs 0.9 and 1.0** in both countries. Consequently, this study showed a significant association between culture and the WHR preference. The latter was also investigated in **Chinese** men in the study of Dixson et al. (2007a) in which the experimental design was the same as for Dixson et al. (2010). In this country, the WHR of **0.6** was the most attractive ratio for Chinese men. This WHR of 0.6 was followed by the WHR 0.7, whereas higher ratios (i.e., 0.9 and 1.0) were significantly less attractive. These results are consistent with the most attractive WHR of 0.6 found in the California study (Dixson et al., 2010). Identically, **British** and **Japanese** men also showed a preference for real women photographs in front view with a **low WHR** (Swami, Caprario, Tovée & Furnham, 2006b). Consequently, in these industrialized societies, the WHR preference seems to be for low WHRs (i.e., 0.6 or 0.7).

It is also interesting to investigate the WHR preference in some cultures that are least influenced by the media, as this could modify the female attractiveness rating. For instance, Dixson, Dixson, Morgan and Anderson (2007b), using the same method previously used by Dixson et al. (2007a, 2010), highlighted that **Cameroun** men preferred woman pictures seen from back with a WHR of **0.8** (i.e., large size), followed by pictures with a WHR of 0.7 (Dixson et al., 2007b), which differs from results discussed above in the other countries.

Another way to investigate the WHR preference and its divergence among cultures is to study it in remote societies, in tribes that have specific living conditions. For instance, Marlowe and Wetsman (2001) studied the Hadza men in Tanzania, a **tribe oriented to hunting and gathering**. Using drawings of frontal women, they found that the WHR of **0.9** was preferred to lower WHRs, whereas the WHR of 0.7 was evaluated as the most attractive for US men. Consequently, societies oriented toward constant food search, like the Hadza, can affect the body ideal, and cause men to prefer females with a higher WHR, synonymous with an abundance of food, with energy reserves, and so good for the female health and fertility. The WHR preference thus correlated with food resources (Swami, Knight, Tovée, Davies & Furnham, 2007a).

In conclusion, studies discussed above show that preferences for a specific body shape and a unique WHR are culturally influenced, since different WHR preferences across cultures were highlighted. However, taking together, these studies show that it is mainly the WHRs of **0.6** and **0.7** that seem to be evaluated as most attractive in industrialized societies, along with an absence of selection of the WHRs 0.9 and 1.0, whereas remote societies prefer higher WHRs. But why are there differences in terms of WHR preferences between cultures? Several explanations can be considered.

First, the differences of preference can exist because of **local conditions** related to the specific culture which modulate the perception of body shape, body image and weight.

Indeed, messages provided by the body shape, internalized early in life, are mainly related to the culture (Swami, Neto, Tovée & Furnham, 2007b). Moreover, given that there exists a wide **range of body sizes** across populations, Symons (1995, cited by Singh, 2002) proposed that the WHR preference could be modulated by the female average in a given population by psychological mechanisms that could develop a rule to prefer a WHR lower than the average (Henss, 2000; Singh, 2002). In the same way, it was also argued that the WHR preference corresponds to the WHR of young women, specific to different populations (Marlowe, Apicella & Reed, 2005). Finally, the **Western media**, conveying an ever-thinner ideal, can also have an influence (Singh, 2002). An interesting result was found by Yu and Shepard (1998) who investigated the Matsigenka, a tribe that was not under the Western media pressure since they lived in a reservation in Peru. Using line drawing bodies seen from front, they showed that men in this tribe preferred higher WHRs in terms of attractiveness. However, an interesting result is that the exposure to tourists changed the preference; Matsigenka men who live outside the reservation, in an area exposed to tourists for only 30 years, changed to prefer a low WHR, as though the ideal of beauty was then modified by the outside influence and the degree of acculturation. Along the same lines, the body ideal in some remote cultures, away from wider societal norms, and with specific living conditions, seems different from the global cultures, as showed in Hadza of Tanzania (Marlowe & Wetsman, 2001).

2.1.3.2 Influence of the type of relationships

Another influence on the WHR preference is the mating strategy of the viewer. Swami et al. (2008) presented real women seen from front for evaluation to unrestricted men (mainly engaged in short-term relationships) and to restricted men (mainly engaged in long-term relationships). Results showed a higher preference for a **low WHR** in the **unrestricted** group as compared to the restricted group, suggesting that the physical attractiveness is more important for a short-term than for a long-term relationship, in which people prioritized interpersonal aspects (Swami et al., 2008) with the action of a more restrictive personality filter (Singh, 2002, cited by Furnham et al., 2004). These results can be explained with evolutionary theory in the sense that being in a short-term relationship increases men's reproduction potential, so they emphasized salient features signaling a woman's reproductive success, such as a low WHR, which is not associated with pregnancies (Swami et al., 2008).

With the same goal, but including participants of both genders, Currie and Little (2009) asked the participants to rate the attractiveness of opposite sex images either for a short relationship (e.g., single date) or long-term relationship (e.g., to live with or get married to). Interestingly, no difference was found in the female group between the two types of relationships in terms of attractiveness rating, whereas there was a difference in the male group, suggesting that the criteria of attractiveness in women are independent of the type of relationships, which is not true in men.

2.1.3.3 Observer's gender influence

The gender difference in the type of relationship raises the question of the gender influence on the physical attractiveness rating. For Cornelissen et al. (2009), a **similarity** exists in the behavioral results between **males and females** in terms of their evaluation of the physical attractiveness. This is in line with the research of Tovée and Cornelissen (2001) who found that female and male participants identically rated real female pictures in front and side views, both preferring a **low WHR** and thus showing a shared perception of female physical attractiveness. These results are predicted by the mate selection theory, which postulates that a person must be able to evaluate not only the opposite-sex partner attractiveness, but also to know their own attractiveness relative to others members of the same sex. Being aware of her own attractiveness allows a woman to focus on an opposite sex partner of the same level of attractiveness, instead of losing time and resources on the courtship of a more attractive partner (Cornelissen et al., 2009; Fan, Dai, Qian, Chau & Liu, 2007).

2.1.4 Evolutionary explanations

After describing different characteristics of the physical attractiveness, especially the WHR, we can now ask ourselves: how is it that some WHRs are more pleasing to people than other ratios?

An answer to this question can be sketched by analyzing the writings of Charles Darwin (1808-1882). He introduced **natural selection** as one of the mechanisms of evolution, which attributes the survival of the fittest to the conservation of beneficial individual variations and to the elimination of harmful variations (Darwin, 1921). Thus, natural selection implies the preservation of accidental variations only when they are beneficial to the individual in the local living conditions. According to Darwin, people can neither produce nor prevent variations of traits; they can only preserve and accumulate those that appear (Darwin, 1921).

Another form of selection highlighted by Darwin is **sexual selection**, which interests us particularly in the field of physical attractiveness. It concerns the evolution of features that increase the mating success via partner attraction (**intersexual selection**) or rival intimidation (**intrasexual selection**) (Barber, 1995). In many animals, sexual selection helps natural selection by assuring the most vigorous males the largest number of descendents. This selection depends on the struggle between individuals of the same sex, generally males, to ensure the ownership of the other sex, usually females, and concludes with a smaller number of descendants for the losers (Darwin, 1921). According to Darwin, whenever males and females of any species have the same general habits, but differ in terms of color, ornamentation or conformation, these differences are mainly due to sexual selection (Darwin, 1921). Physical preferences and morphological traits are modified by sexual selection (Darwin, 1871, cited by Furnham et al., 2004), and more specifically by intersexual and intrasexual selections.

In the case of the WHR, it seems to have been mainly enhanced by intersexual selection for mate attraction (Barber, 1995). Understanding the WHR preference thus raises two questions: first, how can a female advertise some of her qualities to a potential partner, and secondly, how can a male evaluate the female's reproductive value using the bodily cues (Barber, 1995). On one hand, **females** compete among themselves to attract male partners of high quality by announcing their reproductive potential with morphologic characteristics like fat distribution, a reliable cue of reproductive success as previously discussed (Barber, 1995). These characteristics signal to the potential partner their higher "desirability" (Buss, 1999, cited by Swami et al., 2006a). In this context, the attractiveness of these morphological traits was accentuated (Buss, 1999, cited by Swami et al., 2006b). On the other hand, it is essential for a **male** to pay close attention and to use female morphological cues that are reliable indicators of their reproductive success (Tovée & Cornelissen, 2001). Indeed, selection developed psychological mechanisms in men to be sensitive to female bodily features in the evaluation of their partner quality, since the indication conveyed by some of these features were reliable for the reproductive success level (Singh, 2002). Men attracted by women with a **low WHR** will by consequence have higher reproductive success; this partner preference would be encouraged by natural selection. This preference thus seems to be explained by the **good genes approach** - attractive secondary sexual characteristics, like the WHR, are related to good health (Barber, 1995).

In conclusion, after having described divergent WHR preferences across cultures, we presented the evolutionary view, which argues an innate low WHR preference. At first glance, these two perspectives seem to show divergent results, but they are in fact reconcilable. Indeed, different WHR preferences across cultures may result from a dynamic adaptation to the specific living conditions in a given culture, although the underlying cognitive mechanism is initially similar (Swami et al., 2007b). Besides, Darwin mentioned the topic of the migration of individuals of a species who frequently undergo later modifications and refinements due to new conditions (Darwin, 1921).

2.2 Visual perception of human bodies

After describing the characteristics of physical attractiveness at a behavioral level, it is now interesting to explore the topic of **body perception** at the cerebral level to see whether there is a specific cerebral signature of perceived human bodies compared to faces and others visual objects. To this end, body-selective brain areas will be first exposed followed by the time-course of body processing investigated with surface and intracranial electroencephalogram studies. Finally, we present some results concerning brain areas involved in perceived sexual stimuli and the time course associated with these stimuli.

The study of body shape perception has recently become a **new area of interest** in neuroscience. Indeed, most studies of visual perception were so far extensively focused on the perception and processing of faces, perhaps because faces convey essential cues concerning identity, emotional feelings, and social intentions of interlocutors (Van de Riet, Grèzes & De Gelder, 2009). Therefore, some interesting discoveries concerning **face-processing mechanisms** were made. For instance, it is now accepted that the fusiform face area (**FFA**), in the fusiform gyrus, is more activated by faces than by other objects and is involved in the integration of face parts (Taylor et al., 2007, cited by Hodzic, Muckli, Singer & Stirn, 2009) and in the discrimination of face identity (Loffler et al., 2005, cited by Hodzic et al., 2009). In addition, the occipital face area (**OFA**), reactive to physical features of faces, and the superior temporal sulcus (**STS**), sensitive to dynamic features of facial information (e.g., expression), are also face-selective areas (Kanwisher et al., 1997, cited by Minnebusch & Daum, 2009). Moreover, it was found that faces elicit a negative component peaking at 170 ms after the stimulus onset, named the **N170** (Thierry et al., 2006).

Like faces, **human bodies** are an essential element in our visual field. They allow us to identify a human being from a distance, even if we do not see the face, thanks to the specific body scheme - bipedalism and the number of body parts - (Gliga & Dehaene-Lambertz, 2005). Moreover, they convey informative cues to help recognize people and to identify their gender, age, emotional states and social interactions (Gliga & Dehaene-Lambertz, 2005; Minnebusch & Daum, 2009). In addition to these **roles**, as discussed above, the body is a crucial element in the judgment of beauty and attractiveness, the roles that specially interest us in this work, and can also be an object of sexual desire.

However, in contrast to the burgeoning knowledge about faces, the field of body processing still needs to be investigated in more detail. Currently, researchers are asking the same questions about body perception that they have asked for the past 30 years in faces studies (De Gelder et al., 2010), i.e. which brain regions are involved in body processing, and what is the time course of this processing. Below, we will describe the main results concerning these topics, with evidence from neuroimaging and neurophysiology.

2.2.1 Neural representation: body-selective brain areas

As with face-selective areas, two brain regions that selectively respond to **static** images of the human body have been identified in human visual cortex by the neuroimaging studies: the extrastriate body area (EBA) and the fusiform body area (FBA) (see figure 1). These regions suggest that the human body, like the face, is a special perceptual category involving a specific cortical network (Minnebusch & Daum, 2009; Van de Riet et al., 2009).

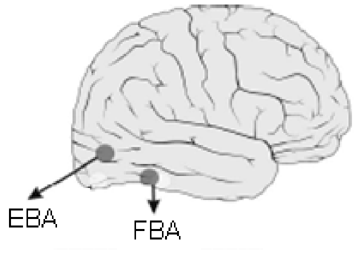

Figure 1. Body-selective regions: the extrastriate body area (EBA) and the fusiform body area (FBA).

The first brain area, the **EBA**, is localized at the posterior end of the inferior temporal sulcus, in the right **lateral occipito-temporal cortex**, and has the largest response to pictures of static human bodies and body parts, relative to faces, immobile objects and object parts (Downing, Jiang, Shuman & Kanwisher, 2001). This region is involved in the processing of the visual appearance of human bodies and may be useful to **identify** a stimulus as a **human body** and to perceive the position and configuration of the other bodies (Downing et al., 2001). Moreover, this region may contain an **abstract representation** of bodies since it also responds to human silhouettes and stick figures (Minnebusch & Daum, 2009). Consequently, the EBA could be required in **body detection** rather than in its identification (Minnebusch & Daum, 2009), which is consistent with the finding of Hodzic et al. (2009) that this area is neither implied in extracting information about body identity nor in the detection of the self, since no activity related to self was found in this region.

The second body-selective region is the **FBA**, situated in the **posterior fusiform gyrus**, very close to the FFA. Besides, the spatial proximity between the FBA and the FFA in the fusiform gyrus was explored in studies using higher-resolution technique of fMRI, which highlighted that these two areas are in fact distinctly separated although adjacent (Schwarzlose, Baker & Kanwisher, 2005) and not relatively overlapped as was found in studies using standard fMRI scanning resolution (Peelen & Downing, 2005, cited by Schwarzlose et al., 2005). The FBA may be involved in the identification and discrimination of **body identity** and in the **integration of the body parts** (Taylor et al., 2007, cited by Hodzic et al., 2009).

2.2.2 Time course of body processing

The body-selective areas in the human visual cortex were discussed above. However, there remains the question of when the body-selective responses appear in these specific regions. The electroencephalogram (**EEG**) allows an answer to this question by investigating the time-course of body processing with a very high temporal resolution by analyzing time-resolution information millisecond by millisecond (Ortigue, Patel & Bianchi-Demicheli, 2009). In this context, event-related potentials (**ERPs**), as electrical potentials in response to specific event (e.g., a viewed visual stimulus), can bring relevant information by the analysis of their positive (P) and negative (N) deflections, named components. P1, N1, P2, N2 and P3 are the main visual ERPs components, the numbers designating the temporal position in the waveform (Ortigue et al., 2009).

2.2.2.1 Event related potentials in research of body perception

Studies have recently investigated the time course of perceived human bodies, but often in direct comparison with faces processing. A lot of studies have focused on the **N170**, a so-called face-specific component, which is a negative brain potential from 140 to 200 ms peaking at around 170 ms after the stimulus presentation in the **lateral occipito-temporal** areas (Gliga & Dehaene-Lambertz, 2005; Kovacs et al., 2006; Stekelenburg & De Gelder, 2004), in order to discover if there exists a similar waveform for bodies, since some similarity seems occur between face-selective areas and the body-selective ones (Kovacs et al., 2006).

For instance, a study of Stekelenburg and De Gelder (2004) comparing upright and inverted bodies (with masked faces) and faces investigated whether the human body will also elicit this **N170.** A negative deflection was found with peak latency at **157 ms** after presentation of **upright bodies**, at 167 ms after upright faces and at 182 ms for objects. Interestingly, Stekelenburg and De Gelder (2004) also found an **effect of inverted bodies** on the N170 as was also found with inverted faces, but not with inverted objects: the identification of bodies was impaired when presented inverted, in the sense that the N170 amplitude was larger and its latency longer for these stimuli as compared to the upright bodies. This body-inversion effect suggests that human bodies, like faces, are processed by a **configural processing**, involving the perception of relations between features of the stimulus (Minnebusch & Daum, 2009; Stekelenburg & De Gelder, 2004). Indeed, like faces, all bodies have an identical configuration and the same hierarchical structure. This configuration allows us to identify the stimulus as a body and is involved in body detection (Minnebusch & Daum, 2009). Thus, according to Stekelenburg and De Gelder (2004), the N170, modulated by inversion, is a sign of structural processing both in faces and body perception and may represent one of the first stages in body processing, by detecting the standard hierarchy of body scheme - a trunk, two legs down, two arms up and a head above - (Gliga & Dehaene-Lambertz, 2005). Also in link with inverted body stimuli, Righart and De Gelder (2007) investigated the **P1** component, a positive deflection. However, **no inversion effect** was found for this component since the P1 latency was peaking at 105 ms for upright bodies as well as for inverted bodies. On the contrary, they found an inversion effect for

N170 like in other studies discussed above: a longer latency was found for inverted bodies (164 ms) as compared to upright bodies (155 ms).

Aiming to describe the electrophysiological response of perceived human bodies, Thierry et al. (2006) made an interesting finding concerning a body-selective response. Indeed, in this ERPs study, a negative deflection, termed the **N190**, was discovered with peak latency at 190 ms after the presentation of photographs of clothed headless human bodies and was maximal at the **occipito-parietal** electrode P8. Furthermore, the N190 may also be extended to **schematic representation of the form** of body by extracting the abstract features necessary for its categorization. Indeed, intact body silhouettes and intact stick figures also elicited a negative peak at 185 ms and 193 ms, respectively, and both elicited greater N190 amplitudes than their scrambled homologues. Finally, these authors showed that human bodies are characterized by a **distinct topography map** between **130 and 230 ms** (Thierry et al., 2006). Thus, the N190 is an electrophysiological cue of the analysis of the body form and it contrasts with the N170 elicited by faces peaking at 174 ms in their study, showing that categories of stimulus - face or body - have an impact on the N1 latency. According to Thierry et al. (2006), the N190 elicited by bodies and the N170 elicited by faces are quite identical, but the first one is distinguished by its smaller amplitude, its later latency and its specific spatial disposition. Finally, the N1s elicited by both body and face were greater than the N1s for objects and scenes (Thierry et al., 2006).

In addition to the N190, Thierry et al. (2006) also investigated the **P1** component, finding its peak at **134 ms** after the presentation of body stimuli in the **parieto-occipital** sites (Thierry et al., 2006). More specifically, P1 was significantly earlier for faces (131 ms) and for bodies (134 ms) as compared to objects (137 ms). This P1 latency is consistent with other studies that found it between **100 and 150 ms** after stimulus presentation and coming from **occipital** areas (Arroyo et al., 1997, cited by Gliga & Dehaene-Lambertz, 2005). This component reflects the encoding of low-level visual features (Allison et al., 1999, cited by Gliga & Dehaene-Lambertz, 2005).

An interesting point to note concerning the N1 investigated in studies discussed above is the different relationships between the latency of N1 for bodies compared to faces. Indeed, the first study of Stekelenburg & De Gelder (2004), presenting human bodies with **masked faces**, demonstrated that N170 latency elicited by bodies (**157 ms**) was faster than by faces (167 ms), whereas, in the second study of Thierry et al. (2006), presenting **headless** bodies, the N1 elicited by bodies (**190 ms**) was longer than by faces (174 ms), as though the presence or absence of heads modulated the N1 elicited by bodies (De Gelder et al., 2010).

Results discussed above were obtained with non-invasive electrophysiological recordings, but information concerning the time-course of body-selective processing also comes from studies using **intracranial EEG** recordings. For instance, Pourtois, Peelen, Spinelli, Seeck and Vuilleumier (2007) found, in an epileptic patient who had to categorize stimuli among static images of headless bodies, faces, tools and animals, that the body-selective activity begins at around **190 ms** with its maximum peak at 260 ms after the stimulus onset. This result confirms the presence of an early perceptual processing of human body shapes in a region that corresponds to the **EBA** (Pourtois et al., 2007). Moreover, this result concerning the time-course of the neural responses of human body is consistent with the finding of Thierry et al. (2006) concerning the N190. Consequently, the EBA could be the origin of the N190 elicited by body stimuli, and is thus implicated in an early analysis of body shapes (Pourtois et al., 2007).

To summarize, the time course of body and face perception differs from the time course of object perception, in the sense that the components N170/N190 and P1 are significantly greater for these first stimuli, biologically relevant, than for objects (Minnebusch & Daum, 2009). In the same way, body and face processing also differ from each other. Human bodies can be processed at a very early visual stage, as demonstrated by the N190 with a surface EEG (190 ms in the parieto-occipital area: Thierry et al., 2006) and also with an intracranial EEG (Pourtois et al., 2007). Additionally, Stekelenburg and De Gelder (2004) found a peak at 157 ms after body stimulus onset. Taken together, the studies described above show that human bodies elicit a **N1** component in occipito-parietal areas with mean peak latency between **154 and 228 ms** after the presentation of the body stimulus (De Gelder et al., 2010). Similarly, the **P1** is also related to human bodies, peaking at **134 ms** after stimulus onset in parieto-occipital sites (Thierry et al., 2006).

2.2.2.2 Event related potentials in research of sexual body stimuli

Since our research will be focused on physical attractiveness including among others presentation of **sexual stimuli** - **nude women** -, we will present the results of some studies that have investigated cerebral areas and the time course associated with viewed sexual stimuli and with sexual desire, happening when sexual thoughts are amplified by fantasy or by sexual stimuli (Ortigue & Bianchi-Demicheli, 2008). Although sexual desire is, from an evolutionary perspective, a prerequisite to the mate selection, to the courtship behavior, the reproduction and ultimately to the survival of the species (Buss, 2003, cited by Ortigue & Bianchi-Demicheli, 2008), only a few studies so far have investigated the time course of sexual stimuli processing.

In this context, Costa, Braun and Birbaumer (2003) found two early components using a magnetic field recorded by MEG. The first component peaked at **126 ms** and the second at 203 ms after sexual stimulus onset - young male **nudes** and female nudes in front view - as compared to neutral objects (Costa et al., 2003). In this study, the first component interestingly revealed a **gender difference**: (1) male participants had a greater evoked magnetic activity as compared to female participants, (2) the difference of activity between nudes and neutral objects was only significant for male participants and finally (3) in female participants, the activity which occurred when viewing female and male nudes is not significantly different. This gender difference when viewing sexual stimuli, which have a great biological importance, could be linked with the **evolutionary theory** of **sexual selection** previously discussed (Buss, 1989; Symons, 1979, cited by Costa et al., 2003). In this context, Symons (1979, cited by Costa et al., 2003) described a mate preference evolutionary theory in which distinctive parental investments could explain the gender divergence, for instance, in our case, the different activity between genders elicited by nude stimuli as found by Costa et al. (2003). Men, because of their high reproductive potential as compared to women, are more sensitive to the physical appearance and attractiveness when choosing a partner, whereas women seem to search for more socio-cultural traits in the mate choice, such as security and social status (Symons, 1979, cited by Costa et al., 2003). Consequently, according to Costa et al. (2003, p.143), this early component they found "may reflect the more **prepared evolutionary relevant analysis**".

These results highlighted by Costa et al. (2003) concerning the time course of sexual stimuli converge with those found later by Ortigue and Bianchi-Demicheli (2008), who presented subjects with low and high desirability stimuli that they had to rate in terms of sexual desirability. Desired stimuli represented photographs of young persons in **bathing suit** in front view with the head. In this study, desired stimuli were processed in a different way from non-desired stimuli between **142 and 187 ms**. Consequently, the coding of such desired stimuli seems to happen very early, already in the first 187 ms after the stimulus presentation (Ortigue & Bianchi-Demicheli, 2008). These authors also noticed an interesting behavioral divergence in the response speed between both categories of stimuli: sexually desired bodies were examined longer by subjects, since subjects presented longer reaction times when viewing sexually desirable bodies compared to non-desired ones. Furthermore, concerning the brain areas involved in these categories of stimuli, although both desired and non-desired stimuli recruited the right occipito-temporal region (including the EBA), additional regions were recruited for desired stimuli, this latter involving the posterior superior temporal sulcus (STS) and the temporo-parietal junction (TPJ). Concerning the STS and the TPJ specifically recruited when viewing desired stimuli, an interesting point is that these regions are found to be implicated in social cognition (Saxe and Kanwisher, 2003, cited by Ortigue & Bianchi-Demicheli, 2008), attention (Mouras et al., 2003, cited by Ortigue & Bianchi-Demicheli, 2008), self representation and integration of body-related information (Lou et al., 2004, cited by Ortigue & Bianchi-Demicheli, 2008).

To summarize, sexual and desired stimuli have been found to be processed at an early visual stage, within the first 200 ms, which seems to be an evolutionary “prepared” mechanism (Costa et al., 2003). Besides, even when seen unconsciously, pictures of male and female nudes attract the spatial attention of observers (Jiang, Costello, Fang, Huang & He, 2006), supporting the fact that this kind of stimuli is critical for the **survival of our species** (Redouté et al., 2000). Moreover, some areas involved in the reward mechanism are also activated when sexual stimuli are presented. For instance, Platek and Singh (2010) interestingly found that men showed cerebral activation in areas involved in reward processing (e.g., anterior paracingulate gyrus, nucleus accumbens) specifically when viewing naked female bodies with the optimal ratio (i.e., WHR of 0.7). It thus seems that brain systems in which sexual and attractiveness behaviors and reward systems were linked have emerged via **natural selection**, given that this association enhances the capacity to have descendants (Redouté et al., 2000).

2.3 Questions for research

Collectively, studies discussed in the theoretical framework investigated among others the divergence of WHR preferences between various cultures and, at a cerebral level, brain areas and the processing of human bodies often in relation with face processing, body motions or body expressions and sexual desire. However, to the best of our knowledge, no study has investigated the characteristics of the physical attractiveness in heterosexual women and men observers at behavioral and electrophysiological levels using realistic female bodies. This experiment is thus an exploratory study of the field.

The purpose of this study is first, with a behavioral experiment, to investigate the characteristics of physical attractiveness of naked and dressed realistic female bodies, presented in different WHRs usually used in the literature (0.6, 0.7, 0.8 and 0.9) and from two different perspectives (back and front) in heterosexual observers of both genders, and, secondly, to investigate the time course of cerebral activation for all these categories of biologically relevant sexual stimuli with an electrophysiological experiment. This last goal will allow us to explore the underlying cognitive and physiological mechanism and to examine the electrophysiological indices involved in the cognitive processing of female bodies.

Our research question is the following: Which conditions (female bodies with a WHR of 0.6, 0.7, 0.8 or 0.9, dressed or naked, seen from front or from back) are evaluated as most physically attractive at the behavioral level and how these conditions modulate the brain activity at the cerebral level? **Our conceptual hypothesis** is that stimuli evaluated as more physically attractive in a behavioral experiment should modulate participants’ cerebral activity.

We can now present **the originality of our study**. First of all, as we shall discuss in the Method section below, the stimuli used for our experiments were not photographs or line drawings female bodies like other studies, but realistic stimuli which we created with computer software, thus allowing us to easily manipulate all experimental conditions (WHR, clothes and perspective). Moreover, both genders participated to this study, which allows us to determine whether there exist discrepancies in the evaluation of the attractiveness of female bodies, whereas in a lot of studies, only male participants are included (e.g., Furnham et al., 2005; Singh & Young, 1995; Swami et al., 2008). To validate our research, we proceeded with **two different but complementary experiments**, one evaluating the judgment of physical attractiveness at a behavioral level by asking the participants to rate the level of attractiveness of realistic female bodies and the other one investigating the brain activation associated with the stimuli that participants see scrolling on a screen.

Thus, this study can yield important results for the relevant characteristics of perceived sexual attractiveness of realistic female bodies, and for the time course of the visual processing of these female bodies by observing if an electric activity such as the N190 component is modulated by sexual stimuli which are biologically relevant for humans and how this component is modulated by the various conditions of female bodies. Such electrical modulation could then be a way to indicate important information concerning the fertility and health of women, since the literature describes that factors of attractiveness indicate traits that influence reproductive success.

3. Behavioral experiment

In this section the personal characteristics of the participants will be first outlined, followed by the method. This latter comprises a description of how the material used during the experiment was conceived and developed, followed by an explanation of the experimental procedure itself. Finally, the results of the rating task will be presented and discussed.

3.1 Method

3.1.1 Population

Forty healthy adult volunteers (**20 men** and **20 women**) participated in this first behavioral experiment which is an attractiveness rating task. Both men and women were recruited because it was of interest to the researcher to ascertain whether there is a discrepancy between genders with respect to the evaluation of the attractiveness of female bodies. Subjects were recruited from among our friends, family members and opportunistically from students at the University of Geneva. The mean age of the participants is 27.97 years (SD = 7.76, range = 19-60, see appendix I). Participants are predominantly right-handed (right-handed *n* = 36; left-handed *n* = 2; ambidextrous *n* = 2), with normal or corrected-to-normal vision. In this instance participants were not remunerated, nor were informed of the aims of the study.

Given that this was a study about the perception of human bodies, the main criterion for inclusion related to the **sexual orientation** of participants: specifically subjects were required to be heterosexual and not homosexual or bisexual. Consequently, when asked about their sexual identity, all the participants in the study (*n* = 40) stated that they were heterosexual. More specifically, the majority of participants (*n*= 36) stated that their sexual feelings were exclusively heterosexual and only 4 participants stated that they were predominantly heterosexual and only occasionally homosexual. Indeed none of the participants had had same-sex sexual partners during their lifetime. Overall participants had had between zero and fifty opposite-sex sexual partners in their entire lifetime: however, the majority have had between two and ten opposite-sex sexual partners (no opposite-sex sexual partner *n*= 5; one opposite-sex sexual partner *n*= 5; two *n* = 9; between three and five *n*= 6; between six and ten *n*= 7; between eleven and twenty *n*= 4; between twenty-one and fifty *n*= 1; 3 participants declined to provide these details).

A further criterion was that participants should not present signs of being overweight or underweight. Indeed, **weight** issues could influence the perception of bodies; for instance, women suffering from anorexia, suffering from a distortion of the physical image, show significant differences in their evaluation of the attractiveness of other women bodies (Cornelissen et al., 2009). Thus, in this experiment, most participants were of average weight and did not suffer from eating disorders.

3.1.2 Material

The behavioral experiment consisted of a computerized attractiveness rating task in which participants had to rate the attractiveness of **192 colored pictures of realistic female bodies** (see appendix II). In this section, we will explain how the stimuli were created and the precise aim of this task will be explained in following section under the heading "Experimental procedure".

An important aspect of this material is that stimuli used were realistic rather than real bodies. More specifically, the photographs of women's bodies featured in previous studies were not used (e.g., Currie & Little, 2009; Swami et al., 2007b; Tovée & Cornelissen, 2001). Instead realistic female bodies were specially created using Quidam 3.1.5 software (N-Sided). This software allowed us to create realistic bodies by changing size, skin color, hair color and type. It also enabled us to modify from which point of view the bodies were observed, and to add or remove clothes, manipulations which would have been more difficult had photographs of real women been featured. Moreover, the faces were blurred so the facial attractiveness would not be a factor in participants' ratings (Gliga & Dehaene-Lambertz, 2005; Tovée & Cornelissen, 2001). Thus, with the aid to this software, 192 stimuli of realistic female bodies were created. Indeed, colored pictures of **12 different realistic models** were created under different categories and conditions:

- **Perspective**: front (f) and back (b) views;
- **Clothes**: dressed (d) and naked (n) bodies;
- **WHR**: 4 different sizes/ratios:
    - Small (WHR of 0.6);
    - Medium (WHR of 0.7);
    - Large (WHR of 0.8);
    - Extra large (WHR of 0.9).

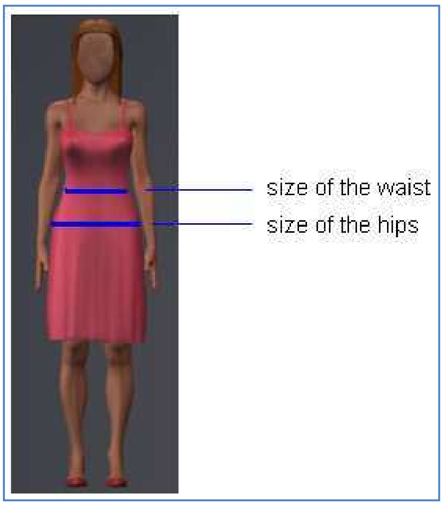

Figure 2. Concrete example of the localization of the waist and the hips that we measured to calculate the WHR of each female body.

Concretely, to calculate the different WHRs, the size of the waist and the size of the hips were measured (in centimeters) and then the ratio was calculated by dividing the waist size by the hips size (see figure 2). All the realistic female bodies (see figure 3) were static and had a BMI with an average weight, neither underweight, nor overweight. Each stimulus was centered on a grey square measuring 17 cm x 6 cm. This rating task was administered on a laptop with a screen resolution of 1024 x 768 pixels and was run by E-prime computer software.

To summarize (see figure 4), the stimuli of realistic female bodies could be presented from the front or from the back, either naked or clothed and depicting 4 different WHRs (0.6, 0.7, 0.8 and 0.9). Consequently, there were 16 conditions (2 clothes x 2 perspectives x 4 WHRs) and each condition comprised 12 stimuli, making a total of 192 stimuli.

0.6 (small) 0.7 (medium) 0.8 (large) 0.9 (extralarge)

Figure 3. Example stimuli. From left to right: small (WHR 0.6) naked front body, medium (WHR 0.7) dressed back body, large (WHR 0.8) dressed front body and extra large (WHR 0.9) naked back body.

Stimuli of realistic female bodies	
WHR	4 WHRs (0.6, 0.7, 0.8, 0.9)
Clothes	2 clothes (naked, dressed)
Perspective	2 perspectives (back, front)
Number of category	16 (4 x 2 x 2)
Number of stimuli	12 per category
Total of stimuli	192 (16 x 12)

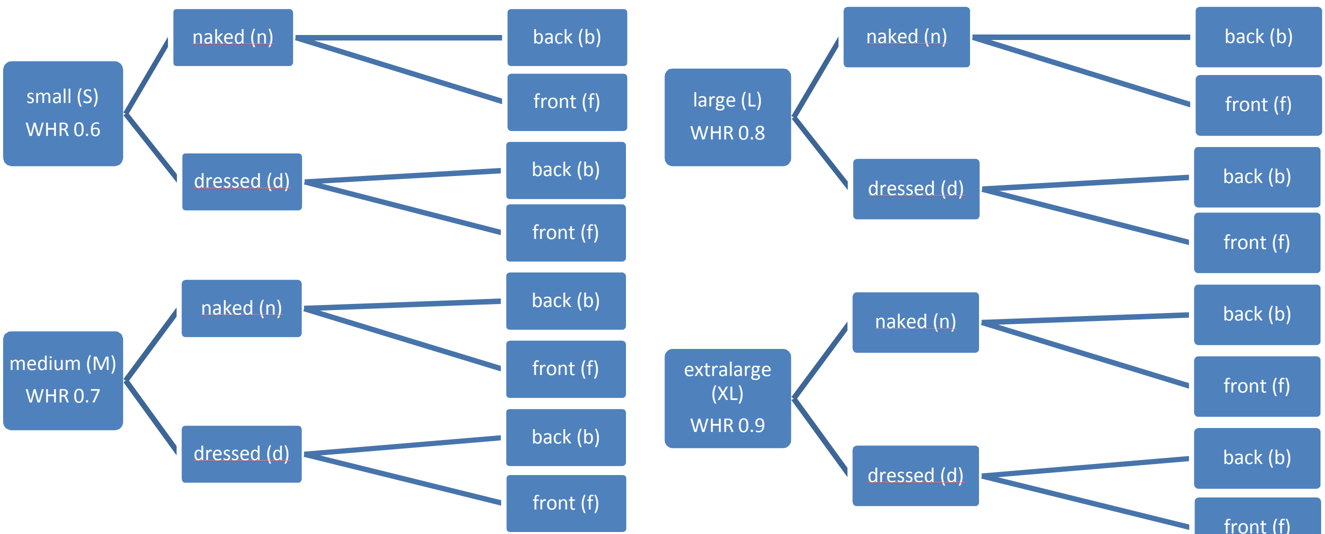

Figure 4. Summary of the 16 conditions of the stimuli.

In addition to the computerized task, a questionnaire was used to assess the sexual orientation of participants. Indeed, given that heterosexuality was the main criterion of inclusion, each participant was required to complete the **Sexual Orientation Questionnaire** (SOQ; Kinsey, Pomeroy & Martin, 1948; see appendix III). This questionnaire is often used in studies about physical attractiveness (e.g., Jiang et al., 2006; Paul et al., 2008) and evaluates the degree of heterosexuality of participants by asking them to estimate their sexual feelings, the number of opposite or/and same sexual partners and their sexual identity with a 7 point Kinsey Scale.

3.1.3 Experimental procedure

The location in which the experiment was carried out was quiet to avoid any distractions. It was important that participants felt that their privacy was respected, that no one else was present to influence their rating and to avoid any feelings of embarrassment resulting from viewing images of naked females on the computer screen. Subjects were tested **individually** and the experiment required the presence of only one single experimenter for each participant. The duration of the task depended on the subject's speed to estimate the physical attractiveness of the 192 stimuli, but generally lasted between **15 and 20 minutes**.

Having filled the **SOQ**, participants were placed in front of the **computer screen** to start the rating task. Each participant was invited to familiarize themselves with the computerized task by reading the **instructions** (see appendix IV) written on the screen in French. Participants have to **rate the attractiveness of the 192 pictures of women's bodies** on a continuous analogical scale represented by a horizontal line that appeared under the stimulus on the screen (see figure 5). The stimuli are presented in a random order in the centre of the screen. Participants indicated the degree of attractiveness of every picture by placing the mouse of the desired point of the horizontal line, from 0 (unattractive) to 100 (extremely attractive). A red line indicates the localization of the mouse on the horizontal line. Following the instructions, an example - photograph of Bill Clinton - was presented to ensure that the participant had fully understood and to provide an opportunity to use the rating scale. Then, they had to rate the attractiveness of the 192 pictures of women's bodies.

The **three independent variables** (IV) are the perspective (front vs. back) of the female bodies, the clothes (dressed vs. naked) and the WHR (0.6, 0.7, 0.8 and 0.9).The **dependent variable** (DV) is the rate of the attractiveness of the stimuli, from 0 to 100.

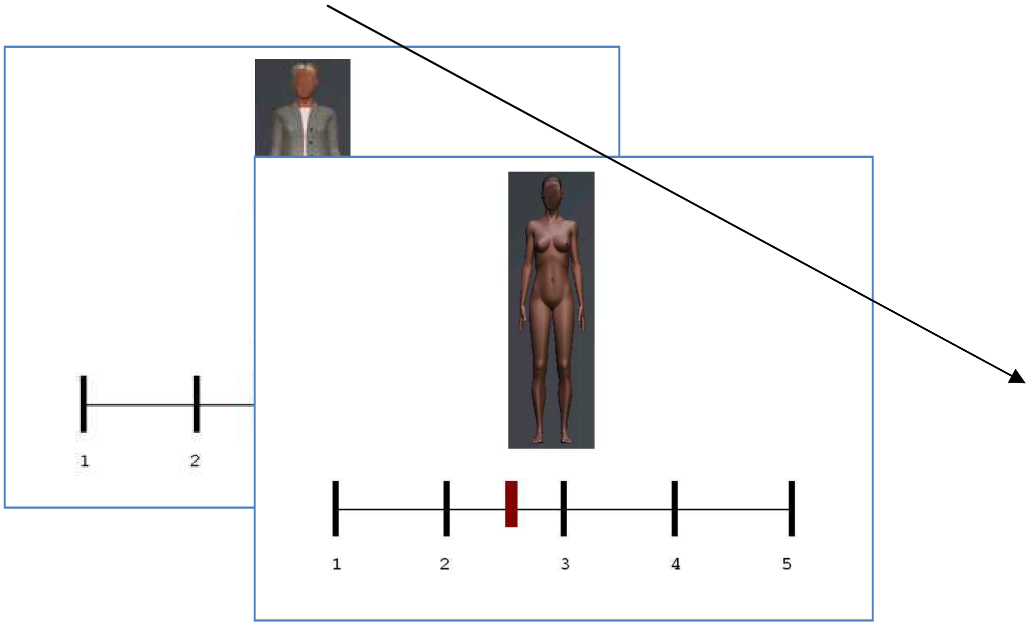

Figure 5. Experimental design of the rating task.

3.1.4 Operational hypotheses

Since it is over all an **exploratory study** and given the lack of study on this topic as explained in the theoretical framework, even if some hypotheses will be postulated below, these are more formulated as objectives, with the aim to explore all main significant results that will be interesting to understand the complexity of the physical attractiveness of women's bodies.

First of all, based on the findings reported about **WHR** studies discussed above (e.g., Dixson et al., 2011; Furnham et al., 2005; Singh, 1993; Swami & Tovée, 2005) and that participants are living in an industrialized society, we may expect that realistic female bodies with a low WHR (i.e., 0.7) will be evaluated as more attractive for heterosexual observers than other WHRs (i.e., 0.6, 0.8 and 0.9) in the rating task, a higher score indicating a better judgment in terms of physical attractiveness.

Moreover, for the **clothes** (naked vs. dressed) and **perspective** (back vs. front) of female bodies, our objective is to investigate which modalities are rated most highly for attractiveness, since there is no study specifically about that.

3.2 Behavioral data analysis

All the behavioral results below were recorded on E-prime software and then were analyzed using Excel and Statistica software. The conditions of the application of ANOVA on our data being respected, a Repeated Measures Analysis of Variance (**ANOVA**) **2 Clothes** (dressed and naked) **x 2 Perspective** (front and back) **x 4 WHR** (0.6, 0.7, 0.8 and 0.9) was performed on these rating means of all participants.

3.3 Behavioral results

In this section, descriptive statistics of the behavioral results of the 16 conditions (2 x 2 x 4) will be first described. Then, the main behavioral results from the ANOVA 2 x 2 x 4 will be presented to see whether our behavioral hypothesis about the WHR of 0.7 is confirmed or not and also to see if there are other interesting results since it is an exploratory study.

3.3.1 Descriptive statistics

Descriptively (see table 1 and appendix V), if we take all the 16 conditions, data for **all participants** shows that **(1)** naked female bodies with a WHR of 0.7 seen from back (*M*=63.64, SD=18.41) are on average stimuli which are evaluated as the most attractive ones by participants, followed by **(2)** naked female bodies with a WHR of 0.7 seen from front (*M*=59.29, SD=19.75). Then, the third combination that is evaluated as most attractive is **(3)** naked female bodies with a WHR of 0.6 seen from back (*M*=54.35, SD=16.13).

If we look more specifically at the evaluation according to **gender**, **male** participants follow this same tendency described above for the order of their three first choices in terms of attractiveness: **(1)** naked female bodies with a WHR of 0.7 seen from back (*M*=67.69, SD=19.77), followed by **(2)** naked female bodies with a WHR of 0.7 seen from front (*M*=61.69, SD=20.79) and by **(3)** naked female bodies with a WHR of 0.6 seen from back (*M*=55.82, SD=18.87).

However, while **female** participants also evaluated the two first conditions **(1)** and **(2)** as most attractive, the evaluation of attractiveness with respect to the third condition differed from that of the male participants. Indeed, the order of the three first choices in terms of physical attractiveness for the female participants is as follow: **(1)** naked female bodies with a WHR of 0.7 seen from back (*M*=67.69, SD=19.77), followed by **(2)** naked female bodies with a WHR of 0.7 seen from front (*M*=61.69, SD=20.79) and finally **(3)** naked female bodies with a WHR of 0.6 seen from front (*M*=52.8985, SD=19.74) and not naked female bodies with a WHR of 0.6 seen from back like for male participants. Nevertheless, the female bodies that are then **(4)** evaluated as most attractive for female participants (naked female bodies with a WHR of 0.6 seen from back: *M*=52.897, SD=13.16) is the same as the **(3)** third choice of male participants and there is a very small difference between both.

Conversely, with respect to the condition of stimuli that is considered the least attractive, **participants** evaluated on average **(16)** naked bodies with a WHR of 0.9 seen from front as the least attractive (*M*=15.88, SD=13.03). Again, if we see the results according to the **gender**, **male** participants (*M*=17.87, SD=16.40), like **female** participants (*M*=13.89, SD=8.46), evaluated those latter bodies as the least attractive.

	Men (*n*= 20)		Women (*n*= 20)		All participants (*n*= 40)	
	Mean	SD	Mean	SD	Mean	SD
d b 0.6	**(8)** 46.43	16.06	**(7)** 45.25	14.16	**(7)** 45.84	14.95
d b 0.7	**(5)** 53.91	20.11	**(5)** 50.38	15.86	**(5)** 52.15	17.97
d b 0.8	**(11)**32.98	12.27	**(10)** 34.08	13.46	**(10)** 33.53	12.73
d b 0.9	**(13)** 28.09	13.20	**(13)** 26.18	9.93	**(13)** 27.13	11.57
d f 0.6	**(7)** 47.04	16.49	**(8)** 43.91	13.83	**(8)** 45.48	15.10
d f 0.7	**(6)** 52.46	15.69	**(6)** 49.72	15.11	**(6)** 51.09	15.27
d f 0.8	**(12)** 32.60	13.52	**(12)** 30.91	12.37	**(12)** 31.75	12.82
d f 0.9	**(14)** 23.66	12.90	**(14)** 19.89	10.40	**(14)** 21.78	11.72
n b 0.6	**(3)** 55.82	18.88	**(4)** 52.89	13.16	**(3)** 54.36	16.13
n b 0.7	**(1) 67.69**	19.77	**(1) 59.60**	16.46	**(1) 63.65**	18.42
n b 0.8	**(10)** 33.53	18.35	**(9)** 34.43	13.19	**(9)** 33.98	15.78
n b 0.9	**(15)** 22.59	16.49	**(15)** 19.67	9.39	**(15)** 21.13	13.33
n f 0.6	**(4)** 55.29	19.45	**(3)**52.89	19.75	**(4)** 54.10	19.38
n f 0.7	**(2)** 61.69	20.79	**(2)** 56.89	18.88	**(2)** 59.29	19.76
n f 0.8	**(9)** 34.05	19.24	**(11)** 31.88	14.39	**(11)** 32.97	16.81
n f 0.9	**(16)** 17.88	16.40	**(16)** 13.89	8.46	**(16)** 15.88	13.04

Table 1. Mean attractiveness rating and standard deviation (SD) of the attractiveness rating for the 16 conditions divided between male and female participants and also for all participants combined. *Notes*. d = dressed; n = naked; f = front; b = back; numbers in parentheses indicate the descending order for the attractiveness rating, from most attractive **(1)** to least attractive **(16)**.

Below (see figure 6), all the means found in table 1 are graphically displayed in order to better realize how are the descriptive data of the rating task.

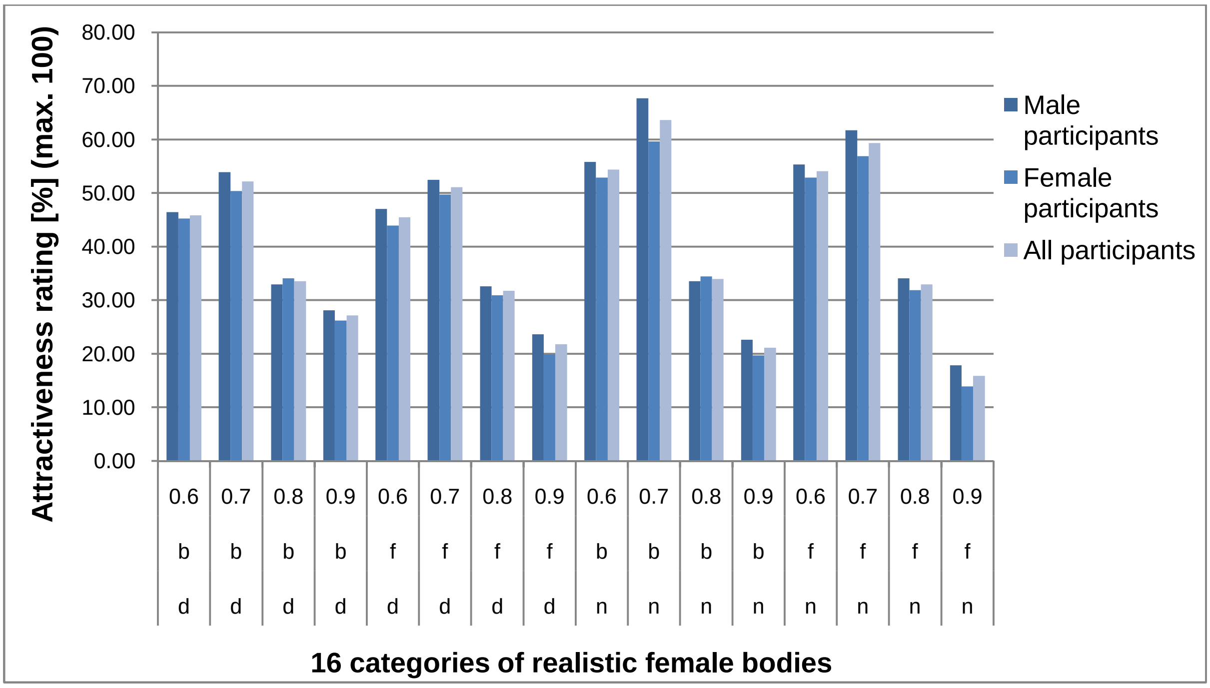

Figure 6. Mean attractiveness rating for each of the 16 conditions of female realistic bodies for male and female participants and for all participants combined. The y-axis represents the attractiveness rating (in [%]) in the rating task and the x-axis the 16 conditions of realistic female bodies in terms of gender and for all participants combined.

3.3.2 Inferential statistics

In this section, the main significant results of the ANOVA **2 x 2 x 4** are presented to reflect the main effects of Clothes, Perspective and WHR and interaction effects between Clothes and WHR and between Perspective and WHR (see table 2). In addition, results related to gender will be also presented, since it is interesting to see whether there was any gender difference in the attractiveness rating.

Effect	SS	Degree of Freedom	MS	F	p
Intercept	1037184	1	1037184	422.7559	0.000000
Gender	1168	1	1168	0.4760	0.494419
Error	93229	38	2453		
Clothes	1770	1	1770	6.4309	0.015448
Clothes x Gender	57	1	57	0.2081	0.650869
Error	10461	38	275		
Perspective	943	1	943	7.3381	0.010067
Perspective x Gender	24	1	24	0.1833	0.670933
Error	4884	38	129		
WHR	122160	3	40720	185.2138	0.000000
WHR x Gender	386	3	129	0.5854	0.625757
Error	25063	114	220		
Clothes x Perspective	13	1	13	0.1028	0.750237
Clothes x Perspective x Gender	19	1	19	0.1440	0.706455
Error	4959	38	131		
Clothes x WHR	6491	3	2164	55.5207	0.000000
Clothes x WHR x Gender	60	3	20	0.5126	0.674403
Error	4443	114	39		
Perspective x WHR	555	3	185	7.0933	0.000206
Perspective x WHR x Gender	131	3	44	1.6747	0.176391
Error	2975	114	26		
Clothes x Perspective x WHR	101	3	34	1.6825	0.174718
Clothes x Perspective x WHR x Gender	14	3	5	0.2307	0.874858
Error	2288	114	20		

Table 2. ANOVA analysis of the rating task. *Note.* Red numbers are those which are significant ($p<.05$).

Gender

According to the ANOVA analysis, there was no main effect of **Gender** ($F(1,38) = 0.47$, $p=.49$, n.s.). More specifically, a Fisher LSD Post hoc Test showed that there was no significant difference between the genders in the attractiveness rating of the 16 conditions of stimuli ($.31 < p < .91$, see table 3). By consequence, the scores of evaluation did not differ significantly on average between both genders.

Clothes	Perspective	WHR	Men (*n* = 20)	Women (*n* = 20)	p
Dressed	Back	0.6	46.43	45.25	0.882863
Dressed	Back	0.7	53.91	50.38	0.658192
Dressed	Back	0.8	32.98	34.08	0.889395
Dressed	Back	0.9	28.09	26.18	0.811028
Dressed	Front	0.6	47.04	43.91	0.695616
Dressed	Front	0.7	52.46	49.72	0.731566
Dressed	Front	0.8	32.6	30.91	0.832167
Dressed	Front	0.9	23.66	19.89	0.637325
Naked	Back	0.6	55.82	52.89	0.714138
Naked	Back	0.7	67.69	59.6	0.313564
Naked	Back	0.8	33.53	34.43	0.909780
Naked	Back	0.9	22.59	19.67	0.714138
Naked	Front	0.6	55.29	52.89	0.763936
Naked	Front	0.7	61.69	56.89	0.548145
Naked	Front	0.8	34.05	31.88	0.784493
Naked	Front	0.9	17.88	13.89	0.618071

Table 3. Fisher LSD Post hoc Test. *Notes.* Error: Between; Within; Pooled MSE = 628.40, df = 39.880.

WHR

According to the ANOVA analysis, a **main effect of WHR** was found (*F*(3, 114)=185.21, *p*=.00): the rates of attractiveness for the different WHRs are significantly different. Including all the participants (*n* = 40), data showed a gradient of attractiveness. The **(1)** medium realistic bodies (WHR of 0.7) had on average the highest rating of attractiveness (*M*=56.54, SE=5.25, see figure 7), which confirms our hypothesis on the WHR of 0.7 as the most attractive WHR. Following the medium realistic bodies, **(2)** the smallest realistic bodies (WHR of 0.6) were evaluated as the second most attractive (*M*=49.94, SE=4.63). Next, **(3)** the large size (WHR of 0.8) (*M*=33.05, SE=4.05) and finally **(4)** the extra large sized bodies (WHR of 0.9) were evaluated as least attractive (*M*=21.48, SE=3.49).

A Post hoc Test of Tukey HSD, made to know if the difference between each WHR was significant or not, showed that every WHR was significantly different from the others in terms of attractiveness rating (*p*<.05, see appendix VI).

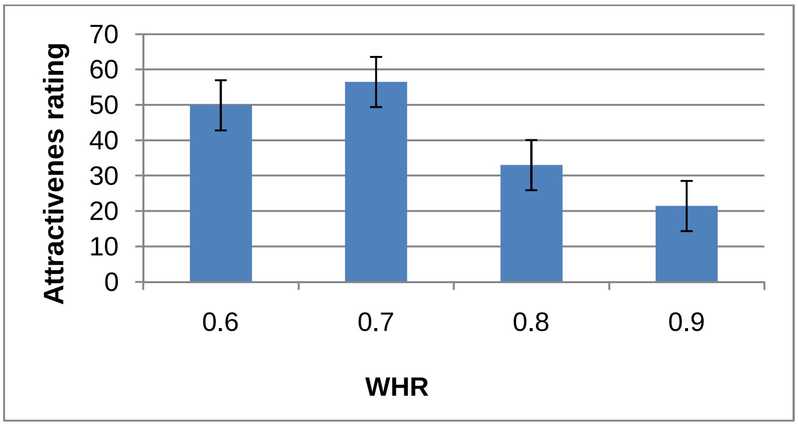

Figure 7. Mean of the evaluation of the physical attractiveness in terms of the WHR (0.6, 0.7, 0.8 and 0.9) of the female bodies. The y-axis represents the attractiveness rating (in [%]) in the rating task and the x-axis the different WHRs (0.6, 0.7, 0.8 and 0.9). Vertical bars denote 0.95 confidence intervals.

Clothes

Moreover, according to the ANOVA analysis, a **main effect of Clothes** was also found ($F(1,38)=6.43$, $p<.05$). On average, **(1)** the naked realistic female bodies have significantly the best rating of attractiveness ($M=41.91$, SE=6.06, see figure 8) compared to **(2)** the bodies that are dressed ($M=38.59$, SE=5.61).

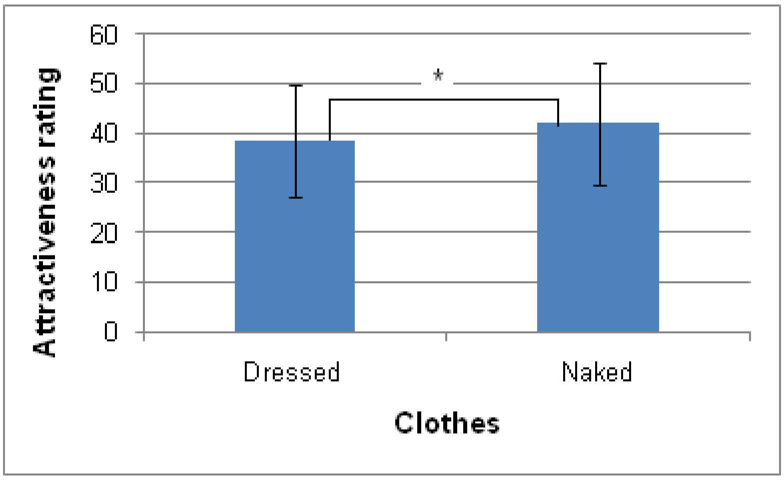

Figure 8. Mean of evaluation of the physical attractiveness according to the clothes of the female bodies (dressed and naked). The y-axis represents the attractiveness rating (in [%]) in the rating task and the x-axis the different clothes (dressed and naked). Vertical bars denote 0.95 confidence intervals. *Note*. * = significant.

Perspective

A **main effect of Perspective** was also found ($F(1,38)=7.34$, $p<.05$). There is a significant difference between the realistic bodies of women seen from back and from front view. Including all the participants (n = 40), we can see that **(1)** realistic female bodies seen from back view significantly have on average the best rating of attractiveness ($M=41.47$, SE=5.52, see figure 9) compared to **(2)** bodies seen from front ($M=39.04$, SE=5.83).

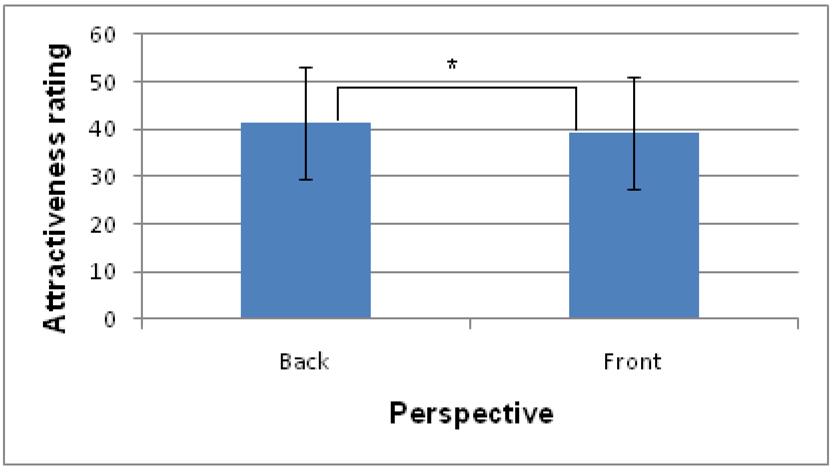

Figure 9. Mean of evaluation of the physical attractiveness according to the perspective (back and front) of the female bodies. The y-axis represents the attractiveness rating (in [%]) in the rating task and the x-axis the different perspectives (back and front).Vertical bars denote 0.95 confidence intervals. *Note*. * = significant.

Perspective x WHR

The ANOVA analysis revealed an **interaction effect between the factors Perspective and WHR** ($F(3,114)= 7.09$, $p<.05$). Descriptively, the WHR of 0.7 was considered as most attractive whatever the perspectives of the female bodies - when the female bodies are positioned in back (*M*=57.89, SE=3.83, see figure 10) and in front (*M*=55.19, SE=3.78). Then, the WHR of 0.6 is considered as the second most attractive female bodies irrespective of the viewpoint too (back: *M*=50.10, SE=3.19; front: *M*=49.78, SE=3.59). Then, the WHR of 0.8 is considered as the third most attractive female body, irrespective of viewpoint (back: *M*=33.75, SE=2.84; front: *M*=32.36, SE=3.11). Finally, the WHR of 0.9 is evaluated as the least attractive, again irrespective of the viewpoint (back: *M*=24.13, SE=2.54; front: *M*=18.82, SE=2.56).

According to the Tukey's Post hoc Test, there was a significant difference between bodies seen from front and from back only when their WHR was 0.7 or 0.9 ($p<.05$, see appendix VII), whereas the difference was not significantly different in terms of attractiveness rating for the WHRs 0.6 ($p=.99$, n.s.) and 0.8 ($p=.67$, n.s.).

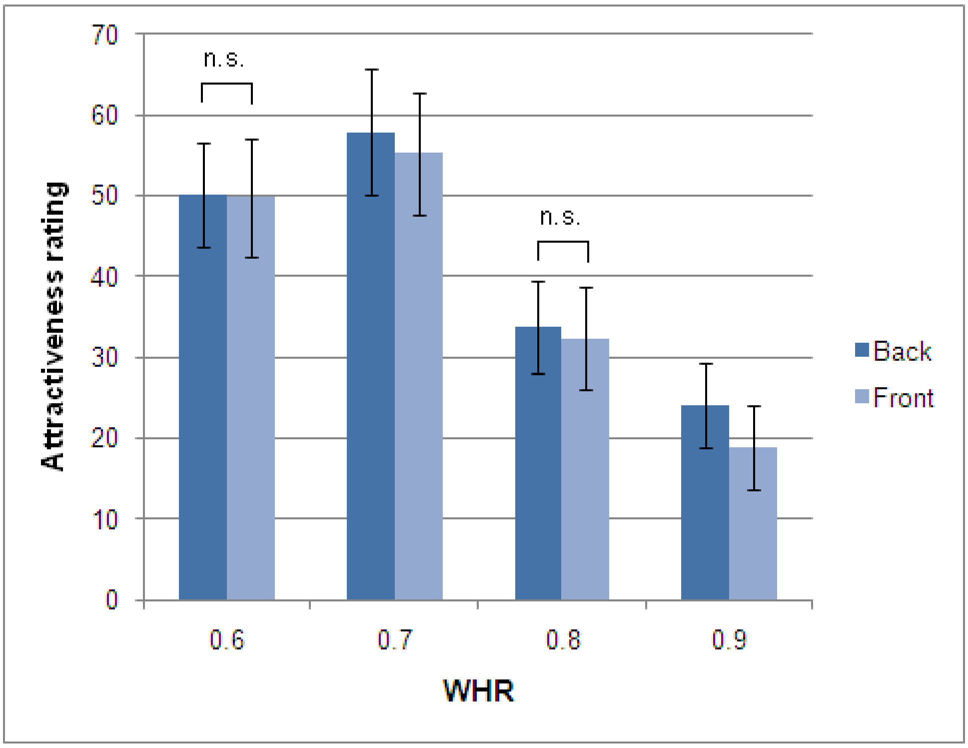

Figure 10. Mean of evaluation of the physical attractiveness according to the perspective (back and front) and to the WHR (0.6, 0.7, 0.8 and 0.9) of the female bodies. The y-axis represents the attractiveness rating (in [%]) in the rating task and the x-axis the different WHRs (0.6, 0.7, 0.8 and 0.9) in terms of the different perspectives (back = dark blue; front = light blue). Vertical bars denote 0.95 confidence intervals. *Note.* n.s. = not significant.

Clothes x WHR

Finally, an **interaction effect Clothes x WHR** was found ($F(3,114)= 55.52$, $p=.00$). Participants preferred on average and in a significant way the naked female bodies compared to the dressed bodies when the WHR is 0.7 (naked: $M=61.47$, SE=4.1; dressed: $M=51.61$, SE=3.63, see figure 11) or 0.6 (naked: $M=54.22$, SE=3.63; dressed: $M=45.65$, SE=3.35). Conversely, they significantly preferred on average the dressed stimuli compared to the naked ones when the WHR is 0.9 (dressed: $M=24.45$, SE=2.51; naked: $M=18.50$, SE=2.79).

However, according to the Post hoc Test of Tukey HSD, there was no significant difference between dressed and naked female bodies when the WHR was 0.8 ($p=.99$, n.s., see appendix VIII; naked: $M=33.47$, SE=3.35; dressed: $M=32.64$, SE=2.83). Moreover, these comparisons showed that naked female bodies with a WHR of 0.6 and dressed female bodies with a WHR of 0.7 were also not significantly different ($p=.15$, n.s.).

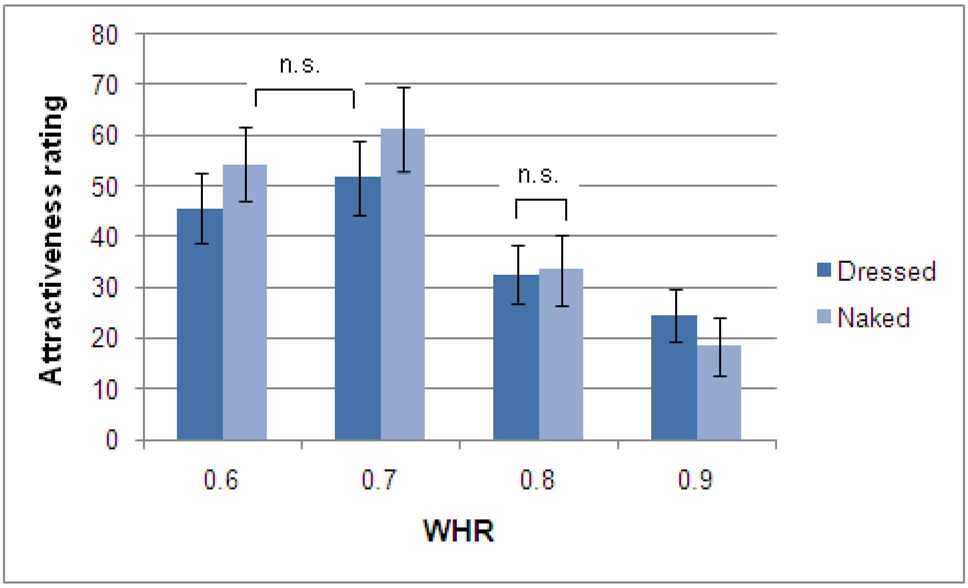

Figure 11. Mean of evaluation of the physical attractiveness according to the clothes (dressed and naked) and to the WHRs (0.6, 0.7, 0.8 and 0.9) of the female bodies. The y-axis represents the attractiveness rating (in [%]) in the rating task and the x-axis the different WHRs (0.6, 0.7, 0.8 and 0.9) in terms of the different clothes (dressed = dark blue; naked = light blue). Vertical bars denote 0.95 confidence intervals. *Note.* n.s. = not significant.

3.4 Discussion

The aim of this behavioral experiment was to investigate the characteristics of physical attractiveness by asking heterosexual observers of both genders to rate the level of attractiveness of naked and clothed realistic female bodies. The bodies presented had different WHRs (0.6 to 0.9) and were viewed from two different perspectives (back vs. front). With this in mind, our first goal was to investigate which conditions are evaluated as the most physically attractive at a behavioral level. We expected that bodies with a low-medium WHR (i.e., 0.7) would be evaluated in the rating task as more attractive than the other WHRs (i.e., 0.6, 0.8 and 0.9). For exploratory purposes, we were also interested in investigating the attractiveness rating associated with the presence of clothing and the viewing perspective of female bodies. In this section, we start by discussing the main results obtained during this experiment and the links to relevant literature. Then, the contribution of this study will be presented and a comparison made to previous studies. After presenting the limitations of this study, some suggestions for future research and improvements will be outlined.

First, with respect to the results, this study descriptively showed that **naked female bodies with a WHR of 0.7 seen from back** were evaluated as the most attractive by all participants, whereas naked bodies with a WHR of 0.9 seen from front were evaluated as the least attractive, irrespective of gender. We thus found no significant difference between **genders**; men and women shared the same female body preference in terms of attractiveness. This is consistent with the findings of Cornelissen et al. (2009) and Tovée and Cornelissen (2001), who found a **similarity** between genders in terms of their evaluation of the attractiveness, and thus confirms the mate selection theory previously discussed. Since women, like men, are able to evaluate which female body is attractive in a similar way, they can evaluate and compare their own level of attractiveness to that of other women. In this way, they can choose a mate on par with themselves in terms of attractiveness, which is efficient in that well matched partners are more likely to have a successful relationship (Currie & Little, 2009).

Then, an interesting result concerns the **WHR** since a gradient of attractiveness was found: the WHR of **0.7** was considered as the most attractive, followed by the WHR of 0.6, then by the 0.8 and finally the 0.9. These results confirm our hypothesis of the WHR of 0.7 as being the most attractive WHR and show that low WHRs have a better rating than higher WHRs in terms of attractiveness. This is consistent with results found in previous studies with participants coming from industrialized societies that also showed a preference for a low WHR of 0.7 (e.g., Dixson et al., 2011; Furnham et al., 2005; Singh, 1993; Swami & Tovée, 2005). The most attractive female bodies are thus shaped as an hourglass, i.e. a small waist with bigger hips and breasts (Gitter et al., 1983, cited by Barber, 1995). The WHR of 0.7 is preferred since many virtues of health and fertility are attributed to it and it corresponds to the optimal fat distribution for the best female fertility. Indeed, a lower WHR is related to the reproductive period for women, since after the menopause the WHR increases because of hormone action. Moreover, another explanation for this low WHR preference in our study is that the participants are living in an industrialized society and are influenced by Western media that promotes an ever-thinner body ideal. Furthermore, these participants are living in a society where there are enough food resources, so a higher WHR is not preferred since participants are not facing starvation and do not lead a life oriented toward constant search for food. Thus, our results contrast with the WHR preference found in remote cultures, where higher WHRs are preferred, because these ratios are related to food abundance. Moreover, higher WHRs (i.e., 0.9 and 1.0) represent typically masculine proportions, whereas a WHR of 0.7 is a typically feminine WHR (Singh & Young, 1995) - perhaps a supplementary explanation for the reasons that higher WHRs are evaluated as less attractive for female bodies in this study. Furthermore, since every WHR was significantly different from the others in terms of attractiveness rating, it shows that the evaluation of physical attractiveness is sensitive to even small WHR changes, and both genders are sensitive to the WHR parameter. Our results revealed also that the WHR of **0.7** was considered as the most attractive regardless of the viewing perspective of the female bodies (**front vs. back**), suggesting that the low WHR preference is a reliable and constant cue. Indeed, it is crucial that men can evaluate and use this morphological cue regardless of the female position, and it is also important for the women to advertise their qualities, irrespective of their position.

Consequently, this morphological trait, reflecting the fat distribution, is a relevant measure of female physical attractiveness, since it is a predictor of female health and reproductive success. With the WHR preference of 0.7, our results are in line with the evolutionary perspective. This WHR preference was encouraged by natural selection, and more specifically by intrasexual selection. Women advertise their qualities to men with the WHR, related to the female fertility and health, whereas men are able to evaluate the female's reproductive quality with this morphologic cue.

Then, concerning the **clothes**, behavioral results show that **naked** bodies are more sexually attractive than dressed ones. To our knowledge, our study is the first that investigated these conditions, but the result can be easily understood: naked bodies have crucial biological value (Costa et al., 2003) since they are related to sexual desire and the reproduction act (Ortigue & Bianchi-Demicheli, 2008), behaviors that enhance the number of descendents and so the reproductive success. More specifically, for the WHRs of **0.6 and 0.7**, participants preferred the **naked** bodies compared to dressed bodies, whereas the opposite is true for the WHR of **0.9** where the **dressed** bodies were considered to be more attractive than the naked ones. However, the dressed and naked bodies with a WHR of 0.8 are evaluated identically. Thus, these results show that for the low WHRs (i.e., 0.6 and 0.7), which were evaluated as more attractive than higher ones, participants preferred to see the bodies naked, whereas bodies with a higher WHR (i.e., 0.9), which is evaluated as the least attractive, are preferred with clothes. Moreover, naked female bodies with a WHR of 0.6 and dressed female bodies with a WHR of 0.7 are not significantly different in terms of attractiveness; a female body with a WHR of 0.7, even dressed, is evaluated as attractive as a naked female body with a WHR of 0.6, showing again that the WHR of 0.7 is very important in the attractiveness evaluation.

Finally, regarding the **perspective** of the female bodies, bodies seen from the **back** are evaluated as the most attractive compared to bodies seen from the front. More specifically, back and front female bodies are significantly different in terms of attractiveness only for the most attractive ratio (i.e., WHR of 0.7) and for the least attractive ratio (i.e., WHR of 0.9). As with clothes, to our knowledge, there is no study that specifically compared these two conditions. At first glance, we could think that female bodies viewed from the front would be evaluated as most attractive for human beings, since the genitals, useful for the reproduction, are localized in the front part of the female body. Instead, this result suggests that the preference of perspective is perhaps due to a more innate and instinctive mechanism, which stems from the way that a lot of animals copulate (from behind), or perhaps because the female buttocks, only seen in the back-view, represents an area of high fat deposition.

Thus, this study yields important results for the relevant characteristics of perceived sexual attractiveness of realistic female bodies. First, it confirms the hypothesis of a low WHR preference and that this ratio is a relevant measure of physical attractiveness. Our results thus corroborate the literature on female sexual attractiveness traits. Moreover, this study adds knowledge concerning two new categories, namely the effect of clothes and the viewing perspective of female bodies.

We can now evaluate the **advantages** and **originality** of our study compared to previous studies. First, we used a new set of realistic **stimuli** which allows easily modifying the characteristics for multiple conditions, whereas in previous studies, photographs of real women or line drawings were often used (e.g., Currie & Little, 2009; Marlowe et al., 2005), which limits manipulation potential. By consequence, in many previous studies, female bodies are often presented only from front view, or only naked, or only dressed (e.g., Swami et al., 2007b; Swami et al., 2008). Our technique of the stimuli creation thus provides an easy way to manipulate our parameters of interest, while holding the weight constant (Henss, 2000). Moreover, participants evaluated the attractiveness of bodies with numerous stimuli (i.e., 192), which is more than usually used in previous studies (e.g., 27 in Furnham et al., 2004). Furthermore, by presenting only one body at a time on the screen, there is no opportunity for the subject to consciously compare the models (Henss, 2000), whereas in many previous studies, participants were presented all stimuli on the same sheet and asked to choose the most attractive body (e.g., Marlowe & Wetsman, 2001). Consequently, a new set of realistic stimuli was validated by this study and generalized to our set the previous findings about a low WHR preference. Another advantage of this study is the **population**. Participants from both genders evaluated the female bodies, which allowed comparing gender-specific ratings, whereas in many studies, only male participants were included (e.g., Furnham et al., 2005; Singh & Young, 1995; Swami et al., 2008).

Our study has also some **limitations**. We could suspect that the **stimuli** used in this study are not as naturalistic as photographs, but we demonstrated that our set of stimuli is strongly sensitive to the different characteristics of physical attractiveness. Then, as in previous studies (e.g., Swami et al., 2007b; Tovée & Cornelissen, 2001), participants involved in this study are young, at a crucial **age** for partner selection. We can thus ask ourselves if our results can be generalized to all people independently of their age; for instance, if an older person would have the same preferences in terms of attractiveness criteria. However, a study showed that the age has no significant effect on the attractiveness evaluation (George et al., 2006, cited by Swami et al., 2007b), suggesting that our results would be identical with older persons, for instance. Finally, some **participants** related after the completion of the experiment that there were trying to remember the rating that they assigned to specific models, since each model was shown 16 times, although with different combinations of parameters. Also, even though the rating task was anonymous and done in private, some participants reported long after the experiment that they were a little bit constrained to rate naked women, and in connection with this, we can also ask ourselves whether they responded in a social desirability way. However, even if some participants were trying to remember their previous rating or if they felt constrained, the results demonstrated a significant difference between experimental conditions, showing that attractiveness rating is an instinctive mechanism.

We can finally discuss some future **perspectives**. First, we asked participants to rate female bodies in terms of attractiveness, but it could be interesting to ask them to also rate the bodies in terms of **health**, to investigate if the two ratings converge. Moreover, since the type of **relationship** (i.e., short- or long-term) can influence female WHR preference, it could also be interesting to ask participants to rate in view of these two kinds of relationships, to see whether there is also a difference as was shown in previous studies that found a lower WHR emphasized for short-term relationships (Currie & Little, 2009; Swami et al., 2008). While we used static pictures, it could be interesting to also investigate **dynamic** bodies, since some specific movements of a body can add a supplementary attractiveness and can also inform about the physical coordination or the social importance of the person (Currie & Little, 2009). Then, our set of stimuli could be used to investigate the factors involved in **eating disorders** and problems related to body image (Swami et al., 2007b). Finally, while so far, the studies included only heterosexual participants (e.g., Currie & Little, 2009; Swami et al., 2007b; Swami et al., 2008) another population could be involved, such as the **homosexuals or lesbians,** to investigate whether there is a divergence between heterosexual and homosexual ratings. For instance, the study of Swami and Tovée (2006c), even though it concerns the BMI, is interesting in this context. These authors showed that there was a significant difference between heterosexual women and lesbians in terms of attractiveness, the lesbians preferring higher BMIs as compared to heterosexual women, as though the two groups have a different body ideal (Swami & Tovée, 2006c). Thus, it would be interesting to investigate this population in relation with the WHR preference.

After having investigated the characteristics of physical attractiveness at the behavioral level in a conscious way, it is now interesting to explore the underlying cognitive and physiological mechanism of perceived female bodies. For this reason, we will now investigate the time course of cerebral activation for all these categories of biologically relevant sexual stimuli with an **electrophysiological experiment** to see whether there is a specific cerebral signature of these stimuli.

4. Electrophysiological experiment – ERP study

In this section the method used for the electrophysiological experiment will be outlined. An account of the personal characteristics of the participants will be followed by an explanation of the experimental procedure itself. Finally, the results of this study will be presented and discussed.

4.1 Method

4.1.1 Population

ERPs (Event-Related Potentials) from 24 healthy adult volunteers (12 men and 12 women) were recorded for this electrophysiological experiment. However, 4 participants (2 men and 2 women) were excluded from the EEG analysis as the number of rejected periods exceeded 50% due to excessive contamination of their EEGs by artifacts - too many blinks and eye movements - in the visual inspection of the raw EEG. Electrophysiological results are therefore based on a sample of **20 participants (10 men and 10 women)**.

The mean age of the 20 participants is 25.6 years (SD = 3.8, range = 22-36). The subjects, different from those involved in the behavioral experiment, were recruited among our friends and also using posters on the wall at the University of Geneva. Participants received a remuneration of 30 CHF for their time and they were not informed about the objectives of the study.

Most participants reported that they were right-handed (n = 18) with a quotient of laterality above 0 (min = 26, max = 100) and only 2 participants were left-handed with a quotient of laterality below 0 (- 72 and - 80). All the participants have normal or corrected-to-normal vision and none of the subjects had ever suffered from neurological or psychiatric disorders.

As in the behavioral experiment, the main criterion for inclusion related to the **sexual orientation** of participants (i.e., heterosexual). Consequently, when asked about their sexual identity, all the participants in the study (n = 20) stated that they were straight heterosexual. More specifically, the majority of participants (n= 18) stated that their sexual feelings were exclusively heterosexual and only 2 women stated that they were predominantly heterosexual and only occasionally homosexual. Overall participants had had between zero and over fifty opposite-sex sexual partners in their entire lifetime: however, the majority have had between one and ten opposite-sex sexual partners (no opposite-sex sexual partners n=1; one opposite-sex sexual partner n= 5; two n= 4; between three and five n= 4; between six and ten n= 3; between eleven and twenty n= 2; more than 50 n = 1).

4.1.2 Material

First of all, written information about the experiment and 4 personal questionnaires were administered to the participant before the task. The **written information** (see appendix IX) explained the purpose of the study to the subjects; that it to say it was presented as an investigation into the neuropsychology of affect and a study of the brain areas responsible for different aspects of emotions. This information sheet also outlined the strict confidentiality of personal information. **Two confidential questionnaires** were also administered: the first (see appendix X) to know the name of the participant, his/her gender, date of birth, profession, the number of years of study and the second (see appendix XI) to assess the amount of sleep during the night prior to the experiment, the amount of coffee, tea, cigarettes, medicine, drug and/ or alcohol consumed on that day or during the 24 hour period prior to the experiment, and the presence of health or neurological problems. The **Sexual Orientation Questionnaire** (SOQ; see appendix III) was also used, as in the behavioral experiment, to assess the sexual orientation of participants. The **Edinburgh Handedness Inventory** (Oldfield, 1971, see appendix XII), a test assessing the laterality, was finally administered, in which participants must indicate their manual preference for every activity (e.g., write, draw, sew, take a pair of scissors, brush their teeth, etc.).

Concerning the stimuli used for this experiment, the **192 stimuli of realistic women** were identical to those used in the behavioral experiment. However, the experimental procedure differs somewhat in that for this electrophysiological experiment, participants will see two additional types of stimuli - **pseudo animals and male bodies** -, which serve as distracter targets (see figure 12). These distracters were also created with Quidam 3.1.5 software. Because the task is relatively long, they are required in this experiment to maintain the participant in a state of vigilance by asking to the participant to press a button as soon as he/she will see them. Another outcome of this experiment is that it allows us to analyze the EEG signals associated with the female body stimuli, our stimuli of interest, without having a motor response from the subject since the motor response is associated with distracter targets.

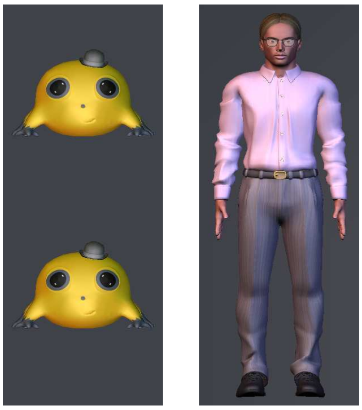

Figure 12. From left to right: example stimuli of pseudo-animal and of male bodies used in the electrophysiological experiment.

A statistical analysis of the **luminance** of the 192 realistic female bodies was carried in order to eliminate the possibility that the observed differences in the electroencephalogram were due to a significant difference of luminance between the different women's bodies. Therefore, Image J software was used to obtain the luminance for each of the 192 pictures and then the 192 stimuli were grouped into 16 conditions. We obtained the mean of the luminance for the 16 conditions for the 12 models (12 x 16), following which a Repeated Measures Analysis of Variance (ANOVA) 2 Clothes x 4 WHR x 2 Perspective was performed. The results (see appendix XIII) showed that the difference between the luminance of the models in the 16 conditions was not significant: Perspective (p>.05, n.s.), Clothes (p>.05, n.s.), WHR (p>.05, n.s.), Perspective x Clothes (p>.05, n.s.), Clothes x WHR (p>.05, n.s.) and Perspective x Clothes x WHR (p>.05, n.s.). Thus, stimuli were equiluminant. This procedure enabled us to exclude the possibility that differences in the amplitude of early ERPs could be due to uneven luminance of the realistic female bodies since the differences are not significant.

Finally, **three computers** were used to carry out the experiment. The first was to observe participants during the experiment through a webcam to ensure that they viewed the screen or did not sleep, for example. The second was to run the experiment with the E-prime software, which was used to collect behavioral responses during the electrophysiological experiment. The third was to run and record the ERPs signal with the Biosemi software. Finally, a **microphone** was used to speak to the subject between the sessions and to announce new instructions for the next session.

4.1.3 Experimental procedure

The electrophysiological experiment took place in the laboratory of psychophysiology in the basement of the building UniMail at the University of Geneva and lasted at least **2 hours**.

Given that the procedure was quite lengthy, all the equipment was prepared for the subjects to commence as soon as they entered the laboratory. First, participants read the **information** to give **written consent** certifying that they had been fully informed of the general aims of the study. For avoiding biasing the results of the experiment, the specific goals of were only explained at the end of the experiment. It was ensured that subjects had sufficient time to reflect before taking the decision to participate; participants were reassured that the information collected would remain strictly confidential, that they could withdraw their agreement to participate at any time and that they did not have to justify this withdrawal. Thus, participants all gave informed consent (see appendix IX) according to standard ethical requirements. Subsequently, the **4 personal information questionnaires** outlined in the material's section were completed by the subject. Then the experimenters measured the subject's head to find the middle of the head to place the **128 electrodes-cap** correctly. While two experimenters introduced gel and electrodes into the cap, the subject read the **instruction** (see appendix XIV) and was allowed to ask any questions about the task. When the installation of the electrodes was finished, an experimenter installed the subject in a **Faraday cage**, a quiet environment where the subject is not likely to be distracted. The whole experiment took take place in this electrically-shielded room in which the brightness is kept constant for all subjects. The experimenters then adjusted the electrodes in order to ensure an optimal record of brain activity: impedances were kept below 20 kΩ. Subjects were instructed to fixate the centre of the screen and to avoid any eye or body movements during the recording session

On completion of these preparations, the experiment began. Subjects had to look at the stimuli in the middle of the screen. The distance between the eyes' subject and the stimuli on the screen were 114 cm and the pictures size was 3.5° x 10°. The stimuli included female bodies - the same realistic models as the behavioral experiment - and two types of distracters - pseudo-animals and male bodies. The stimuli were presented during 250 ms, with an inter stimulus interval (ISI) varying between 1000 and 1200 ms.

Similar to the Go/NoGo task, participants were asked to **respond manually** by pressing a key with the **left or right index** when they saw a **pseudo-animal** or a **male body** - depending on the session -, but not to a female body (see figure 13). There were 8 sessions and between each session the experimenter spoke to the subject over the microphone to announce the type of target (pseudo-animals or male bodies) they had to respond to, and which hand they should use to do so. The distracters and the hand used to respond were **counterbalanced** across sessions: there were 2 sessions in which subjects had to respond to male bodies with the left hand, 2 sessions with the same distracters but they had to respond with the right hand, and 4 sessions organized in the same way for pseudo-animals. For each subject, the order of the session was randomized. For example, the 8 sessions for one subject could be the following: (1) pseudo-animal with right hand, (2) male bodies with left hand, (3) male bodies with right hand, (4) pseudo-animals with left hand, (5) pseudo-animals with left hand, (6) male bodies with right hand, (7) pseudo-animals with right hand and finally (8) male bodies with left hand.

The experiment began with **2 trial sessions** - one where the subject had to respond to the pseudo-animals and one to the male bodies. The trials ensured that the recording of brain activity was optimal and that the subject had correctly understood the instructions. **Eight sessions followed the trials**: 4 sessions for each of the distracter target as explained above (4 times female bodies/male bodies with 192 female bodies and 7 male bodies and 4 times female bodies/pseudo-animals with 192 female bodies and 7 pseudo-animals). Thus, the presentation of **each stimulus was repeated eight times**; the electroencephalogram has a low sensitivity and so the cognitive task had to be repeated several times (Houdé, Mazoyer & Tzourio-Mazoyer, 2002).

The three **independent variables** (IV) are the same as in the rating task, namely perspective (front vs. back), clothing (dressed vs. naked) and WHRs (0.6, 0.7, 0.8 and 0.9). The **dependent variable** (DV) is the recorded brain activity (ERPs signal), and more specifically the amplitudes and latencies of the P1 and N190 components.

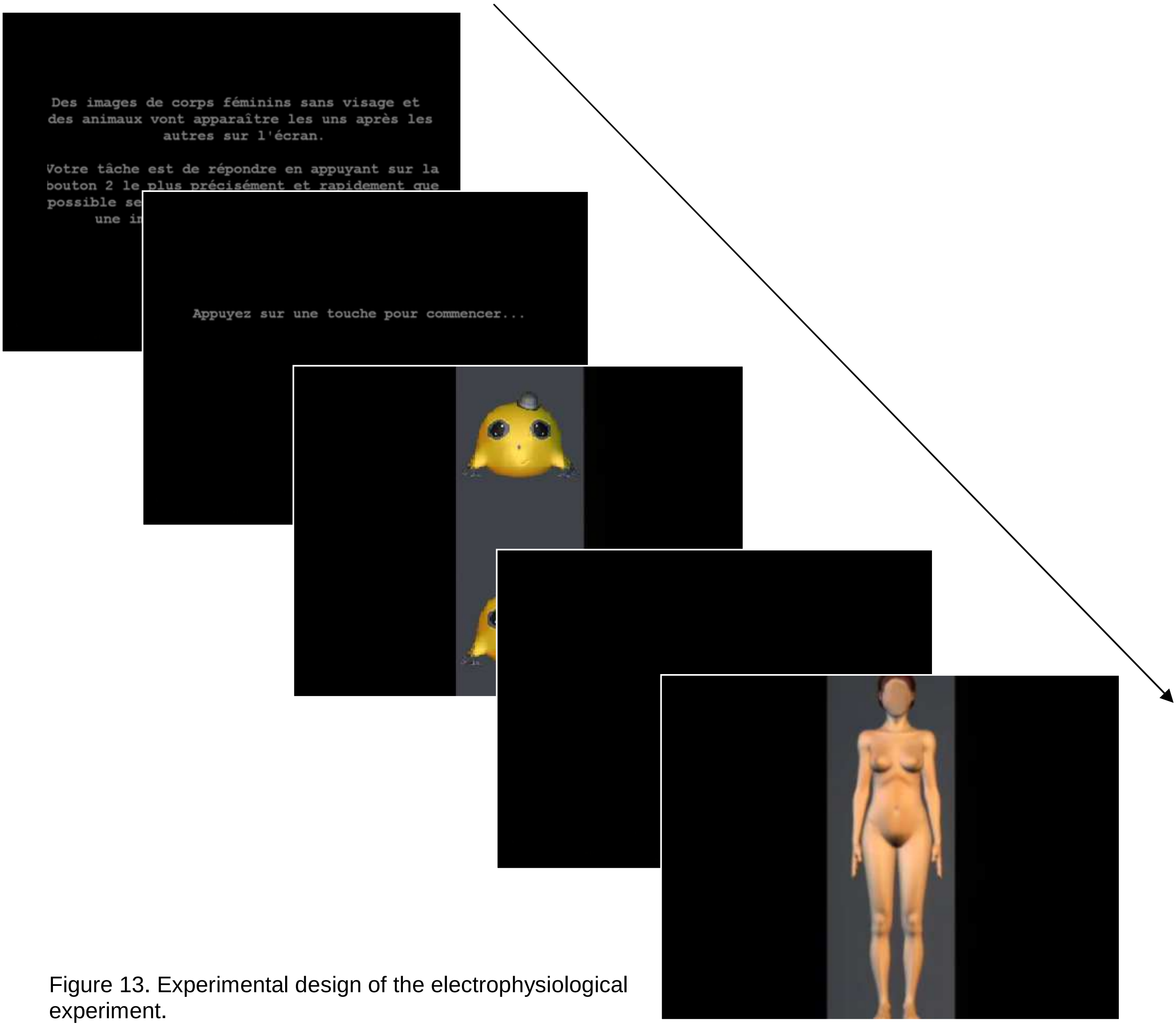

Figure 13. Experimental design of the electrophysiological experiment.

4.1.4 Operational hypotheses

Like the behavioral experiment, this is an **exploratory study**, and there is a lack of prior research on this specific topic, as explained in the theoretical framework section. While we postulate some hypotheses, the objective is also to provide an exploration of main significant results. Thanks to our behavioral outcomes (experiment 1), we developed

hypotheses for this electrophysiological experiment, following the evolutionary view of sexual selection; a modality evaluated as more attractive in the rating task may elicit a greater cerebral response, which can be distinguished from a less sexually attractive condition that is less relevant for mate choice (e.g., Costa et al., 2003). Our hypotheses for this electrophysiological experiment postulated for the amplitude and the latency of the N190 component (Pourtois et al., 2007; Thierry et al., 2006) are thus as follow:

H1: In EEG, we expect to observe the N190 component, a negative deflection at around 190 ms post-stimulus in the occipital cortex (Thierry et al., 2006), appearing in a time window between 154 ms and 228 ms post-stimulus, which is usually seen for body processing (De Gelder et al., 2010), in all conditions of our three categories (WHR, clothes and perspective).

H2: This component should have greater amplitude **(H2-1)** and shorter latency **(H2-2)** when female bodies with a WHR of 0.7 are presented on the screen than for female bodies with the other WHRs (0.6, 0.8 and 0.9), since this WHR of 0.7 is rated most highly for attractiveness in our rating task.

H3: For the same reason, this component should have greater amplitude **(H3-1)** and shorter latency **(H3-2)** when naked female bodies are presented on the screen, compared to the dressed ones.

H4: This component should also have greater amplitude **(H4-1)** and shorter latency **(H4-2)** when female bodies seen from back are presented rather than when front female bodies are presented on the screen, because back female bodies were evaluated as more attractive in the rating task.

Our aim is also to investigate whether naked female bodies with a WHR of 0.7 seen from back, which seem to be evaluated as the most attractive combination by participants in the rating task, elicit a greater amplitude and shorter latency on the N190 component than the other combinations of clothes x perspective x WHR.

Finally, as the P1 component seems also sensitive to body stimuli, we expect to observe this component between around 100 and 150 ms in occipital areas (e.g., Righart & De Gelder, 2007; Thierry et al., 2006) and we will also explore its modulation in link with our conditions.

4.2 Electrophysiological recording and analysis

4.2.1 EEG recording

An electroencephalogram was used to collect ERP data. To do this, brain activity was recorded from a **128 electrode-cap** (4 sets of electrodes: A, B, C and D), mounted in a specially adjusted elastic cap. The 128 scalp sites provide a more precise detection of the brain activity than the 64 electrodes usually used (Gliga & Dehaene-Lambertz, 2005). Five external electrodes were also used: vertical eye movements and eye blinks were detected by one electrode (Ex.4) placed below the right eye; horizontal eye movements were detected by two electrodes (Ex.3, Ex.5) placed at the outer canthi of both eyes and two other external electrodes (Ex.1, Ex.2) were placed on each ear lobe. The brain activity was continuously recorded using a Biosemi System at a sampling rate of 2048 Hz. Electrode impedance was kept below 20 kΩ.

4.2.2 ERPs analysis

Offline, the ERP data were analyzed using Cartool software by Denis Brunet (http://brainmapping.unige.ch/cartool.php, third version). Epochs of 1100 ms (from -100 ms before stimulus onset to 1000 ms after stimulus onset; 100 ms pre-stimulus baseline) were extracted after applied notch filtering at 50 Hz. The high pass filter is 0.09 Hz and the low pass filter is 50 Hz. The threshold value is - 100 µV to + 100 µV. A baseline correction (baseline inferior limit = - 100 ms; baseline superior limit = 0) and an average reference were used. Computerized rejection of electrical artifacts was performed to discard epochs in which eye movements or blinks occurred and also in which the peak-to-peak amplitude of one or several electrodes exceeded +/- 100 µV. Moreover, ERP trials associated with an incorrect behavioral response (false alarms) - when a participant responded to a female body- were also rejected. The rejection rate was ~5%. Three bad electrodes in different subjects - electrode C8 for subject n°4, electrode A12 for sub ject n°9 and electrode B1 for subject n°24 - were interpolated. **Individual ERPs** were analyzed for each subject in each of our 16 experimental conditions (i.e., 2 clothes x 2 perspectives x 4 WHRs). **Grand average ERPs** were then separately computed for each of our 16 conditions of interest by gender. Moreover, a **Grand Average of the Grand Average** was finally computed by gender in order to get grouped conditions (i.e., WHRs 0.6, 0.7, 0.8, 0.9, dressed and naked).

The amplitude of the **N190** was analyzed on lateral occipital areas on electrodes **A14, A15** and **A16** in the left hemisphere and on electrodes **A27, A28** and **A29** in the right hemisphere (see figure 15). In order to investigate the modulation of this component by all the categories mentioned above, the measurements were performed on the mean amplitude obtained on these 6 electrodes in a time frame of 60 ms for female group, centered on the greatest amplitude of this component, determined by a visual inspection of Grand averages ERPs. Consequently, the measurements were performed in a time window between **160 and 220 ms** [130-160TF] post-stimulus for the **female** participants (see figure 14). We obtained the upper and lower bounds of this time window by subtracting and adding 30 ms from the mean time of the maximal amplitude in our conditions. As for the female group, analyses were performed for the **male** group on the mean amplitude obtained on these 6 electrodes in a time window where the lower bound is taken 20 ms after the female participants one, namely in a time window between **180 and 220 ms** [140-160TF].

The amplitude of the **P1** component was analyzed on temporo-occipital areas on electrodes **D32, A10, A11** and **A12** in the left hemisphere and on electrodes **B10, B7, B8** and **B9** in the right hemisphere (see figure 16). Like for the N190, analyses were performed on the mean amplitude obtained on these 8 electrodes, in a time window between **122 and 162 ms** [112-132TF] for both genders (see figure 14).

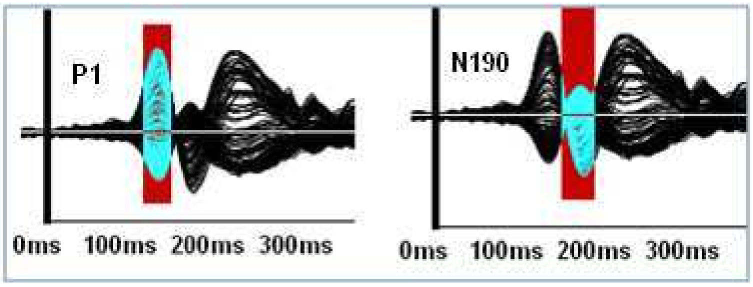

Figure 14. Grand-averaged waveforms for all the conditions combined. On the left: red rectangle denotes the time window analyzed for the P1 component. On the right: red rectangle denotes the time window analyzed for the N190 component.

Then, within each of these time windows of N190 and P1, we performed a **peak analysis** by measuring the amplitude and its related latency of the maximal peak, as the maximum negative value for N190 and as the maximum positive value for P1 during the selected time-window, for each subject in each of the 16 conditions and for each electrode.

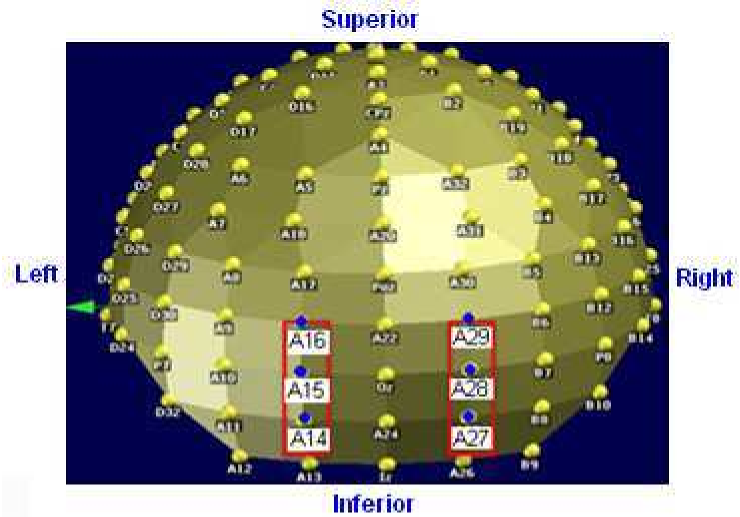

Figure 15. Map of the 128 scalp sites. Blue points denote selected electrodes for the N190 component: A14, A15, A16, A27, A28 and A29.

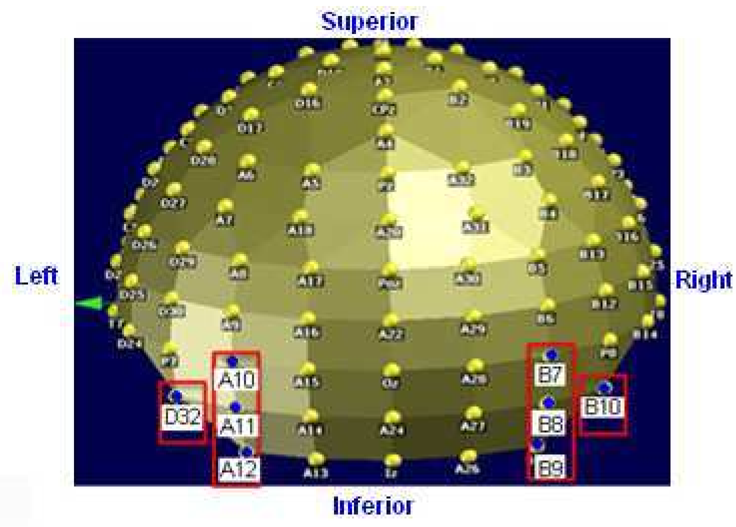

Figure 16. Map of the 128 scalp sites. Blue points denote selected electrodes for the P1 component: D32, A10, A11, A12, B7, B8, B9 and B10.

4.2.3 Data analysis

For all the ERP's analysis, we used an ANOVA design with the factors **Clothes x Perspective x WHR x Hemisphere x Electrode**. This Electrode factor changes according to the component of interest, depending on the number of selected electrodes. The conditions of application for a Repeated Measures Analysis of Variance (ANOVA) were respected.

Two **ANOVA** 2 Clothes x 2 Perspective x 4 WHR x 2 Hemisphere x 3 Electrode was performed for the **N190** component, one ANOVA for its amplitude and one for its latency. Similarly, two ANOVA 2 Clothes x 2 Perspective x 4 WHR x 2 Hemisphere x 4 Electrode were performed for the **P1** component. All multiple comparisons of means were performed by Post hoc **Tukey** tests.

4.3 Electrophysiological results

Below, electrophysiological results of the two components of interest - N190 and P1 - will be presented. For each component, its amplitude will be presented and then its latency in connection with our hypotheses previously postulated concerning the WHR, the clothes and the perspective. Moreover, since it is over all an exploratory study, additional analyses were conducted and will be presented after the results related to our hypotheses, in order to specify the impact of our conditions on the amplitude and on the latency of these components.

4.3.1 N190

4.3.1.1 Amplitude of N190

The amplitude of the N190 component is on average **- 2.16 µV** for all conditions combined. Descriptively, the mean amplitude is maximal on electrode A27 when naked female bodies with a WHR of 0.6 seen from front were presented (*M*=-3.74 µV, SD= -11.80) and is minimal on electrode A29 when dressed female bodies with a WHR of 0.8 seen from back were presented (*M*=-0.99 µV, SD=-5.67). Since there are 96 conditions (2 clothes x 2 perspectives x 4 WHRs x 2 hemispheres x 3 electrodes) which is a lot to describe in detail in this section, the mean amplitude of the N190 component for each of these 96 conditions can be seen in the appendix XV. In addition, the mean amplitude in which the WHR, the perspective, the clothes and their interaction are separated can be seen in appendix XVI. Below, results obtained with the ANOVA 2 (Clothes) x 2 (Perspective) x 4 (WHR) x 2 (Hemisphere) x 3 (Electrode) will be presented and will allow us to respond to our hypotheses on the N190 amplitude (see table 4).

Effect	SS	Degree of Freedom	MS	F	p
WHR	47.26	3	15.753	9.84761	0.000028
Clothes	321.16	1	321.156	21.98939	0.000183
Perspective	42.15	1	42.152	11.30630	0.003468
Gender	3583.43	1	3583.434	4.53131	0.047346
Hemisphere	20.97	1	20.971	0.16868	0.686131
Electrode	268.52	2	134.259	7.45429	0.001955
WHR x Gender	14.23	3	4.743	2.96513	0.040037
WHR x Hemisphere	2.46	3	0.820	1.72834	0.172084
WHR x Electrode	3.66	6	0.611	3.15503	0.006863
Clothes x WHR	9.82	3	3.274	1.05361	0.376482
Clothes x Perspective	0.00	1	0.002	0.00047	0.982870
Clothes x Gender	16.33	1	16.331	1.11820	0.304293
Clothes x Hemisphere	1.82	1	1.816	0.31302	0.582730
Clothes x Electrode	5.93	2	2.966	3.95377	0.028038
Perspective x WHR	10.84	3	3.612	1.46413	0.234584
Perspective x Gender	0.19	1	0.189	0.05056	0.824622
Perspective x Hemisphere	0.44	1	0.441	0.51358	0.482790
Perspective x Electrode	11.70	2	5.849	25.60829	0.000000
Hemisphere x Gender	71.15	1	71.150	0.57231	0.459129
Hemisphere x Electrode	5.52	2	2.759	0.57380	0.568449
Electrode x Gender	51.03	2	25.515	1.41662	0.255729
WHR x Hemisphere x Gender	1.92	3	0.640	1.35008	0.267884
WHR x Electrode x Gender	0.27	6	0.045	0.23002	0.966064
Clothes x WHR x Gender	5.83	3	1.942	0.62496	0.601978
Clothes x Perspective x Gender	11.51	1	11.510	3.57996	0.074680
Clothes x Hemisphere x Gender	0.95	1	0.954	0.16452	0.689812
Clothes x Electrode x Gender	0.19	2	0.096	0.12840	0.879903
Perspective x WHR x Gender	7.53	3	2.510	1.01733	0.392240
Perspective x Hemisphere x Gender	1.09	1	1.087	1.26622	0.275258
Perspective x Electrode x Gender	0.33	2	0.163	0.71527	0.495878
Hemisphere x Electrodes x Gender	6.93	2	3.464	0.72043	0.493426
Clothes x Perspective x WHR	8.01	3	2.670	1.06049	0.373560
Clothes x Perspective x WHR x Gender	6.91	3	2.302	0.91424	0.440256
Clothes x Perspective x Hemisphere	0.47	1	0.470	0.36691	0.552255
Clothes x Perspective x Hemisphere x Gender	0.15	1	0.153	0.11912	0.733996
Clothes x WHR x Hemisphere	1.41	3	0.471	1.45775	0.236337
Clothes x WHR x Hemisphere x Gender	0.08	3	0.026	0.08098	0.970083
Perspective x WHR x Hemisphere	5.42	3	1.807	3.35794	0.025320
Perspective x WHR x Hemisphere x Gender	6.31	3	2.102	3.90610	0.013457
Clothes x Perspective x Electrode	4.81	2	2.404	10.97057	0.000190
Clothes x Perspective x Electrode x Gender	0.17	2	0.086	0.39283	0.678000
Clothes x WHR x Electrode	0.50	6	0.083	0.83059	0.548787
Clothes x WHR x Electrode X Gender	1.41	6	0.235	2.34885	0.035911
Perspective x WHR x Electrode	0.97	6	0.162	1.00291	0.427337
Perspective x WHR x Electrode x Gender	1.89	6	0.315	1.95211	0.078895

Clothes x Hemisphere x Electrode	0.08	2	0.038	0.11369	0.892851
Clothes x Hemisphere x Electrode x Gender	1.27	2	0.635	1.90268	0.163868
Perspective x Hemisphere x Electrode	0.03	2	0.016	0.08957	0.914530
Perspective x Hemisphere x Electrode x Gender	0.05	2	0.027	0.14881	0.862260
WHR x Hemisphere x Electrode	1.48	6	0.247	2.60337	0.021419
WHR x Hemisphere x Electrode x Gender	0.80	6	0.133	1.39751	0.222204
Clothes x Perspective x WHR x Hemisphere	0.32	3	0.106	0.23642	0.870591
Clothes x Perspective x WHR x Hemisphere x Gender	0.41	3	0.137	0.30539	0.821366
Clothes x Perspective x WHR x Electrode	1.92	6	0.320	1.88998	0.088996
Clothes x Perspective x WHR x Electrode x Gender	0.82	6	0.137	0.80823	0.565711
Clothes x Perspective x Hemisphere x Electrode	0.10	2	0.050	0.18565	0.831353
Clothes x Perspective x Hemisphere x Electrode x Gender	0.09	2	0.044	0.16299	0.850221
Clothes x WHR x Hemisphere x Electrode	0.25	6	0.042	0.45509	0.839970
Clothes x WHR x Hemisphere x Electrode x Gender	0.70	6	0.117	1.27224	0.276183
Perspective x WHR x Hemisphere x Electrode	0.83	6	0.138	1.41924	0.213814
Perspective x WHR x Hemisphere x Electrode x Gender	0.21	6	0.036	0.36749	0.898109
Clothes x Perspective x WHR x Hemisphere x Electrode	0.51	6	0.084	0.83694	0.544020
Clothes x Perspective x WHR x Hemisphere x Electrode x Gender	0.24	6	0.040	0.39963	0.877841

Table 4. ANOVA analysis of the amplitude of the N190. *Note.* Red numbers are those which are significant ($p<.05$).

First, a **main effect of WHR** on the amplitude of the N190 was found ($F(3,54) = 9.85$, $p<.05$): the amplitudes for the different WHRs are significantly different. A Post hoc Tukey test (see appendix XVII) showed that on average realistic female bodies with a **WHR of 0.6** elicited a significantly greater negative amplitude (M=-2.4 μV, SE=3.21, see figures 17-18) than female bodies with the other WHRs ($p<.05$; WHR 0.7: M=-2.16 μV, SE=3.16; WHR 0.8: M=-2.1 μV, SE=3.01; WHR 0.9: M=-1.96 μV, SE=3.21), whereas we hypothesized that the WHR of 0.7 would elicit the greatest amplitude (**H2-1**), since this ratio was evaluated as the most attractive by participants in the rating task (experiment 1). Moreover, the other WHRs (i.e., 0.7, 0.8 and 0.9) are not significantly different from each other in terms of amplitude (WHRs 0.7 and 0.8: p=.87, n.s.; WHRs 0.7 and 0.9: p=.09, n.s.; WHRs 0.8 and 0.9: p=.37, n.s.).

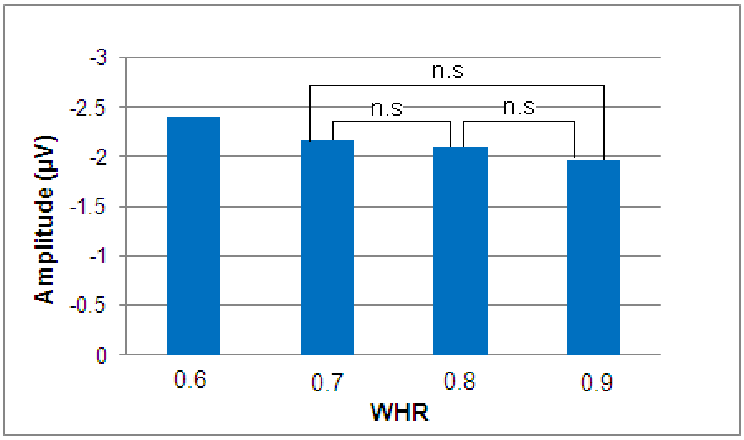

Figure 17. Mean amplitude (µV) of the N190 for the different WHRs (0.6, 0.7, 0.8 and 0.9). *Note*. n.s. = not significant.

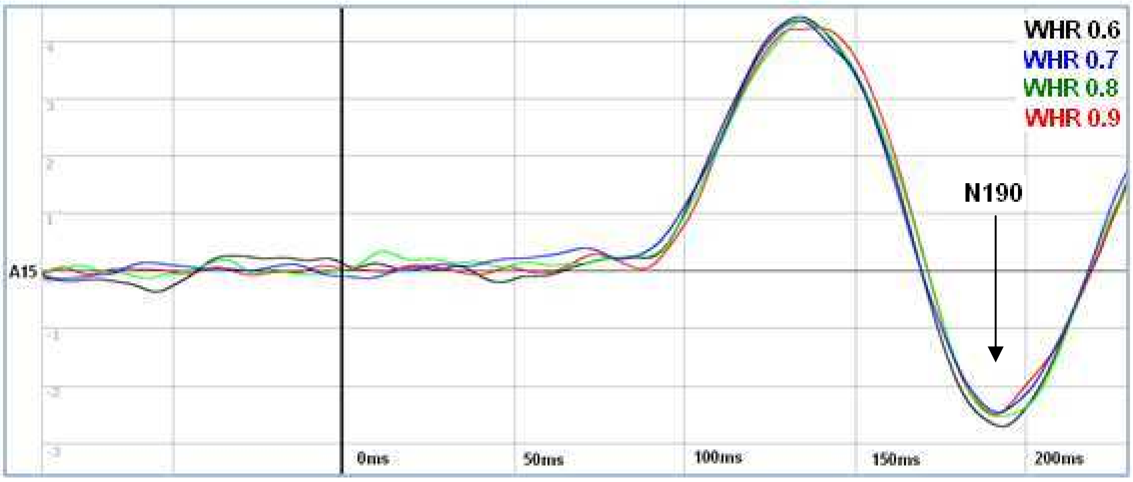

Figure 18. ERPs Grand Average measured at electrode A15 by the 4 WHRs. *Note.* Black line: WHR of 0.6; blue line: WHR of 0.7; green line: WHR of 0.8 and red line: WHR of 0.9.

- Then, concerning the clothes, we hypothesized that naked realistic female bodies would elicit a greater negativity than dressed bodies (**H3-1**). A **main effect of Clothes** was found (F(1,18) = 21.99, p=.00018) as follow: on average, **naked** female bodies elicited a significantly greater negativity (M=-2.56 µV, SE=4.79, see figure 19) than dressed ones (M=-1.75 µV, SE=4.15), confirming our hypothesis.

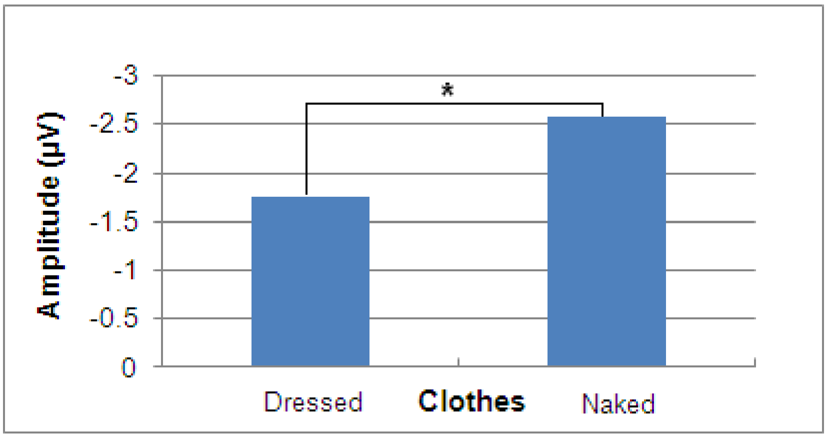

Figure 19. Mean amplitude (µV) of the N190 for the different clothes (dressed and naked). *Note*. * = significant.

Concerning the perspective of the female bodies, we issued (**H4-1**) that female bodies seen from the back would elicit a greater negativity than those seen from the front. According to the ANOVA analysis, a **main effect of Perspective** was found ($F(1,18) = 11.31$, $p=.0035$): female bodies seen from **front** ($M=-2.31$ μV, SE=4.49, see figure 20) elicited on average a significantly greater negativity than female bodies seen from back ($M=-2.01$ μV, SE=4.41), which is the opposite of what we hypothesized with behavioral results where participants evaluated female bodies seen from back as more attractive than those seen from front.

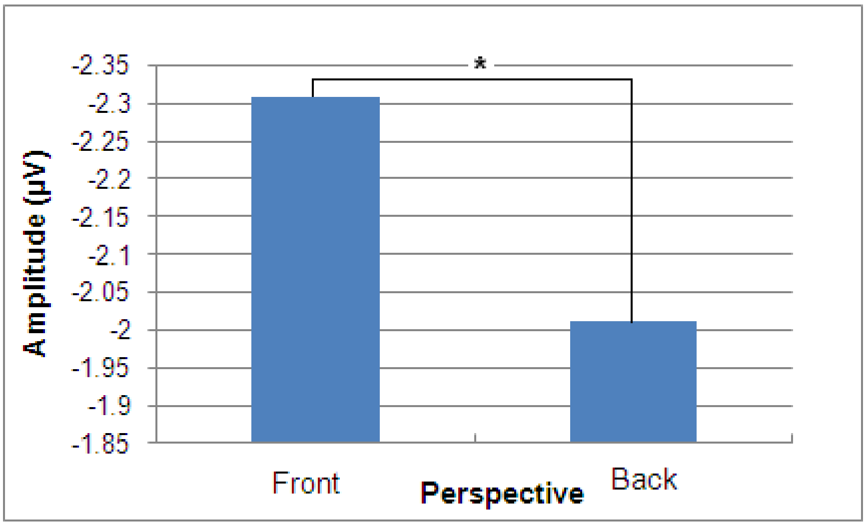

Figure 20. Mean amplitude (μV) of the N190 for the different perspectives (front and back). *Note*. * = significant.

Finally, we wanted to investigate whether the combination naked female bodies with a WHR of 0.7 seen from the back, evaluated as the most attractive by participants in the rating task, would elicit greater amplitude on the N190 component than the other combinations. We did not found an interaction effect of Clothes x Perspective x WHR ($F(3,54) = 1.06$, $p=.37$, n.s.). Moreover, according to the descriptive statistics (see appendix XVI), naked female bodies seen from front with a WHR of 0.6 ($M=-2.99$ μV, SE=1.79) elicited the greatest negativity, and not naked female bodies with a WHR of 0.7 seen from back ($M=-2.60$ μV, SE=1.68), as we previously thought according to the behavioral results.

Additional significant results

Since it is an exploratory study, there are below additional significant results obtained with the ANOVA analysis on the amplitude of the N190.

Gender

A main effect of Gender was found: **male** participants had a greater negativity than female participants ($F(1,18) = 4.53$, $p<.05$), with a mean amplitude of -3.52 μV (SE=0.91) and -0.79 μV (SE=0.91), respectively.

- **Electrode**

A main effect of Electrode was found (*F*(2,36) = 7.45, *p*=.0019). A Tukey's Post hoc Test (see appendix XVIII) revealed that the pair of electrodes A16/A29 located in the most upper part of the occipital area (*M*=-1.71 μV, SE=3.44) and the pair of electrodes A14/A27 located in the lowest part of the occipital area (*M*=-2.62 μV, SE=3.75) have a significantly different amplitude (*p*<.05), in the sense that pair of electrodes **A14/A27** showed a significantly greater negativity than the pair of electrodes A16/A27.

- **WHR x Gender**

An interaction effect of WHR x Gender was found (*F*(3,54) = 2.97, *p*=.04). In addition to a significantly greater negativity elicited in male participants compared to female participants for all the WHRs, in **male** participants, female bodies with a **WHR of 0.6** elicited the greatest negativity (*M*=-3.81 μV, SE=4.54, see figure 21), followed by bodies with a **WHR of 0.8** (*M*=-3.53 μV, SE=4.25), then with a WHR of 0.7 (*M*=-3.38 μV, SE=4.47) and finally with a WHR of 0.9 (*M*=-3.36 μV, SE=4.55). While for **female** participants, female bodies with a **WHR of 0.6** also elicited the greatest negativity (*M*=-0.98 μV, SE=4.54), but followed by female bodies with a **WHR of 0.7** (*M*=-0.94 μV, SE=4.47), then with a WHR of 0.8 (*M*=-0.66 μV, SE=4.25) and finally with a WHR of 0.9 (*M*=-0.57 μV, SE=4.55). A Post hoc Tukey test revealed that WHRs of 0.6 and 0.7 were not significantly different in female participants (*p*=.99, n.s., see appendix XIX), whereas they are significantly different in male participants (*p*<.05). Finally, WHRs of 0.6 and 0.9 are significantly different in terms of amplitude for both genders (*p*<.05).

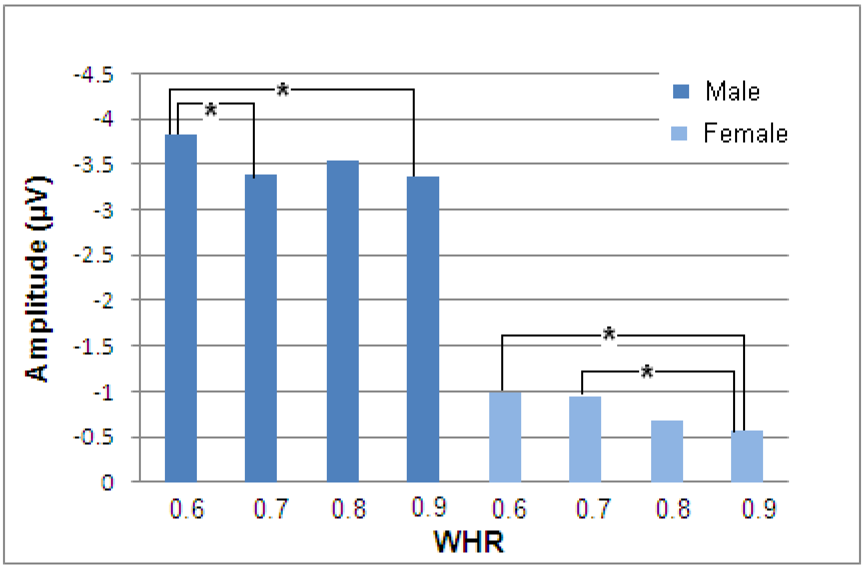

Figure 21. Mean amplitude (μV) of the N190 for the different WHRs (0.6, 0.7, 0.8 and 0.9) by gender (male and female participants). *Note*. * = significant.

- **WHR x Electrode**

An interaction effect of WHR x Electrode was also found (*F*(6,108) = 3.16, *p*=.007). A Post hoc Tukey test (see appendix XX) showed that on electrodes situated in the most **upper** part

(A16/A29), the **WHR of 0.9** is significantly less negative (*M*=-1.52 µV, SE=1.74, see figure 22) than the other WHRs in terms of amplitude (*p*<.05), whereas the other WHRs are not significantly different from each other (*p*>.05, n.s.; WHR 0.6: *M*=-1.86 µV, SE=1.81; WHR 0.7: *M*=-1.73 µV, SE=1.75; WHR 0.8: *M*=-1.72 µV, SE=1.61). Conversely, on the pair of electrodes situated in the **lowest** part (A14/A27), the **WHR of 0.6** elicited a significantly greater amplitude (*M*=-2.92 µV, SE=1.87) than the other WHRs (*p*<.05), whereas the other WHRs are not significantly different from each other (*p*>.05, n.s.; WHR 0.7: *M*=-2.61 µV, SE=1.87; WHR 0.8: *M*=-2.51 µV, SE=1.85; WHR 0.9: *M*=-2.47 µV, SE=1.94).

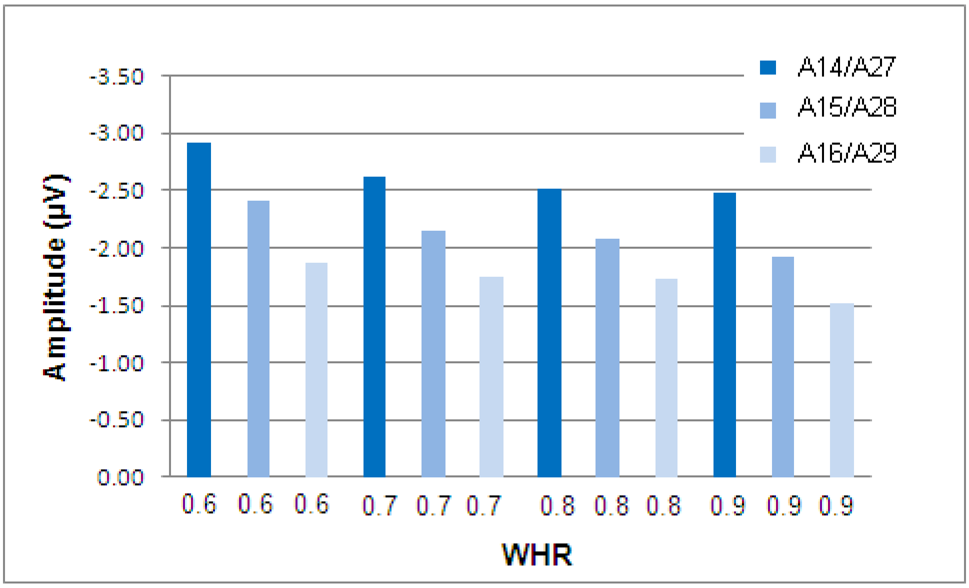

Figure 22. Mean amplitude (µV) of the N190 of the different pairs of electrodes (A14/A27, A15/A28 and A16/A29) and for the different WHRs (0.6, 0.7, 0.8 and 0.9).

Clothes x Electrode

The interaction between Clothes and Electrode was significant ($F(2,36) = 3.95$, $p=.03$). Each pair of electrodes elicited a greater negativity for naked bodies than for dressed ones and the pair of electrodes A14/A27 situated in the lowest part of the occipital area had the greatest negativity (naked: *M*=-3.08 µV, SE=2.82; dressed: *M*=-2.17 µV, SE=2.52, see figure 23), followed by the pair of electrodes situated in the middle part (A15/A28) (naked: *M*=-2.57 µV, SE=3.01; dressed: *M*=-1.69 µV, SE=2.56) and finally by the pair of electrodes situated in the most upper part (A16/A29) (naked: *M*=-2.04 µV, SE=2.62; dressed: *M*=-1.38 µV, SE=2.27). A Tukey's Post hoc Test (see appendix XXI) revealed that all combinations between clothes and the different pairs of electrodes are significantly different in terms of amplitude (*p*<.05), except for naked female bodies on the pair of electrodes situated in the most upper part (A16/A29) and dressed female bodies on the pair of electrodes in the lowest part (A14/A27) which are not significantly different (*p*=.43, n.s.).

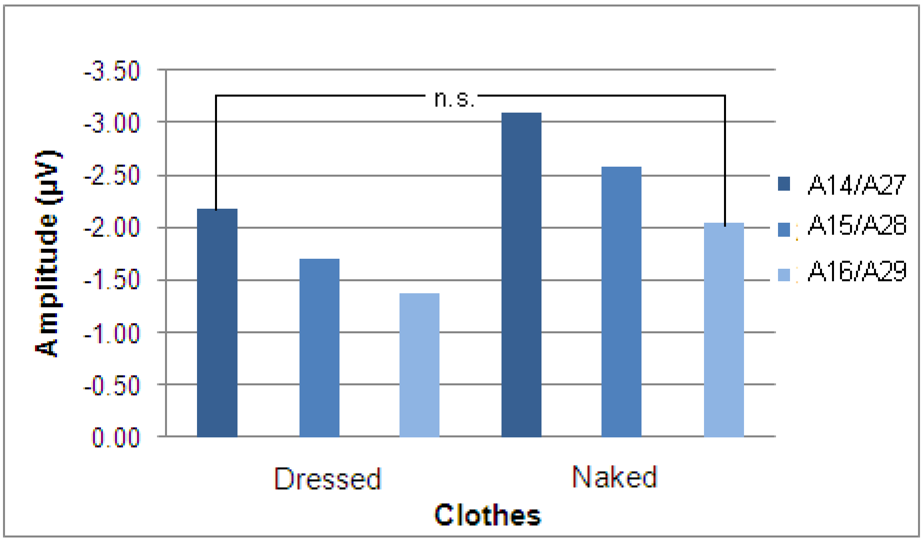

Figure 23. Mean amplitude (µV) of the N190 component of the different pairs of electrodes (A14/A27, A15/A28 and A16/A29) for the different clothes (dressed and naked). *Note*. n.s. = not significant.

- **Perspective x Electrode**

An interaction effect Perspective x Electrode was found ($F(2,36) = 25.61$, p=.00). On each pair of electrodes, bodies seen from front (A14/A27: *M*=-2.86 µV, SE=2.67; A15/A28: *M*=-2.31 µV, SE=2.81; A16/A29: *M*=-1.75 µV, SE=2.48, see figure 24) elicited a greater negativity than bodies seen from back (A14/A27: *M*=-2.39 µV, SE=2.65; A15/A28: *M*=-1.97 µV, SE=2.74; A16/A29: *M*=-1.66 µV, SE=2.41). However, a Post hoc Tukey test revealed that amplitudes elicited by female bodies seen from front and from back are not significantly different on the pair of electrodes A16/A29 (*p*=.19, n.s., see appendix XXII).

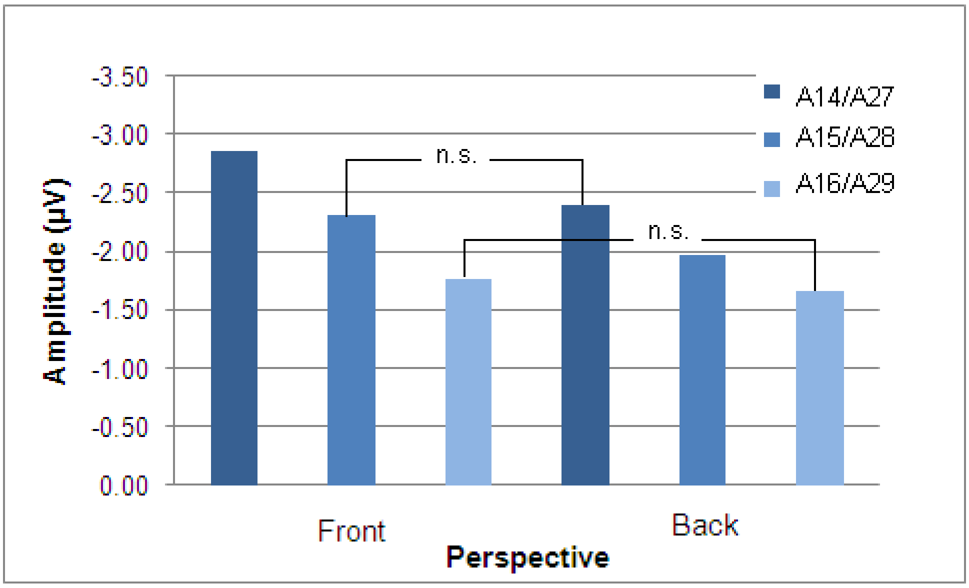

Figure 24. Mean amplitude (µV) of the N190 component of the different pairs of electrodes (A14/A27, A15/A28 and A16/A29) for the different perspectives (front and back). *Note*. n.s. = not significant.

- Finally, the N190 amplitude was also modulated by interaction effects Perspective x WHR x Hemisphere ($F(3,54) = 3.36$, p=.03, see table 4), Perspective x WHR x Hemisphere x

Gender ($F(3,54) = 3.91$, $p=.01$), WHR x Hemisphere x Electrode ($F(6,108) = 2.60$, $p=.02$), Clothes x Perspective x Electrode ($F(2,36) = 10.97$, $p=.0002$) and Clothes x WHR x Electrode x Gender ($F(6,108) = 2.35$, $p=.04$).

4.3.1.2 Latency of N190

The N190 component appeared on average between **158 and 217 ms** with mean latency of **185 ms** for all conditions combined. This mean latency confirms our first hypothesis (**H1**) to observe a negative deflection at around 190 ms post-stimulus in the occipital cortex, the N190. Descriptively, the mean latency was earlier on electrode A16 when naked female bodies with a WHR of 0.8 seen from back were presented on the screen and was later on electrode A27 for dressed female bodies with a WHR of 0.8 seen from back. Since there are 96 conditions (2 clothes x 2 perspectives x 4 WHRS x 2 hemispheres x 3 electrodes), the mean latency for the N190 component for each of the 96 conditions can be seen in the appendix XXIII. In addition, the mean amplitude in which the WHR, the perspective, the clothes and their interaction are separated can be seen in appendix XXIV. Below, results obtained with the ANOVA 2 (Clothes) x 2 (Perspective) x 4 (WHR) x 2 (Hemisphere) x 3 (Electrode) will be presented and will enable to respond to our hypotheses on the latency of the N190 (see table 5).

Effect	SS	Degree of Freedom	MS	F	p
WHR	1023	3	341	5.576	0.002088
Clothes	1637	1	1637	12.212	0.002588
Perspective	109	1	109	0.645	0.432479
Gender	94706	1	94706	8.914	0.007929
Hemisphere	252	1	252	0.815	0.378556
Electrode	12691	2	6346	39.399	0.000000
WHR x Gender	114	3	38	0.620	0.604947
WHR x Hemisphere	14	3	5	0.226	0.877887
WHR x Electrode	135	6	23	1.554	0.167570
Clothes x WHR	246	3	82	1.755	0.166774
Clothes x Perspective	32	1	32	0.391	0.539861
Clothes x Gender	0	1	0	0.000	0.984639
Clothes x Hemisphere	1	1	1	0.013	0.911021
Clothes x Electrode	8	2	4	0.136	0.872953
Perspective x WHR	105	3	35	0.402	0.752382
Perspective x Gender	68	1	68	0.405	0.532715
Perspective x Hemisphere	6	1	6	0.114	0.739666
Perspective x Electrode	20	2	10	0.436	0.649848
Hemisphere x Gender	639	1	639	2.067	0.167653
Hemisphere x Electrode	22	2	11	0.071	0.931653
Electrode x Gender	346	2	173	1.075	0.352071
WHR x Hemisphere x Gender	40	3	13	0.660	0.580408

WHR x Electrode x Gender	94	6	16	1.081	0.378464
Clothes x WHR x Gender	58	3	19	0.416	0.741932
Clothes x Perspective x Gender	86	1	86	1.050	0.318997
Clothes x Hemisphere x Gender	1	1	1	0.006	0.937314
Clothes x Electrode x Gender	14	2	7	0.248	0.781404
Perspective x WHR x Gender	204	3	68	0.779	0.511000
Perspective x Hemisphere x Gender	29	1	29	0.574	0.458427
Perspective x Electrode x Gender	61	2	30	1.329	0.277410
Hemisphere x Electrode x Gender	57	2	29	0.184	0.832565
Clothes x Perspective x WHR	168	3	56	0.981	0.408488
Clothes x Perspective x WHR x Gender	246	3	82	1.438	0.241925
Clothes x Perspective x Hemisphere	29	1	29	1.618	0.219558
Clothes x Perspective x Hemisphere x Gender	1	1	1	0.041	0.841340
Clothes x WHR x Hemisphere	75	3	25	0.980	0.408889
Clothes x WHR x Hemisphere x Gender	84	3	28	1.098	0.357865
Perspective x WHR x Hemisphere	173	3	58	1.471	0.232638
Perspective x WHR x Hemisphere x Gender	25	3	8	0.209	0.889920
Clothes x Perspective x Electrode	2	2	1	0.083	0.920157
Clothes x Perspective x Electrode x Gender	5	2	2	0.183	0.833437
Clothes x WHR x Electrode	113	6	19	1.075	0.382314
Clothes x WHR x Electrode X Gender	122	6	20	1.164	0.331161
Perspective x WHR x Electrode	67	6	11	0.721	0.633143
Perspective x WHR x Electrode x Gender	41	6	7	0.448	0.844771
Clothes x Hemisphere x Electrode	8	2	4	0.226	0.798715
Clothes x Hemisphere x Electrode x Gender	64	2	32	1.841	0.173342
Perspective x Hemisphere x Electrode	5	2	2	0.258	0.773884
Perspective x Hemisphere x Electrode x Gender	58	2	29	3.170	0.053924
WHR x Hemisphere x Electrode	46	6	8	0.857	0.528894
WHR x Hemisphere x Electrode x Gender	87	6	15	1.646	0.141494
Clothes x Perspective x WHR x Hemisphere	51	3	17	0.665	0.576958
Clothes x Perspective x WHR x Hemisphere x Gender	111	3	37	1.465	0.234481
Clothes x Perspective x WHR x Electrode	40	6	7	0.443	0.848709
Clothes x Perspective x WHR x Electrode x Gender	60	6	10	0.673	0.671992
Clothes x Perspective x Hemisphere x Electrode	37	2	19	1.377	0.265383
Clothes x Perspective x Hemisphere x Electrode x Gender	29	2	14	1.059	0.357372
Clothes x WHR x Hemisphere x Electrode	125	6	21	2.122	0.056534
Clothes x WHR x Hemisphere x Electrode x Gender	116	6	19	1.965	0.076868
Perspective x WHR x Hemisphere x Electrode	22	6	4	0.378	0.891327
Perspective x WHR x Hemisphere x Electrode x Gender	45	6	8	0.777	0.590081
Clothes x Perspective x WHR x Hemisphere x Electrode	30	6	5	0.623	0.711736
Clothes x Perspective x WHR x Hemisphere x Electrode x Gender	19	6	3	0.387	0.886241

Table 5. ANOVA analysis of the latency of the N190. *Note.* Red numbers are those which are significant (p<.05).

◆ First, concerning the WHR, we issued the hypothesis (**H2-2**) that female bodies with a WHR of 0.7 would elicit an earlier negativity than bodies with other WHRs (i.e., 0.6, 0.8 and 0.9). A **main effect of WHR** was found ($F(3,54) = 5.58$, $p=.002$). As we hypothesized, female bodies with a **WHR of 0.7** elicited a negative peak occurring significantly earlier ($M=184.18$ ms, SE=11.40, see figure 25) than the other WHRs ($p<.05$; WHR 0.8: $M=185.64$ ms, SE=11.86; WHR 0.6: $M=185.81$ ms, SE=11.96; WHR 0.9: $M=186.06$ ms, SE=11.23). Indeed, a Tukey's Post hoc Test showed that the WHR of 0.7 is significantly different from the other WHRs in terms of latency ($p<.05$, see appendix XXV), whereas the other WHRs are not significantly different from each other in terms of latency (WHRs 0.6 and 0.8: $p=.99$, n.s.; WHRs 0.6 and 0.9: $p=.96$, n.s.; WHRs 0.8 and 0.9: $p= .84$, n.s.).

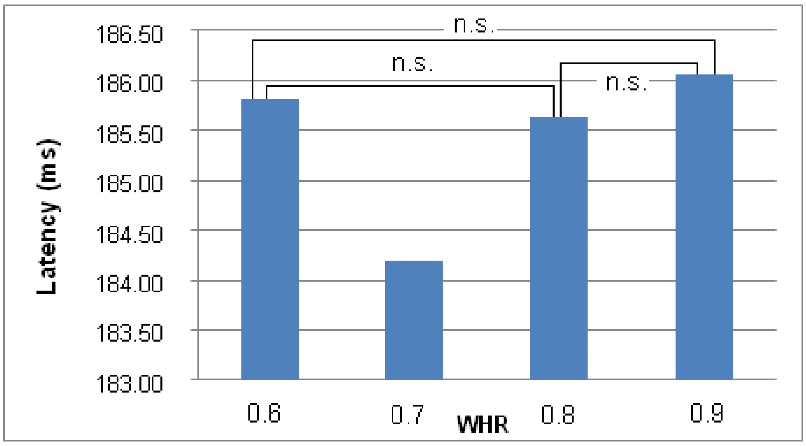

Figure 25. Mean latency (ms) of the N190 component for the WHRs (0.6, 0.7, 0.8 and 0.9). *Note*. n.s. = not significant.

◆ Then, concerning the clothes, it was hypothesized that naked female bodies would elicit an earlier negativity than dressed ones (**H3-2**). A **main effect of Clothes** was found ($F(1,18) = 12.21$, $p=.003$): **naked** female bodies elicited a significantly negativity peak earlier ($M=184.50$ ms, SE= 6.29, see figure 26) than dressed ones ($M=186.34$ ms, SE=16.50), confirming our hypothesis on the N190 latency concerning the clothing.

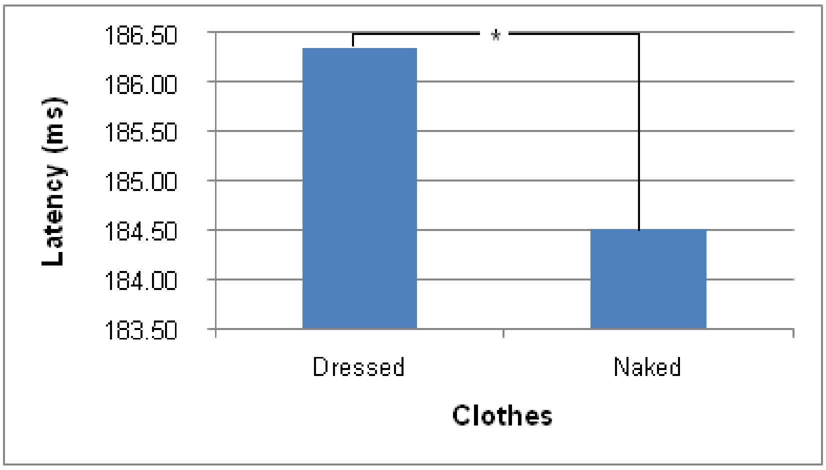

Figure 26. Mean latency (ms) of the N190 component for the clothes (dressed and naked). *Note*. * = significant.

- For the **perspective**, we hypothesized that female bodies seen from back would elicit an earlier negativity than female bodies seen from front (**H4-2**). We did not found a main effect of Perspective (*F*(1,18) =.64, *p*=.43, n.s.). However, descriptive statistics interestingly showed that female bodies seen from back (*M*=185.18 ms, SE=16.51, see appendix XXIV) elicited an earlier peak of negativity than female bodies seen from front (*M*=185.66 ms, SE=16.34), which tend in the direction of our hypothesis but we cannot infer something since the difference is not significant.

- Finally, we wanted to explore whether the combination of naked female bodies with a WHR of 0.7 seen from back, evaluated as the most attractive by participants in the rating task, would elicit an earlier peak on the N190 compared to the other combinations. We did not found an interaction effect of Clothes x Perspective x WHR (*F*(3,54) =.98, *p*=.41, n.s.). However, descriptive statistics showed that naked female bodies with a WHR of 0.7 seen from back (*M*=183.51 ms, SE=6.36, see appendix XXIV) elicited the earliest peak of negativity than the other bodies, which goes in the direction of our hypothesis but, since the difference is not significant, we cannot infer something, like above.

Additional significant results

With the aim of an exploratory study, there are below additional significant results obtained with the ANOVA analysis on the N190 latency.

- **Gender**

A main effect of Gender was found: an significantly earlier peak appeared in **male** participants compared to female participants (*F*(1,18) = 8.92, *p*=.008), with an average latency of 178.40 ms (SE=3.33) and 192.45 ms (SE=3.33), respectively.

- **Electrode**

Finally, a main effect of Electrode was found (*F*(2,36) = 39.39, *p*=.00); the peak of N190 occurred significantly earlier in the pair of electrodes located in the most upper part of the occipital area (A16/A29: *M*=182.23 ms, SE=12.51), followed by the pair of electrodes situated in middle part (A15/A28: *M*=185.51 ms, SE=13.69) and finally by the pair of electrodes situated in the lowest part (A14/A27: *M*=188.52 ms, SE=14.25). A Post hoc Tukey test (see appendix XXVI) showed that all the pairs of electrodes are significantly different from each other (*p*<.05).

4.3.1.3 Summary of the significant results of N190

N190 amplitude

N190 amplitude (> : means greater negativity) ***M* = - 2.16 µV**		
Factors	**Effects**	
WHR	**Main effect**	WHR 0.6 > other WHRs (*p*<.05)
Clothes	**Main effect**	Naked > Dressed (*p*<.05)
Perspective	**Main effect**	Front > Back (*p*<.05)
WHR x Clothes x Perspective	**No interaction effect**	Descriptively: Naked front WHR 0.6 > other combinations
Gender	**Main effect**	Male participants > Female participants (*p*<.05)
Electrode	**Main effect**	Lowest part (A14/A27) > Upper part (A16/A29) (*p*<.05)
WHR x Gender	**Interaction effect**	Male: 0.6 > 0.8 > 0.7 > 0.9 0.6 > 0.7 (*p*<.05) 0.6 > 0.9 (*p*<.05) Female: 0.6 >0.7 >0.8 > 0.9 0.6 > 0.7 (n.s.) 0.6 > 0.9 (*p*<.05)
WHR x Electrode	**Interaction effect**	A16/A29: 0.9 < other WHRs (*p*<.05) A14/A27:0.6 > other WHRs (*p*<.05)
Clothes x Electrode	**Interaction effect**	A14/A27 > A15/A28 > A16/A29 (*p*<.05) for each clothing
Perspective x Electrode	**Interaction effect**	Front > Back for A14/A27 and A15/A28 (*p*<.05) Front = Back for A16/A29 (n.s.)

Table 6. Summary of the significant main results for the amplitude of the N190.

N190 latency

N190 latency (> : means earlier peak of negativity) **158 ms - 217 ms (*M*=185 ms)**		
Factors	**Effects**	
WHR	**Main effect**	WHR 0.7 > other WHRs (*p*<.05)
Clothes	**Main effect**	Naked > Dressed (*p*<.05)
Perspective	**No main effect**	Descriptively: Back > Front
WHR x Clothes x Perspective	**No interaction effect**	Descriptively: Naked back WHR 0.7 > other combinations
Gender	**Main effect**	Male participants > Female participants (*p*<.05)
Electrode	**Main effect**	A16/A29 > A15/A28 > A14/A27 (*p*<.05)

Table 7. Summary of the significant main results for the latency of the N190.

4.3.2 P1

4.3.2.1 Amplitude of P1

The amplitude of the P1 component is on average **+ 5.79 µV** for all conditions combined. Descriptively, the mean positive amplitude is maximal (+ 8.16 µV) on electrode B7 when naked female bodies with a WHR of 0.8 seen from front were presented on the screen and is minimal (+ 3.74 µV) on electrode D32 for dressed female bodies with a WHR of 0.6 seen from front. Since there are 128 conditions (2 x 2 x 4 x 2 x 4), the mean amplitude of the P1 for each of the 128 conditions can be seen in the appendix XXVII. In addition, the mean amplitude in which the WHR, the perspective, the clothes and their interaction are separated can be seen in appendix XXVIII. Below, results obtained with the ANOVA 2 (Clothes) x 2 (Perspective) x 4 (WHR) x 2 (Hemisphere) x 4 (Electrode) will be presented for the P1 amplitude, in order to explore its modulation in link with our conditions (see table 8).

Effect	SS	Degree of Freedom	MS	F	p
WHR	13.28	3	4.43	1.4638	0.234677
Clothes	2.91	1	2.91	0.6520	0.429946
Perspective	0.32	1	0.32	0.1668	0.687806
Gender	339.58	1	339.58	0.5013	0.487985
Hemisphere	623.97	1	623.97	5.1642	0.035550
Electrode	2170.14	3	723.38	32.0466	0.000000
WHR x Gender	32.94	3	10.98	3.6295	0.018492
WHR x Hemisphere	6.37	3	2.12	1.7758	0.162733
WHR x Electrode	2.71	9	0.30	1.3028	0.239143
Clothes x WHR	14.20	3	4.73	1.5529	0.211459
Clothes x Perspective	1.89	1	1.89	0.2949	0.593772
Clothes x Gender	15.75	1	15.75	3.5250	0.076754
Clothes x Hemisphere	0.12	1	0.12	0.0438	0.836531
Clothes x Electrode	4.96	3	1.65	5.3178	0.002768
Perspective x WHR	0.62	3	0.21	0.0683	0.976557
Perspective x Gender	0.05	1	0.05	0.0265	0.872604
Perspective x Hemisphere	7.97	1	7.97	7.6798	0.012588
Perspective x Electrode	9.80	3	3.27	11.1690	0.000008
Hemisphere x Gender	1072.42	1	1072.42	8.8757	0.008040
Hemisphere x Electrode	120.32	3	40.11	5.6471	0.001934
Electrode x Gender	62.62	3	20.87	0.9247	0.435166
WHR x Hemisphere x Gender	3.59	3	1.20	1.0007	0.399658
WHR x Electrode x Gender	2.49	9	0.28	1.1968	0.300361
Clothes x WHR x Gender	7.86	3	2.62	0.8599	0.467574
Clothes x Perspective x Gender	0.00	1	0.00	0.0001	0.993006
Clothes x Hemisphere x Gender	3.40	1	3.40	1.2809	0.272587
Clothes x Electrode x Gender	0.57	3	0.19	0.6130	0.609518
Perspective x WHR x Gender	4.46	3	1.49	0.4924	0.689015

Perspective x Hemisphere x Gender	0.01	1	0.01	0.0096	0.922971
Perspective x Electrode x Gender	0.53	3	0.18	0.6065	0.613654
Hemisphere x Electrode x Gender	26.54	3	8.85	1.2454	0.302351
Clothes x Perspective x WHR	3.04	3	1.01	0.3612	0.781223
Clothes x Perspective x WHR x Gender	0.42	3	0.14	0.0504	0.984866
Clothes x Perspective x Hemisphere	0.04	1	0.04	0.0268	0.871771
Clothes x Perspective x Hemisphere x Gender	0.31	1	0.31	0.2341	0.634341
Clothes x WHR x Hemisphere	0.91	3	0.30	0.3365	0.798981
Clothes x WHR x Hemisphere x Gender	4.22	3	1.41	1.5538	0.211231
Perspective x WHR x Hemisphere	0.82	3	0.27	0.1998	0.896073
Perspective x WHR x Hemisphere x Gender	0.75	3	0.25	0.1838	0.906966
Clothes x Perspective x Electrode	0.81	3	0.27	1.2922	0.286453
Clothes x Perspective x Electrode x Gender	0.14	3	0.05	0.2199	0.882189
Clothes x WHR x Electrode	2.48	9	0.28	1.5036	0.150603
Clothes x WHR x Electrode X Gender	1.64	9	0.18	0.9944	0.446766
Perspective x WHR x Electrode	2.19	9	0.24	1.2033	0.296337
Perspective x WHR x Electrode x Gender	2.87	9	0.32	1.5789	0.125494
Clothes x Hemisphere x Electrode	1.04	3	0.35	1.4182	0.247486
Clothes x Hemisphere x Electrode x Gender	1.52	3	0.51	2.0663	0.115481
Perspective x Hemisphere x Electrode	0.21	3	0.07	0.3518	0.788020
Perspective x Hemisphere x Electrode x Gender	0.33	3	0.11	0.5667	0.639320
WHR x Hemisphere x Electrode	1.00	9	0.11	0.6848	0.721930
WHR x Hemisphere x Electrode x Gender	0.94	9	0.10	0.6420	0.759868
Clothes x Perspective x WHR x Hemisphere	5.06	3	1.69	1.2971	0.284825
Clothes x Perspective x WHR x Hemisphere x Gender	3.55	3	1.18	0.9103	0.442187
Clothes x Perspective x WHR x Electrode	2.54	9	0.28	1.8096	0.070085
Clothes x Perspective x WHR x Electrode x Gender	1.24	9	0.14	0.8852	0.539887
Clothes x Perspective x Hemisphere x Electrode	0.03	3	0.01	0.1887	0.903611
Clothes x Perspective x Hemisphere x Electrode x Gender	0.19	3	0.06	1.1248	0.347230
Clothes x WHR x Hemisphere x Electrode	1.28	9	0.14	1.2166	0.288142
Clothes x WHR x Hemisphere x Electrode x Gender	0.97	9	0.11	0.9217	0.507858
Perspective x WHR x Hemisphere x Electrode	1.94	9	0.22	1.2510	0.267737
Perspective x WHR x Hemisphere x Electrode x Gender	1.95	9	0.22	1.2576	0.263978
Clothes x Perspective x WHR x Hemisphere x Electrode	1.69	9	0.19	1.7091	0.090717
Clothes x Perspective x WHR x Hemisphere x Electrode x Gender	0.45	9	0.05	0.4530	0.903847

Table 8. ANOVA analysis of the P1 amplitude. *Note.* Red numbers are those which are significant (p<.05).

- First, we did not found a main effect of **WHR** ($F(3,54) = 1.46$, p=.23, n.s.). However, we can descriptively see that female bodies with a WHR of **0.7** elicited the greatest positivity (M=5.88 µV, SE=2.89, see appendix XXVIII), followed by the WHR of 0.8 (M=5.83 µV, SE=2.91), then by the 0.9 (M=5.80 µV, SE=2.96) and finally by the 0.6 (M=5.68 µV, SE=2.93).

- Then, concerning the **clothes**, similarly to the WHR, we did not found a main effect of Clothes (*F*(1,18) =.65, *p*=.43, n.s.). Nevertheless, we can descriptively see that **naked** female bodies (*M*=5.83 µV, SE=4.26, see appendix XXVIII) elicited a greater positivity than dressed ones (*M*=5.76 µV, SE=3.99).

- Regarding the **perspective**, again, no main effect was found (*F*(1,18) =.17, *p*=.69, n.s.). Moreover, we can descriptively see that female bodies seen from **front** (*M*=5.81 µV, SE=4.03, see appendix XXVIII) elicited a greater positivity than female bodies seen from back (*M*=5.78 µV, SE=4.21).

- Finally, we did not found an interaction effect of **Clothes x Perspective x WHR** (*F*(3,54) =.36, *p*=.78, n.s.). Moreover, we can descriptively see that naked female bodies with a WHR of 0.8 seen from front (*M*=6.04 µV, SE=1.48, see appendix XXVIII) elicited a greater positivity than the other combinations.

Additional significant results

- **Hemisphere**

A main effect of Hemisphere was found (*F*(1,18) = 5.16, *p*=.04): amplitudes on the **right** hemisphere (*M*=6.29 µV, SE=4.59) were more positive compared to the left hemisphere (*M*=5.30 µV, SE=4.33).

- **Electrode**

A main effect of Electrode was found (*F*(3,54) = 32.05, *p*=.00). Amplitudes on the pair of electrodes **A10/B7** (*M*=6.88 µV, SE=3.13), situated in the most upper part of the occipito-temporal area, and the pair of electrodes **A11/B8** (*M*=6.32 µV, SE=3.44), situated in the middle part of the occipito-temporal area, were more positive compared to the pairs of electrodes A12/B9, situated in the lowest part of the occipito-temporal area (*M*=5.53 µV, SE=3.25), and D32/B10 (*M*=4.44 µV, SE=2.21). A Tukey's Post hoc Test showed that there was no significant difference in terms of amplitude between the pairs of electrodes A10/B7 and A11/B8 (*p*=.17, n.s., see appendix XXIX).

- **WHR x Gender**

An interesting result concerning the WHR concerns the interaction effect of WHR x Gender (*F*(3,54) = 3.63, *p*=.018). Indeed, the P1 component showed a different pattern of activation between male and female participants: in **female** participants, the WHR of **0.8** (*M*=6.25 µV, SE=4.12, see figure 27) elicited the greatest positivity compared to the other WHRs (WHR 0.9: *M*=6.22 µV, SE=4.19; WHR 0.6: *M*=6.11 µV, SE=4.15; WHR 0.7: *M*=6.04 µV, SE=4.09), whereas in **male** participants, the WHR of **0.7** (*M*=5.71 µV, SE=4.09) elicited the biggest positivity compared to the other WHRs (WHR 0.8: *M*=5.39 µV, SE=4.12; WHR 0.9: *M*=5.38 µV, SE=4.19; WHR 0.6: *M*=5.24 µV, SE=4.15). A Post hoc Tukey test revealed that female bodies with WHRs of 0.6 and 0.7 elicited a significantly different amplitude in male participants, in the sense that the WHR of 0.7 elicited a significantly greatest positivity than the WHR of 0.6 (*p*<.05, see appendix XXX). The other comparisons were not significantly different (p>.05, n.s.).

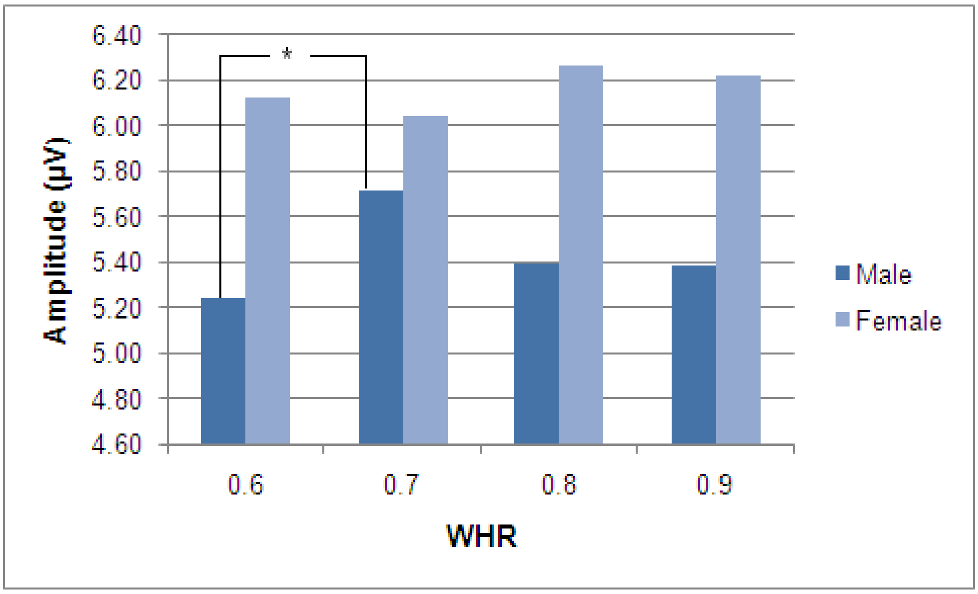

Figure 27. Mean amplitude (µV) of the P1 component for the WHRs (0.6, 0.7, 0.8 and 0.9) by gender. *Note*. * = significant.

- **Clothes x Electrode**

A significant interaction effect was found between Clothes and Electrode ($F(3,54) = 5.32$, $p=.003$). Naked bodies elicited a greater positivity than dressed ones on the pairs of electrodes D32/B10 (naked: *M*=4.52 µV, SE=1.60; dressed *M*=4.35 µV, SE=1.54, see figure 28), A11/B8 (naked: *M*=6.34 µV, SE=2.52; dressed: *M*=6.31 µV, SE=2.35) and A12/B9 (naked: *M*=5.60 µV, SE=2.39; dressed: *M*=5.47 µV, SE=2.22), whereas dressed bodies elicited a greater positivity than naked ones on the pair of electrodes A10/B7 (dressed: *M*=6.91 µV, SE=2.17; naked: *M*=6.85 µV, SE=2.28). A Tukey's Post hoc Test (see appendix XXXI) showed that amplitudes elicited by dressed and naked bodies are significantly different only on the pair of electrodes **D32/B10**, situated in the occipito-temporal area, in the sense that naked bodies elicited a significantly greater activity than dressed ones (*p*<.05).

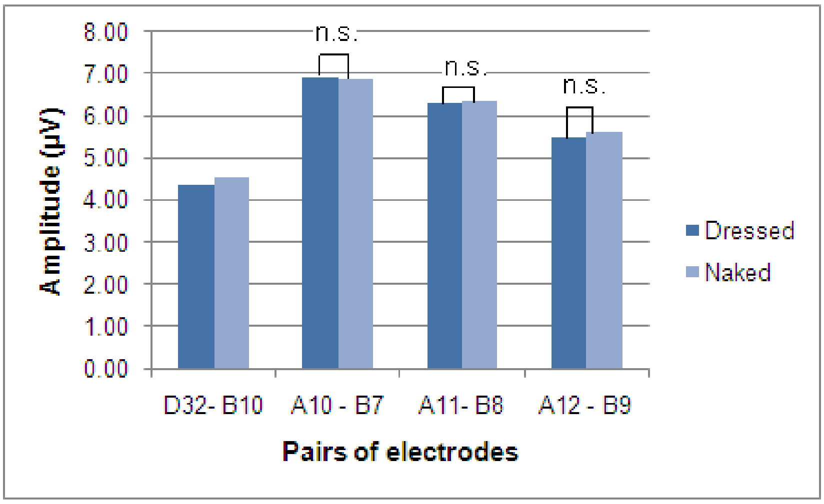

Figure 28. Mean amplitude (µV) of the P1 component. The y-axis represents the amplitude in µV and the x-axis the pairs of electrodes (D32/B10, A10/B7, A11/B8 and A12/B9) for the different clothes (dressed and naked). *Note*. n.s. = not significant.

Perspective x Hemisphere

An interaction effect between Perspective and Hemisphere was also found ($F(1,18) = 7.68$, $p=.013$). The brain activity elicited by bodies seen from front and from back is different in amplitude according to the hemisphere. Indeed, in the right hemisphere, bodies seen from the back ($M=6.33$ µV, see figure 29) elicited a greater amplitude than front bodies ($M=6.24$ µV), whereas the opposite is true in the left hemisphere (front: $M=5.37$ µV; back $M=5.23$ µV). However, a Post hoc Tukey test revealed that differences of amplitude are not significant in both hemispheres (left: $p=.12$, n.s.; right: $p=.42$, n.s., see appendix XXXII).

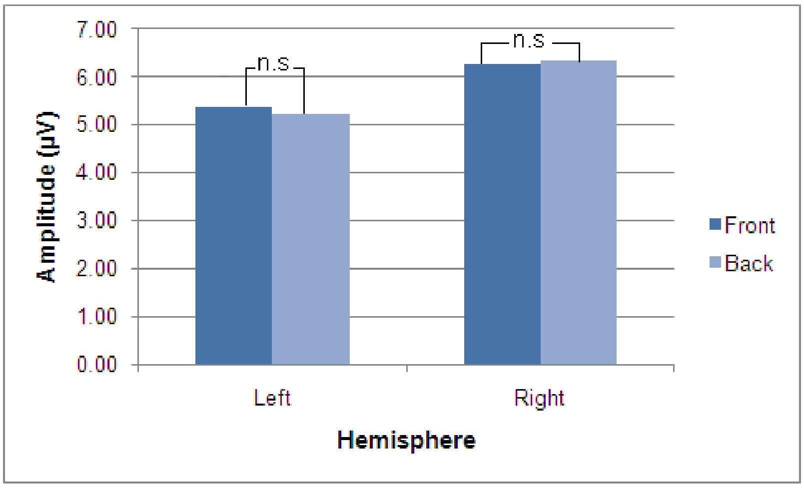

Figure 29. Mean amplitude (µV) of the P1 for both hemispheres and for the perspectives (front and back). *Note*. n.s. = not significant.

Perspective x Electrode

An interaction effect was found between Perspective and Electrode ($F(3,54) = 11.17$, $p=.00001$). On the pair of electrodes A10/B7, bodies seen from the front elicited a greater amplitude than bodies seen from the back (front: $M=6.99$ µV, SE=2.21; back: $M=6.77$ µV, SE=2.24, see figure 30), whereas the opposite is true for the other pairs of electrodes

A11/B8 (back: *M*=6.34 μV, SE=2.52; front: *M*=6.31 μV, SE=2.35), A12/B9 (back: *M*=5.60 μV, SE=2.39; front: *M*=5.47 μV, SE=2.22) and D32/B10 (back: *M*=4.52 μV, SE=1.60; front *M*=4.35 μV, SE=1.54). A Tukey's Post hoc Test revealed that female bodies seen from the **front** elicited a significantly greater positivity than bodies seen from the back only on electrodes **A10/B7** (*p*<.05), whereas there is no significant difference in amplitude for the other pairs of electrodes (D32/B10 front and back: *p*=.88, n.s.; A11/B8 front and back: *p*=.99, n.s.; A12/B9 front and back: *p*=.38, n.s., see appendix XXXIII).

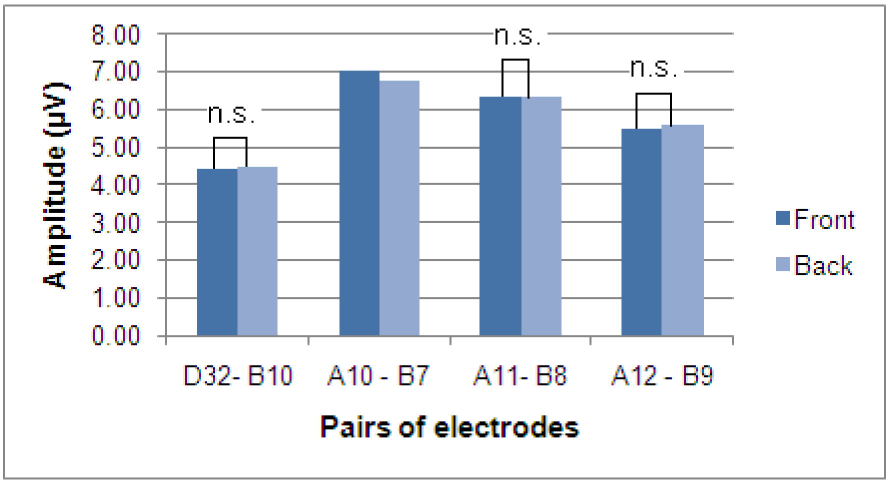

Figure 30. Mean amplitude (μV) of the P1 component. The y-axis represents the amplitude in μV and the x-axis the pairs of electrodes (D32/B10, A10/B7, A11/B8 and A12/B9) for the different perspectives (front and back). *Note*. n.s. = not significant.

- **Hemisphere x Gender**

An interaction effect of Hemisphere x Gender was found (*F*(1,18) = 8.88, *p*=.008). There is a greater amplitude in the **right** hemisphere in **female** participants (*M*=7.30 μV, SE=6.49, see figure 31) compared to their left hemisphere (*M*=5.02 μV, SE=6.13), whereas the opposite is true in the male participants for whom the left hemisphere (*M*=5.58 μV, SE=6.13) is more activated than the right hemisphere (*M*=5.27 μV, SE=6.49). However, a Post hoc Test of Tukey HSD showed that the only significant difference of amplitude is between the right and the left hemispheres in female participants (*p*<.05, see appendix XXXIV).

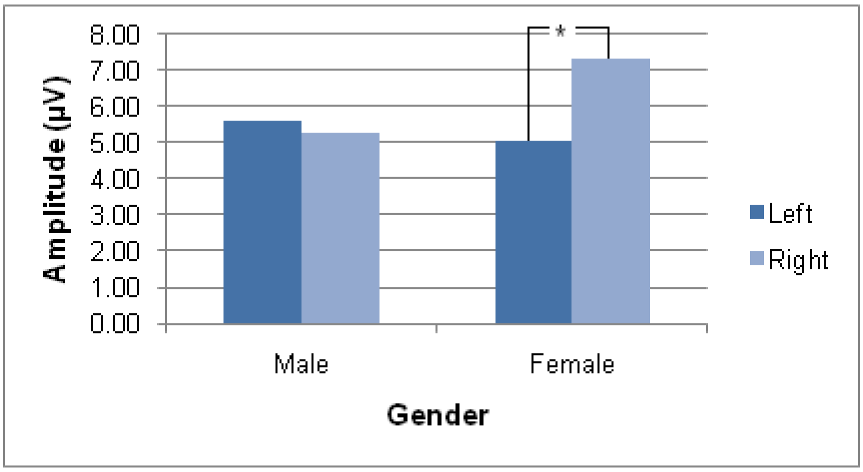

Figure 31. Mean amplitude (µV) of the P1 component. The y-axis represents the amplitude in µV and the x-axis the gender (male and female participants) for both hemispheres (left and right). *Note*. *. = significant.

4.3.2.2 Latency of P1

The P1 component appeared on average between **122 and 162 ms** with mean latency of **144 ms** for all conditions combined. The mean latency was earlier on electrode A10 when naked female bodies with a WHR of 0.9 seen from the back were presented on the screen and was later on electrode A12 for dressed female bodies with a WHR of 0.7 seen from the front. Since there are 128 conditions (2 x 2 x 4 x 2 x 4), the mean latency for the P1 for each of the 128 conditions can be seen in the appendix XXXV. In addition, the mean latency in which the WHR, the perspective, the clothes and their interaction are separated can be seen in appendix XXXVI. Below, results obtained with the ANOVA 2 (Clothes) x 2 (Perspective) x 4 (WHR) x 2 (Hemisphere) x 4 (Electrode) on the P1 latency will be presented (see table 9).

Effect	SS	Degree of Freedom	MS	F	p
WHR	27	3	9	0.109	0.954431
Clothes	4306	1	4306	44.041	0.000003
Perspective	118	1	118	2.908	0.105333
Gender	1570	1	1570	0.172	0.683473
Hemisphere	8	1	8	0.008	0.929219
Electrode	1103	3	368	2.285	0.089168
WHR x Gender	150	3	50	0.599	0.618614
WHR x Hemisphere	35	3	12	0.236	0.871172
WHR x Electrode	94	9	10	0.747	0.665491
Clothes x WHR	651	3	217	1.760	0.165778
Clothes x Perspective	3	1	3	0.051	0.823387
Clothes x Gender	421	1	421	4.305	0.052614
Clothes x Hemisphere	122	1	122	1.504	0.235871
Clothes x Electrode	21	3	7	0.294	0.829688

Perspective x WHR	146	3	49	0.603	0.616123
Perspective x Gender	46	1	46	1.139	0.299919
Perspective x Hemisphere	545	1	545	3.361	0.083338
Perspective x Electrode	22	3	7	0.400	0.753461
Hemisphere x Gender	4	1	4	0.004	0.948315
Hemisphere x Electrode	279	3	93	0.988	0.405309
Electrode x Gender	128	3	43	0.265	0.850543
WHR x Hemisphere x Gender	77	3	26	0.521	0.669820
WHR x Electrode x Gender	137	9	15	1.085	0.376950
Clothes x WHR x Gender	680	3	227	1.839	0.151123
Clothes x Perspective x Gender	84	1	84	1.592	0.223139
Clothes x Hemisphere x Gender	0	1	0	0.004	0.952124
Clothes x Electrode x Gender	82	3	27	1.149	0.337903
Perspective x WHR x Gender	198	3	66	0.816	0.490665
Perspective x Hemisphere x Gender	30	1	30	0.185	0.671829
Perspective x Electrode x Gender	58	3	19	1.082	0.364574
Hemisphere x Electrode x Gender	32	3	11	0.114	0.951606
Clothes x Perspective x WHR	107	3	36	0.505	0.680548
Clothes x Perspective x WHR x Gender	158	3	53	0.745	0.530081
Clothes x Perspective x Hemisphere	88	1	88	1.231	0.281842
Clothes x Perspective x Hemisphere x Gender	2	1	2	0.022	0.884046
Clothes x WHR x Hemisphere	1	3	0	0.005	0.999545
Clothes x WHR x Hemisphere x Gender	328	3	109	1.933	0.135245
Perspective x WHR x Hemisphere	15	3	5	0.056	0.982500
Perspective x WHR x Hemisphere x Gender	282	3	94	1.076	0.367031
Clothes x Perspective x Electrode	139	3	46	4.371	0.007929
Clothes x Perspective x Electrode x Gender	28	3	9	0.868	0.463424
Clothes x WHR x Electrode	161	9	18	1.556	0.132746
Clothes x WHR x Electrode X Gender	112	9	12	1.083	0.378305
Perspective x WHR x Electrode	170	9	19	1.564	0.130223
Perspective x WHR x Electrode x Gender	135	9	15	1.245	0.271112
Clothes x Hemisphere x Electrode	34	3	11	0.640	0.592287
Clothes x Hemisphere x Electrode x Gender	133	3	44	2.470	0.071716
Perspective x Hemisphere x Electrode	19	3	6	0.357	0.784226
Perspective x Hemisphere x Electrode x Gender	23	3	8	0.422	0.738313
WHR x Hemisphere x Electrode	119	9	13	0.671	0.734440
WHR x Hemisphere x Electrode x Gender	97	9	11	0.546	0.839408
Clothes x Perspective x WHR x Hemisphere	206	3	69	0.860	0.467264
Clothes x Perspective x WHR x Hemisphere x Gender	199	3	66	0.830	0.483193
Clothes x Perspective x WHR x Electrode	108	9	12	1.089	0.373646
Clothes x Perspective x WHR x Electrode x Gender	64	9	7	0.643	0.759206
Clothes x Perspective x Hemisphere x Electrode	5	3	2	0.149	0.929984
Clothes x Perspective x Hemisphere x Electrode x Gender	87	3	29	2.482	0.070692
Clothes x WHR x Hemisphere x Electrode	78	9	9	0.766	0.647509
Clothes x WHR x Hemisphere x Electrode x Gender	151	9	17	1.474	0.161445

Perspective x WHR x Hemisphere x Electrode	60	9	7	0.620	0.778879
Perspective x WHR x Hemisphere x Electrode x Gender	38	9	4	0.395	0.935964
Clothes x Perspective x WHR x Hemisphere x Electrode	110	9	12	0.867	0.555861
Clothes x Perspective x WHR x Hemisphere x Electrode x Gender	164	9	18	1.293	0.244296

Table 9. ANOVA analysis of the latency of the P1. *Note.* Red numbers are those which are significant (p<.05).

◆ First, we did not found a main effect of **WHR** (F(3,54) =.11, p=.95, n.s.). However, since it is an exploratory study, it is interesting to descriptively see that the WHR of 0.9 elicited an earlier peak of positivity (M=144.07 ms, SE=10.71, see appendix XXXVI), followed by the WHR of 0.6 (M=144.15 ms, SE=11.49), then by the 0.7 (M=144.29 ms, SE=10.70) and finally by the 0.8 (M=144.33 ms, SE=10.41). Nevertheless, we cannot conclude something with these descriptive statistics since differences are not significant.

◆ Then, a **main effect of Clothes** was found (F(1,18) = 44.04, p=.00), explained by the fact that **naked** female bodies (M=142.92 ms, SE= 5.66) elicited on average a significantly earlier peak of positivity than dressed female bodies (M=145.51 ms, SE=14.72, see figure 32).

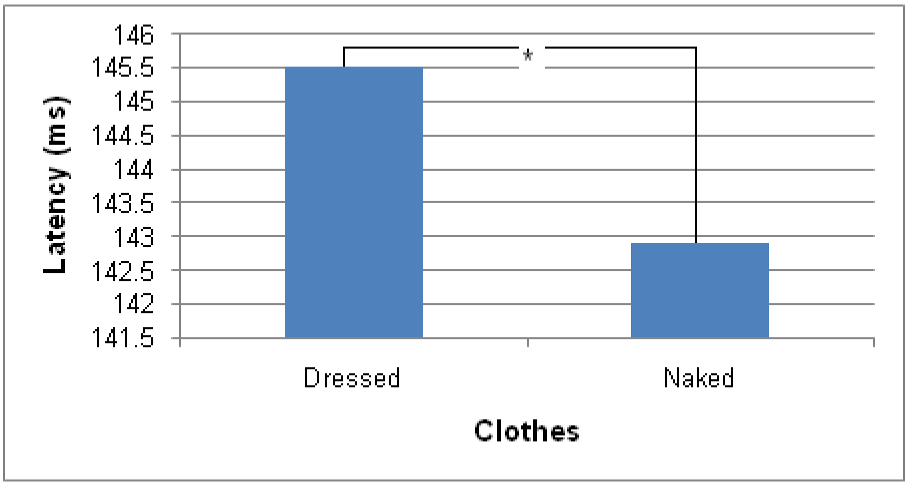

Figure 32. Mean latency (ms) of the P1 component for the clothes (dressed and naked). The y-axis represents the latency in ms and the x-axis the clothes (dressed and naked). *Note*. * = significant.

◆ For the **perspective**, similarly to the WHR, we did not found a main effect of Perspective (F(1,18) = 2.91, p=.11, n.s.) on the latency of the P1. However, we can descriptively see that female bodies seen from the back (M=143.99 ms, SE=15.59, see appendix XXXVI) elicited an earlier peak of positivity than female bodies seen from the front (M=144.42 ms, SE=14.69).

◆ Finally, we did not found an interaction effect of **Clothes x Perspective x WHR** (F(3,54) = .51, p=.68, n.s.). In addition, descriptive statistics revealed that naked female bodies with a WHR of 0.9 seen from the front (*M*=141.95 ms, SE=5.35, see appendix XXXVI) elicited an earlier peak of positivity than other female bodies.

Additional significant results

◆ **Clothes x Perspective x Electrode**

An interaction effect of Clothes x Perspective x Electrode was finally found ($F(3,54) = 4.37$, $p=.01$), explained by the fact that for all pairs of electrodes, when female bodies are dressed, those seen from the back (D32/B10: *M*=145.65 ms, SE=5.49; A10/B7: *M*=144.46 ms, SE=5.47; A11/B8: *M*=145.23 ms, SE=5.41; A12/B9: *M*=145.70 ms, SE=5.70, see figure 33) elicited an earlier response than those seen from front (D32/B10: *M*=145.91 ms, SE=4.84; A10/B7: *M*=144.58 ms, SE=5.45; A11/B8: *M*=145.98 ms, SE=5.42; A12/B9: *M*=146.54 ms, SE=5.43). Conversely, for naked bodies, pairs of electrodes D32/B10 and A10/B7 elicited an earlier response when female bodies are seen from the front (D32/B10: *M*=143.63 ms, SE=5.73; A10/B7: *M*=142.45 ms, SE=5.75) than from the back (D32/B10: *M*=143.05 ms, SE=6.06; A10/B7: *M*=141.15 ms, SE=6.09), whereas on pairs of electrodes A11/B8 and A12/B9, female bodies seen from the back (A11/B8: *M*=142.96 ms, SE=5.77; A12/B9: *M*=143.75 ms, SE=5.78) elicited an earlier response than those seen from front (A11/B8: *M*=142.61 ms, SE=5.36; A12/B9: *M*=143.69 ms, SE=5.39).

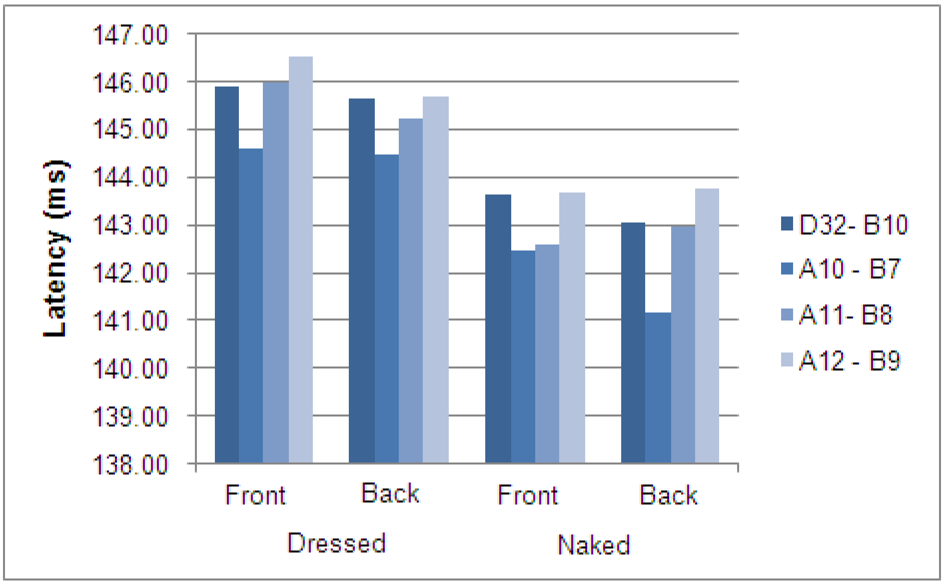

Figure 33. Mean latency (ms) of the P1 for the pairs of electrodes (D32/B10, A10/B7, A11/B8 and A12/B9) and for the different clothes (dressed and naked) and perspectives (front and back).

4.3.2.3. Summary of the significant results of P1

P1 amplitude

P1 amplitude (> : means greater positivity) ***M* = + 5.79 µV**		
Factors	**Effects**	
WHR	**No main effect**	Descriptively: WHR 0.7 > 0.8 > 0.9 > 0.6
Clothes	**No main effect**	Descriptively: Naked > Dressed
Perspective	**No main effect**	Descriptively: Front >Back
WHR x Clothes x Perspective	**No interaction effect**	Descriptively: Naked front WHR 0.8 > other combinations
Hemisphere	**Main effect**	Right > Left (p<.05)
Electrode	**Main effect**	A10/B7 = A11/B8 (p=.16, n.s.) > A12/B9 (p<.05) > D32/B10 (p<.05)
WHR x Gender	**Interaction effect**	Male: 0.7 > 0.8 > 0.9 > 0.6 0.7 > 0.6 (p<.05) Female: 0.8 > 0.9 > 0.6 > 0.7 (n.s.)
Clothes x Electrode	**Interaction effect**	Naked > Dressed: D32/B10 (p<.05) A11/B8 (n.s.) A12/B9 (n.s.) Dressed > Naked: A10/B7 (n.s.)
Perspective x Hemisphere	**Interaction effect**	Left hemisphere: Front > Back (n.s.) Right hemisphere: Back > Front (n.s.)
Perspective x Electrode	**Interaction effect**	Front > Back: A10/B7 (p<.05) Back > Front: A11/B8 (n.s.) A12/B9 (n.s.) D32/B10 (n.s)
Gender x Hemisphere	**Interaction effect**	Male: Left > Right (n.s) Female: Right > Left (p<.05)

Table 10. Summary of the significant main results for the amplitude of the P1.

P1 latency

P1 latency (> : means earlier peak of positivity) **122 ms – 162 ms (*M* =144 ms)**		
Factors	**Effects**	
WHR	**No main effect**	Descriptively: WHR 0.9 > 0.6 > 0.7 > 0.8
Clothes	**Main effect**	Naked > Dressed (p<.05)
Perspective	**No main effect**	Descriptively: Back > Front
WHR x Clothes x Perspective	**No interaction effect**	Descriptively: Naked front WHR 0.9 > other combinations
Clothes x Perspective x Electrode	**Interaction effect**	Dressed: All pairs of electrodes : Back > Front Naked: D32/B10 and A10/B7: Front > Back A11/B8 and A12/B9: Back > Front

Table 11. Summary of the significant main results for the latency of the P1.

4.4 Discussion

Having performed the behavioral experiment in order to investigate which physical characteristics are evaluated as the most attractive in a rating task, the **aim** of the electrophysiological experiment was to study at a cerebral level the time course of brain activation associated with realistic female bodies used previously in the behavioral experiment. We wanted to explore the underlying cognitive and physiological mechanism of biologically relevant sexual stimuli and to investigate whether the N190 and P1 components were modulated by the conditions evaluated as more physically attractive in the previous behavioral experiment (i.e., WHR of 0.7, naked, and back-view). In addition to this main goal, we were also interested in exploring other interesting results concerning the modulations associated with the presentation of clothing and the viewing perspective of realistic female bodies varying in their WHR.

In this section, we start by discussing the main results obtained during this experiment and the links to relevant literature. Since the design of the experiment involved many conditions, we will focus on the main outcomes. The P1 will be first discussed, following which the main results of the N190 will be considered. We will also try to compare the main results obtained in the two experiments to link the behavioral and cerebral responses. Then, the contributions of this study will be presented and comparisons made to previous studies. After presenting the limitations of this study, some suggestions for future research will be outlined. The remarks pertaining to the behavioral experiment are also valid for this experiment, since we used the same stimuli and a similar population.

With respect to the results, we observed the P1 and N190 components, as expected. First, the **P1** occurred between **122 ms and 162 ms** after stimulus onset and peaked at **144 ms** on average, with mean amplitude of **+ 5.79 µV** for all conditions combined. The P1 amplitude was maximal in the right hemisphere on the superior part of the lateral occipital area, when naked bodies with a WHR of 0.8 seen from front were presented. This time course is consistent with the findings of Thierry et al. (2006) that revealed a positive peak at 134 ms after stimulus onset in the parieto-occipital area. Next, the **N190** was observed between **158 ms and 217 ms** after stimulus onset, with mean peak at **185 ms** and mean amplitude of **- 2.16 µV**. The N190 amplitude was maximal in the right hemisphere on the inferior part of the occipital cortex, when naked bodies with a WHR of 0.6 seen from front were presented. This time course is consistent with the study of Thierry et al. (2006) that revealed a peak latency of the N190 at 190 ms after the presentation of photographs of clothed bodies with maximal amplitude in the parieto-occipital area, and also confirms the study of Pourtois et al. (2007) that had similar results. Consequently, we found that the processing of bodies occurs very early, during the first 200 ms.

Concerning more specifically the positive component **P1**, we found that its **amplitude** was modulated by the **WHR**. Indeed, investigating the modulation of the P1 amplitude by the WHR and also by **gender** of the observer, we found an interesting result: in **female** participants, the WHR of **0.8** elicited a greater positivity compared to the other WHRs, whereas in **male** participants, the WHR of **0.7** elicited a greater positivity compared to the other WHRs. Thus, in the male group, the ratio preferred in the behavioral experiment by all participants (i.e., WHR of 0.7) likewise elicited the greatest positivity, whereas the same is not true in the female group since for them the WHR of 0.8 elicited the greatest positivity and not the WHR of 0.7. Consequently, the P1 seems sensitive to the WHR and shows a different pattern of cerebral activation between genders. These results can be explained by the fact that many virtues are attributed to a WHR of 0.7, such the female health and fertility and thus an increase of reproductive success for the men. By consequence, higher cerebral activation in men for women with a WHR of 0.7 reflects a response to perceived female health and fertility.

Next, the **latency** of **P1** was modulated by the **clothing**, showing that **naked** bodies elicited an earlier peak than dressed ones. Then, investigating the modulation of its **amplitude** by clothes and electrodes, we found that in the more anterior part of the occipito-temporal area, naked bodies elicited a significantly greater positivity than dressed ones, whereas in the more posterior parts of this area, amplitudes elicited by naked and dressed bodies were not significantly different. This result shows that the clothing processing occurs in more anterior parts of the occipito-temporal area, since these parts seem particularly sensitive in the detection of presence or absence of clothes.

Then, the **P1** **amplitude** was also modulated by the viewing **perspective** of the female bodies with respect to the hemispheres and to the electrodes localization. Indeed, in the **right** hemisphere of participants, female bodies seen from the **back** tend to elicit a greater positivity than those seen from the front, whereas the opposite occurs in the **left** hemisphere, showing a different pattern of activation for this category in both hemispheres, although differences were not significant. Moreover, in the most dorsal part of the lateral occipital area, the brain activity was significantly greater when female bodies from **front** were presented to participants than when female bodies were seen from the back, whereas the cerebral activity was not significantly different between both conditions in areas situated more anterior and inferior. Thus, it seems that the processing of the viewing perspective occurs in more dorsal parts of the lateral occipital area, since this region was particularly sensitive in the detection of the viewing perspective of the body.

Moreover, for this **positive** component, the **right** hemisphere was more activated in terms of amplitude than the left hemisphere. This greater right-lateralization is consistent with the findings of Costa et al. (2003) and Kovacs et al. (2006). More specifically, this activation depended on the **gender** of the participant. The right hemisphere was significantly more activated than the left hemisphere in the female group, whereas the opposite is true for the male group, but was not significant, as if there was a different pattern of activation between the genders. Thus, **both hemispheres** are identically activated in **male** participants when viewing female bodies.

Having discussed the main significant results concerning the P1, we will now expose conditions that significantly modulated the negative deflection. First, the **amplitude** and the **latency** of the **N190** were modulated by the **WHR**; female bodies with a WHR of **0.6** elicited a greater negativity than bodies with the other WHRs, whereas we expected that the WHR of 0.7 will elicited the greatest negativity, since this ratio was evaluated as the most attractive in the behavioral experiment. However, even if this result and our expectation on the N190 amplitude are not identical, we can see that both converge, since the WHRs of 0.6 and 0.7 are both low WHRs. Moreover, female bodies with a WHR of **0.7** elicited an earlier peak of negativity than the other WHRs. Thus, low WHRs require a more specific processing than the other WHRs - a greater negative response for the WHR of 0.6 and an earlier negative response for the WHR of 0.7-. This specific processing could be enhanced by selection since low WHRs are synonymous with female health and fertility, ensuring male reproductive success and thus the identification of low feminine WHRs is related to the survival of our species. Indeed, men attracted by women with a **low WHR** will have higher reproductive success and this partner preference would be encouraged by natural selection. Moreover, according to Platek and Singh (2010), bodies with a WHR of 0.7 specifically activated areas involved in reward processing, also confirming that bodies with a WHR of 0.7 involve specific processing, since the WHR of 0.7 is a crucial cue for the female health and reproductive potential.

More specifically, the **N190** response related to the different WHRs varied in amplitude according to the electrodes localization. Indeed, in the most dorsal part of the occipital area, female bodies with a WHR of **0.9** elicited a significantly smaller negativity than the other WHRs, and this ratio was evaluated as the least attractive in the behavioral task. Since the N190 response developed significantly earlier for this latter area than for more inferior areas, we may postulate that the most dorsal areas indicate, by a smaller negativity and earlier cerebral response, that a WHR of 0.9 is not linked to reproductive success, as compared to lower WHRs. Conversely, areas situated in the most inferior part of the occipital cortex, registering the latest peak of amplitude compared to areas situated in the more dorsal part, elicited a greater response to the WHR of **0.6** than the other WHRs.

Furthermore, similarly to the P1 amplitude, there was an observer **gender** difference in the **N190 amplitude** related to the different **WHRs**. For both genders, the WHR of 0.6

elicited the greatest negativity and the WHR of 0.9 the smallest negativity, showing a similarity between both genders, but the raking in terms of amplitude between these two extremes was different between genders. Indeed, in the **female** group, the WHR of 0.6 elicited a greater response than the WHR of 0.7, followed by the 0.8 and finally the 0.9, whereas in the **male** group, the WHR of 0.6 also elicited the greatest negativity but was followed by the WHR of 0.8, then by the 0.7, and finally by the 0.9. Moreover, similarly to the P1 amplitude, in the female group, the cerebral responses to the WHRs of 0.6 and 0.7 are not significantly different in terms of amplitude, whereas they are significantly different in the male group. Thus, bodies with WHRs of 0.6 or 0.7 are processed in different ways in male participants, but not in female participants in terms of amplitude, showing that men process differently the low WHRs compared to women.

Consequently, the amplitude and the latency of the N190 are sensitive to the WHR and the P1 amplitude, as discussed above, also shows a modulation of the cerebral activity related to the WHR according to gender. For the P1, the greatest positivity varies according to the gender of the observer: in men, the WHR of 0.7 elicited the greatest positivity, whereas in women, it was the WHR of 0.8. On the other hand, the greatest negativity is elicited by the WHR of 0.6, irrespective of the gender.

Then, the **amplitude** and the **latency** of the **N190** were also modulated by the **clothes**. **Naked** bodies elicited a significantly earlier peak and a greater negativity than dressed ones. This shows that, in addition to being sensitive to the WHR, the latency and the amplitude of the N190 are also sensitive to the clothing.

Consequently, naked female bodies involved a specific processing, since they modulate the electrical components P1 and N190. Naked bodies elicited a significantly earlier peak of positivity, and an earlier and greater peak of negativity. These findings are consistent with the behavioral results, where naked bodies were evaluated as more attractive than dressed ones, and thus confirms that the mechanism evaluating these body parameters is instinctive, since nudity is related to sexuality and reproduction act. This study, demonstrating the difference in the cerebral activity between viewing dressed and naked bodies, provides more specific information on the treatment of naked bodies than the study of Costa et al. (2003) for instance, where naked bodies were compared only to neutral objects and not to dressed bodies.

Finally, the **N190** was significantly modulated by the body **perspective**; a greater negativity was generated when participants viewed bodies seen from **front** than for bodies seen from the back, whereas the back view was evaluated as more attractive than the front view in the behavioral experiment. This last observation shows a difference between the behavioral and the cerebral levels. In this electrophysiological experiment, we may postulate that, even if the behavioral preference was for the back view, the more innate physiological mechanism involves a stronger cerebral response for front body view, since the genitals are localized on the front part of the bodies, an instinctive mechanism related to the reproduction. We also suggest that participants in the behavioral experiment were constrained to rate naked women, and the mechanism related to this discomfort may have distorted the rating of the stimuli, by not allowing them to rate naked stimuli in a more attractive way. Further, bodies seen from the front elicited a greater amplitude than bodies seen from the back on the middle and inferior parts of the occipital area, whereas there was no significant difference in amplitude in the more dorsal area, showing that the processing of viewing perspective occurs particularly in these first areas, since they were specifically sensitive to the body perspective.

Another interesting result concerns the **gender** of the observer. In the behavioral task, there was no significant difference between the attractiveness ratings by both genders, and it was argued that both genders shared the same perception of physical attractiveness. However, in the electrophysiological experiment, we found differences between genders in the cerebral response. Indeed, there was a difference between genders on the **N190**: the cerebral response occurred earlier and was greater in **male** than in female participants. Our results are consistent with the study of Costa et al. (2003), which also found that male participants had a greater cerebral activity as compared to female participants when viewing nudes in front view. These results show that female bodies are biologically relevant stimuli for men, since they are related to mate selection and reproductive success. Even if in the behavioral experiment, both genders shared the same attractiveness rating, at a cerebral level, the brain response is different between genders, and occurs earlier and with higher activity in men. Because of the high reproductive potential of the men, they are particularly sensitive to the physical appearance, compared to women. This could be linked to the evolutionary theory of sexual selection, stating that psychological mechanisms sensitive to female bodily features in the evaluation of the partner quality evolved in men, since indications conveyed by some of these features were reliable cue of reproductive success (Singh, 2002).

To summarize, the P1 occurred between 122 and 162 ms after stimulus onset, with a mean latency of 144 ms, whereas the N190 component appeared between 158 and 217 ms, with a mean latency of 185 ms, in the occipital cortex. The processing of the female body shape and secondary sexual characteristics thus occurs very early, during the first 200ms of viewing, in both heterosexual men and women. Moreover, we found that the N190 and P1 components were sensitive to the categories related to our realistic female bodies. The N1, for which an inversion effect was found and reflecting the structural body processing (Stekelenburg & De Gelder, 2004), seems more sensitive to the whole body shape, whereas the P1, for which no inversion effect was previously found (Righart & De Gelder, 2007), seems more sensitive to body features like the WHR. Such electrical modulations could then be a way to indicate crucial information concerning the fertility and health of women, since factors of attractiveness, and especially the WHR, are reliable cues. It thus confirms that these early components are evolutionary “prepared” mechanisms (Costa et al., 2003). The detection of bodies is fast because of evolutionary pressure, evolving specialized neuronal mechanisms (Gliga & Dehaene-Lambertz, 2005). Thus, this study adds to the knowledge concerning body shape processing and constitutes a first step in the investigation of physical attractiveness at a cerebral level, since no other study has examined this topic. This experiment yields important results for the characterization of the cerebral activity related to perceived female bodies and confirms that the body feature processing is an innate and instinctive mechanism, especially in men, but also in women.

After describing the main outcomes and their implications, we can now evaluate the **advantages and limitations** of this electrophysiological experiment. We used 128 **electrodes,** providing a more precise detection and measurements of the brain activity than the 64 electrodes usually used (Gliga & Dehaene-Lambertz, 2005). Then, concerning the **stimuli** used for this experiment, in addition to the advantages discussed in the behavioral experiment, another positive point is that the faces were blurred, not only in order to eliminate the influence of facial attractiveness as in the behavioral experiment, but also to avoid any cerebral response related to faces. However, we can ask ourselves whether, even if the faces were blurred, a possible influence occurred. For instance, Cox et al. (2004, cited by Thierry et al., 2006) showed with an fMRI study that face-selective areas can be activated even if the faces are blurred. Furthermore, methodologically, we may suggest that the analyses would have been easier by measuring the Global Field Power (**GFP**), which is the standard deviation of all electrodes at a given time, and represents a reference-independent measure of the response strength (Murray, Brunet & Michel, 2008). This technique allows a global estimation of the amplitude at a given time in spite of the small variations of peak latencies between different electrode localizations (Pourtois, Delplanque, Michel & Vuilleumier, 2008).

We can finally discuss some **future perspectives** for this electrophysiological experiment. First, since we previously discussed that the age has no significant effect on the attractiveness evaluation at a behavioral level (George et al., 2006, cited by Swami et al., 2007b), it would be interesting to investigate whether the **age** of participants has an influence in the way that these categories modulate the cerebral activity, since participants involved in this study were young, at the age where mate choice is crucial. Then, it could also be interesting to investigate whether there is a different pattern of activation in specific populations when viewing female bodies, such as among persons suffering from **eating disorders** to better understand their underlying mechanisms, or **homosexuals and lesbians** as compared to heterosexuals, since the cerebral process underlying sexual orientation is not yet well known (Paul et al., 2008).

5. Overall conclusion

In conclusion, these behavioral and electrophysiological experiments yield important results regarding the relevant characteristics of perceived sexual attractiveness of realistic female bodies at a behavioral and cerebral level. To the best of our knowledge, no study had investigated the characteristics of the physical attractiveness in terms of body attractiveness in heterosexual women and men at behavioral and electrophysiological levels using realistic female bodies with different clothing, different viewing perspective and depicting 4 WHRs. This experiment was thus an exploratory study for the field, and results obtained with this pilot study must encourage investigating the field of physical attractiveness in this direction.

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Appendixes

Table of contents

Appendix I: Behavioral experiment: main demographic details of the participants

	Sexual Orientation Questionnaire				Personal information			
No. participants	Q. 1	Q. 2	Q. 3	Q. 4	Age	Glasses	Laterality	Size
1	1	2	1	1	26	no	right	M
2	1	5	1	1	22	no	right	M
3	2	4	1	1	22	no	right	L
4	1	3	1	1	21	no	right	M
5	1	3	1	1	60	yes	right	M
6	1	3	1	1	22	yes	right	M
7	1	2	1	1	19	no	left	M
8	1	4	1	1	25	yes	right	n/a
9	1	6	1	1	32	yes	ambidextrous	n/a
10	1	6	1	1	26	yes	right	n/a
11	1	2	1	1	24	no	right	M
12	1	1	1	1	26	yes	right	S
13	1	4	1	1	45	no	ambidextrous	n/a
14	1	n/a	1	1	43	yes	right	n/a
15	1	2	1	1	30	yes	right	n/a
16	1	n/a	1	1	38	yes	right	n/a
17	1	7	1	1	28	yes	right	n/a
18	1	5	1	1	27	yes	right	L
19	1	5	1	1	37	yes	right	n/a
20	1	2	1	1	26	no	right	L
21	2	3	1	1	23	no	right	M
22	1	3	1	1	20	no	right	M
23	1	3	1	1	25	no	right	M
24	1	1	1	1	22	yes	right	S
25	2	4	1	1	22	yes	right	L
26	1	3	1	1	23	yes	right	M
27	1	6	1	1	26	n/a	right	n/a
28	1	3	1	1	29	n/a	right	n/a
29	1	5	1	1	29	n/a	right	n/a
30	1	n/a	1	1	33	n/a	right	n/a
31	1	5	1	1	26	no	right	n/a
32	1	4	1	1	27	no	right	n/a
33	1	6	1	1	28	yes	right	n/a
34	1	4	1	1	35	no	right	n/a
35	1	5	1	1	25	n/a	right	n/a
36	2	1	1	1	25	yes	right	n/a
37	1	5	1	1	27	yes	left	n/a
38	1	4	1	1	24	yes	right	M
39	1	3	1	1	24	yes	right	S
40	1	2	1	1	27	yes	right	L
					Mean :28			

Q. 1:

- 1 = exclusively heterosexual
- 2 = predominantly heterosexual, only occasionally homosexual

Q. 2:

- 1 = 0 opposite-sex sexual partner
- 2 = 1 opposite-sex sexual partners
- 3 = 3-5
- 4 = 6-10
- 5 = 11-20
- 6 = 21-50
- 7 = over 50

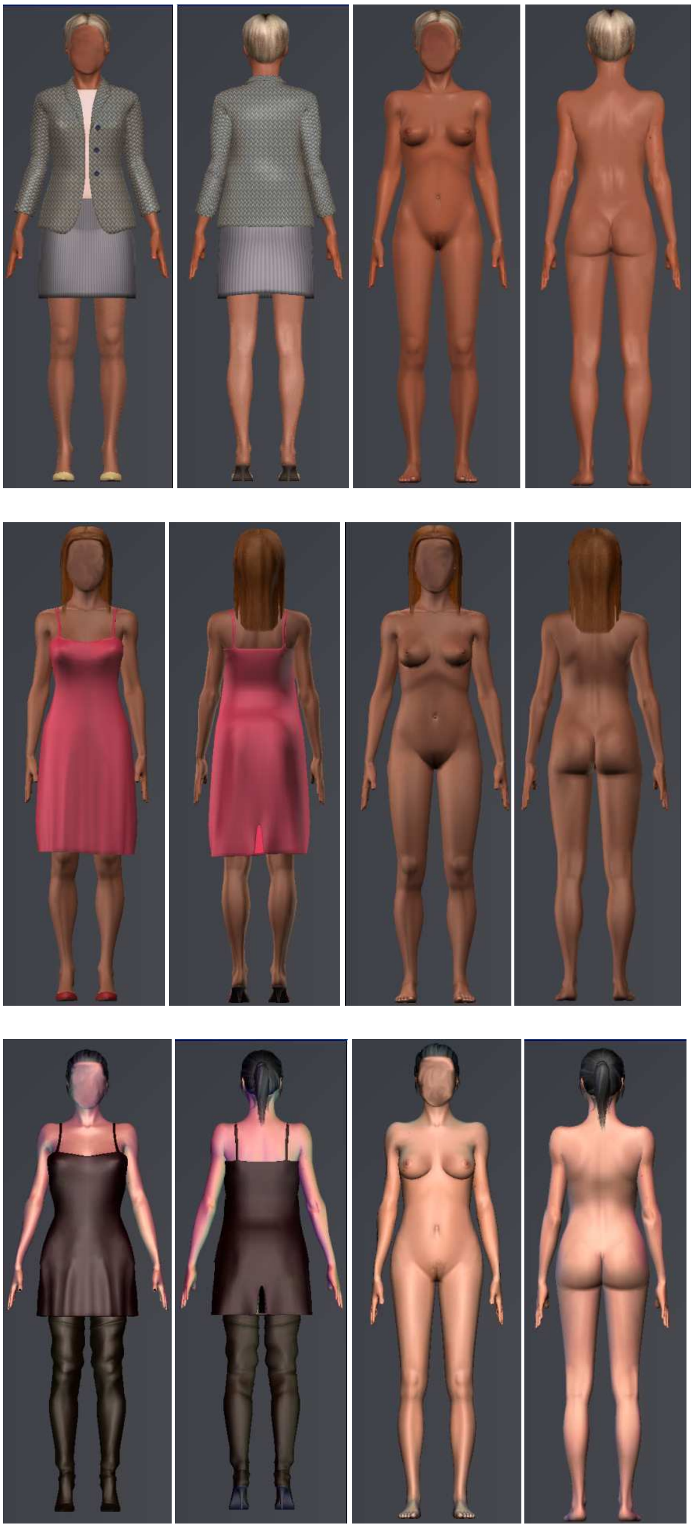
Q. 3:

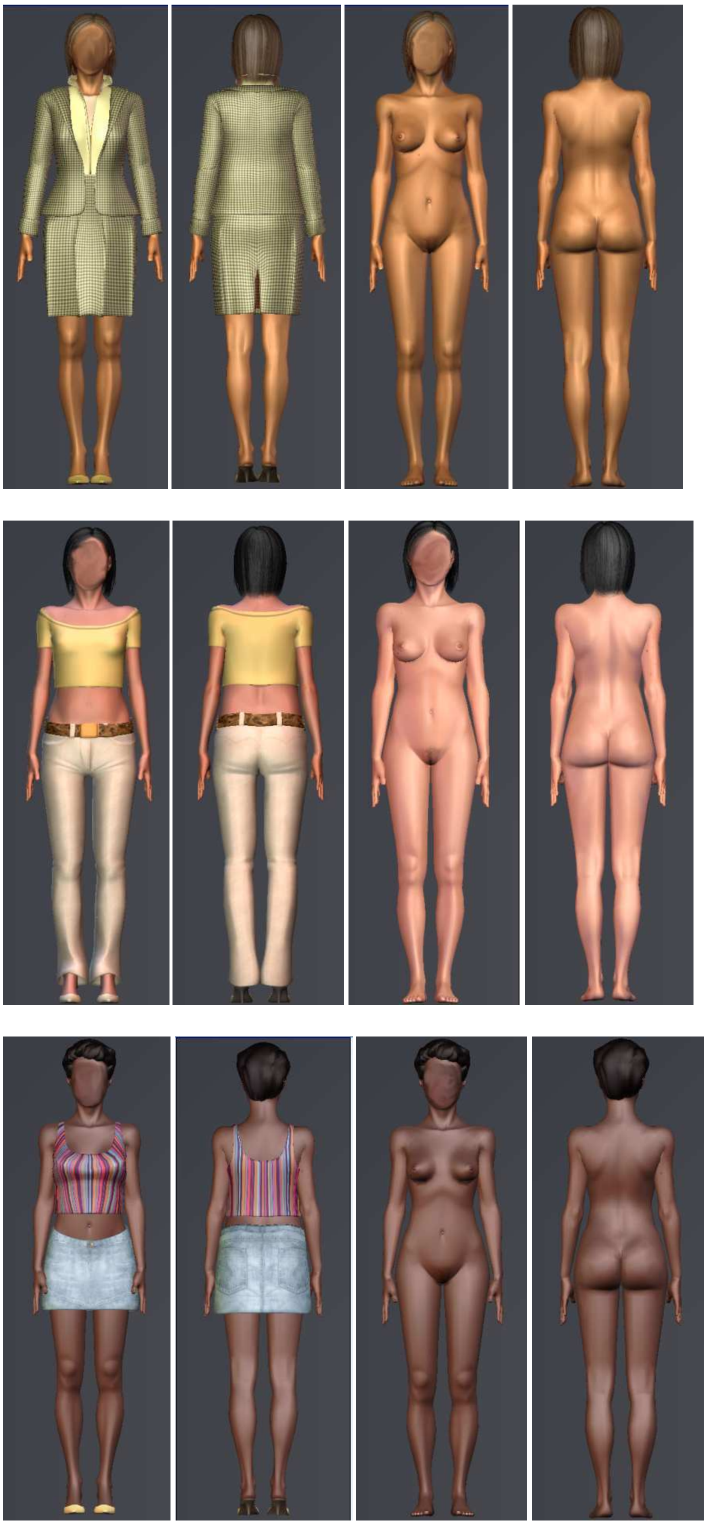
- 1 = 0 same-sex sexual partner
- 2 = 1 same-sex sexual partner
- 3 = 2 same-sex sexual partners
- 4 = 3-5 same-sex sexual partners

Q. 4:

- 1 = heterosexual (straight)

Appendix II: Twelve different models of realistic female bodies





Appendix III : Sexual Orientation Questionnaire (SOQ)

1. Think about **your sexual feelings** (the extent to which you are attracted to, and fantasize about, persons of the opposite or same sex). Would you say they are:

- ☐ Exclusively heterosexual
- ☐ Predominantly heterosexual, only occasionally homosexual
- ☐ Predominantly heterosexual, but more than occasionally homosexual
- ☐ Equally heterosexual and homosexual (i.e. bisexual)
- ☐ Predominantly homosexual, but more than occasionally heterosexual
- ☐ Predominantly homosexual, but occasionally heterosexual
- ☐ Exclusively homosexual

2. Please indicate the **number of OPPOSITE-SEX sexual partners** you have had during your entire lifetime ("sexual contact" is taken to mean any activity which made you sexually excited and in which your genitals made contact with any part of the other person):

- ☐ 0 (none)
- ☐ 1
- ☐ 2
- ☐ 3-5
- ☐ 6-10
- ☐ 11-20
- ☐ 21-50
- ☐ Over 50

3. Please indicate the **number of SAME-SEX sexual partners** you have had during your entire lifetime ("sexual contact" is taken to mean any activity which made you sexually excited and in which your genitals made contact with any part of the other person):

- ☐ 0 (none)
- ☐ 1
- ☐ 2
- ☐ 3-5
- ☐ 6-10
- ☐ 11-20
- ☐ 21-50
- ☐ Over 50

4. Think about how you **identify yourself**. Would you say that you are:

- ☐ Hereosexual (straight)
- ☐ Bisexual
- ☐ Homosexual (gay/lesbian)

Appendix IV: Instruction of the rating task

« Bienvenu dans cette expérience. Votre tâche sera d'évaluer le niveau d'attractivité des images qui vont suivre : « combien » le physique de la personne sur la photo est attrayant pour vous ? En utilisant la souris, cliquez sur le bouton et en déplaçant la barre, sélectionnez l'un des niveaux suivants de jugement : 1 = pas du tout attractif ; 2 = moyennement attractif ; 3 = attractif ; 4 = très attractif ; 5 = extrêmement attractif. ».

Appendix V: Raw data of the rating task for the 16 categories of realistic female bodies for each participant

		d	d	d	d	d	d	d	d	n	n	n	n	n	n	n	n
		b	b	b	b	f	f	f	f	b	b	b	b	f	f	f	f
No	**Gender**	**s**	**m**	**l**	**xl**	**s**	**m**	**l**	**xl**	**s**	**m**	**l**	**xl**	**s**	**m**	**l**	**xl**
1	**M**	41.08	46.25	38.25	34.42	43.58	53.83	39.42	35.1	44	47.83	43.25	31.5	44.08	48.75	33.83	26.08
2	**M**	37	33.75	29.42	12.08	31.17	37.83	24.33	17.3	36.75	44.25	19.42	11.42	37.67	37.83	23.33	14.25
3	**M**	52.5	69	41.25	33.08	49.25	62.25	42.42	25.4	64.5	77.92	30.08	28.75	68	68.17	35.67	11.25
4	**M**	41.33	47.42	35.08	38.83	57.83	51.83	41.5	33.1	43.25	49.67	28.67	20.25	57.5	51.75	35	20.67
5	**M**	59.92	57.83	45.42	49.42	66	71.83	55.67	60	96.75	93	91.25	79.58	86.83	92.83	92.67	76.67
6	**M**	11.92	18.42	0.67	1.25	8.75	20.75	0.92	5	28.83	32	5.67	0.83	19.83	18.92	3.5	0.58
7	**M**	46.42	59	28.33	27.5	41.25	56	27.25	25.3	68.5	78.42	41.75	30.58	46.08	50.83	22.83	13.17
8	**M**	61.92	67.92	44.67	29.33	57.42	67.67	41.83	25	69.58	75.83	43.83	22.33	68.25	73.17	50.83	24.75
9	**M**	51.58	57.83	37	26.92	56.08	55.75	35.08	26.8	74.33	84.75	41.5	24.83	61.83	65.83	28.83	10.42
10	**M**	60.75	72.92	36.67	39.08	59.42	65.42	36.25	24.3	55.42	84.75	32.33	21.42	71.08	79.92	47.58	15.67
11	**M**	45.58	61.58	29.08	14.5	45.5	60.08	28.92	10.5	62.08	88.67	24.58	20.25	76.42	82.92	32.83	12.25
12	**M**	25.25	25.5	12.92	7.17	21.83	27.42	8.83	5.17	31.17	47.5	5.25	0.83	39.42	47.42	13.08	1.42
13	**M**	58.92	66.08	35	38.67	51.25	62.25	29.83	21.3	59	85.5	19.42	10.25	82	86	48.17	12.25
14	**M**	60.5	81.92	33.33	33.58	70.17	68.17	37.42	42	52.92	80.25	28.92	19.42	58.17	79.17	26.75	14
15	**M**	65.67	74.42	49.08	44	59.83	61.08	43.25	25.1	69.67	77.33	42.17	29.75	69.92	76.92	44.33	27.08
16	**M**	43.25	41.42	31	34.25	40.83	42.25	35.58	28.8	37.92	50.58	38.08	33.08	53.42	50.83	48.5	36.92
17	**M**	58.92	75	35.75	24.75	62.58	59.75	33.75	13.5	81.17	94.58	50.58	18.83	63.67	81.08	30.17	7.75
18	**M**	26.25	34.5	26.67	20.83	36.75	44	29.33	15.9	29	51.83	23.5	15.08	40.67	61.25	32.17	13.67
19	**M**	62.75	72.67	52.58	41	60.08	62.33	49.67	23	69.92	67.83	37.5	26	48.42	59.42	26	5.42
20	**M**	17.08	14.83	17.33	11.08	21.17	18.75	10.75	10.8	41.67	41.33	22.75	6.92	12.67	20.92	5.08	13.25
21	**F**	31.42	25.75	26	28.67	31.67	27.33	25.42	27	29.25	35.58	23.75	23.17	27	24.92	27.17	20.33
22	**F**	49.58	82.75	23.17	14.08	39.33	57.5	13.92	4.08	56.92	86.08	13.83	0.25	77.92	81.58	17.58	0.75
23	**F**	19.75	40.83	10.17	22	24.75	34.67	19.08	13.4	47.75	55.33	24.5	14.08	49.25	55.42	19.5	12
24	**F**	36.5	48.33	19.67	18	37.75	41.08	14.17	11.3	57.17	54.33	36.42	16.33	22.58	34.33	10	3.42
25	**F**	31.42	33.58	18.67	8.92	37.58	47.58	12.92	7.42	35.92	43.17	19	17.25	37.17	48.25	17.08	6.92
26	**F**	51.75	47.17	41.42	23.17	51.08	62.08	41.58	18	63.75	69.58	47	12.83	43.33	53.83	27.33	16.17
27	**F**	66.58	56.42	53.25	40.67	62.75	51.83	42.67	34.1	56.67	71.5	33.92	26	78.17	79.25	62.17	35.92
28	**F**	50.83	59.25	45.17	37.83	50.92	53.83	34.33	25.5	59.5	53.92	40.33	29.25	67.42	65.75	47.75	29.42
29	**F**	41.92	44.5	36.08	15.42	38.42	38.33	25.92	6.67	72.5	54.75	39.92	22.83	70.83	61	29.25	8.75
30	**F**	50.5	52.25	47	38.67	46.42	48.83	43.42	34.1	54.17	54.08	50.83	33.42	34.25	38.75	24.67	5.83
31	**F**	51.33	49.92	25.75	26.33	50.17	52.83	32.08	18.1	64	71.92	30.83	18.17	52.75	57.08	33.67	10.92
32	**F**	53.33	59.5	37.83	29.5	49.92	53.5	42.17	20.3	51.58	58.25	30.58	16.5	56.42	59.25	35.17	9.5
33	**F**	55.75	59.92	39.42	35.33	55.33	74.08	38.92	27.1	45.42	55.58	23	12.5	84.58	84.83	48.25	16.75
34	**F**	49.5	52.25	33.75	25.58	47.67	52	33.75	19.2	62.08	73.92	68.58	40.17	66.08	68.25	40.08	17
35	**F**	58.67	66.25	59.92	33.67	54.83	56.92	49.67	33	43.67	59.42	27.25	18.75	50.08	54.75	23.5	10
36	**F**	58.83	59	44.92	37	56.67	60.92	46	38.9	63.58	63.58	46.17	15.83	57.25	58.58	45.33	18.08
37	**F**	44.5	51.75	45.25	33.83	52.42	66	39.33	22.5	76.42	94.25	48.5	29.75	71.5	87	53.75	21.42
38	**F**	23.08	29.92	20.42	9.08	18.67	24.25	12.08	4.17	28	24.17	20.75	4.58	14.83	25.33	11.58	9.08
39	**F**	17.92	16	16.5	17	11.58	18.83	17.17	18.2	39.67	42.92	28.25	16.92	36.75	31.17	24.25	12.67
40	**F**	61.92	72.25	37.33	28.83	60.33	72.08	33.58	14.9	49.92	69.67	35.17	24.83	59.83	68.58	39.42	12.92
	Mean	**45.842**	**52.146**	**33.53**	**27.133**	**45.48**	**51.09**	**31.75**	**21.8**	**54.36**	**63.65**	**33.98**	**21.13**	**54.1**	**59.296**	**32.97**	**15.88**

Appendix VI: Behavioral results: Post hoc Test of Tukey HSD WHR

		1	2	3	4
Cell No.	WHR	{49.944}	{56.545}	{33.057}	{21.481}
1	0.6		0.000796	0.000137	0.000137
2	0.7	0.000796		0.000137	0.000137
3	0.8	0.000137	0.000137		0.000137
4	0.9	0.000137	0.000137	0.000137	

Error: Within MSE = 219.85, df = 114. Red numbers are those which are significant (*p*<.05).

Appendix VII: Behavioral results: Post hoc Test of Tukey HSD Perspective x WHR

			1	2	3	4	5	6	7	8
Cell No.	Perspective	WHR	{50.1}	{57.896}	{33.753}	{24.133}	{49.787}	{55.194}	{32.36}	{18.83}
1	Back	0.6		0.000118	0.000118	0.000118	0.999940	0.000118	0.000118	0.000118
2	Back	0.7	0.000118		0.000118	0.000118	0.000118	0.023999	0.000118	0.000118
3	Back	0.8	0.000118	0.000118		0.000118	0.000118	0.000118	0.671309	0.000118
4	Back	0.9	0.000118	0.000118	0.000118		0.000118	0.000118	0.000118	0.000118
5	Front	0.6	0.999940	0.000118	0.000118	0.000118		0.000118	0.000118	0.000118
6	Front	0.7	0.000118	0.023999	0.000118	0.000118	0.000118		0.000118	0.000118
7	Front	0.8	0.000118	0.000118	0.671309	0.000118	0.000118	0.000118		0.000118
8	Front	0.9	0.000118	0.000118	0.000118	0.000118	0.000118	0.000118	0.000118	

Error: Within MSE =26.095, df = 114. Red numbers are those which are significant (*p*<.05).

Appendix VIII: Behavioral results: Post hoc Test of Tukey HSD Clothes x WHR

			1	2	3	4	5	6	7	8
Cell No.	Clothes	WHR	{45.658}	{51.62}	{32.642}	{24.454}	{54.229}	{61.471}	{33.472}	{18.508}
1	Dressed	0.6		0.000118	0.000118	0.000118	0.000118	0.000118	0.000118	0.000118
2	Dressed	0.7	0.000118		0.000118	0.000118	0.151600	0.000118	0.000118	0.000118
3	Dressed	0.8	0.000118	0.000118		0.000118	0.000118	0.000118	0.990386	0.000118
4	Dressed	0.9	0.000118	0.000118	0.000118		0.000118	0.000118	0.000118	0.000118
5	Naked	0.6	0.000118	0.151600	0.000118	0.000118		0.000118	0.000118	0.000118
6	Naked	0.7	0.000118	0.000118	0.000118	0.000118	0.000118		0.000118	0.000118
7	Naked	0.8	0.000118	0.000118	0.990386	0.000118	0.000118	0.000118		0.000118
8	Naked	0.9	0.000118	0.000118	0.000118	0.000118	0.000118	0.000118	0.000118	

Error: Within MSE =38.970, df = 114. Red numbers are those which are significant (*p*<.05).

Appendix IX: Written information concerning the purpose of the electrophysiological experiment and written consent

Projet: Neuropsychologie des affects. Version du 05/01/2010

HUG Hôpitaux Universitaires de Genève

Hôpital Cantonal
Clinique de Neurologie
-Unité de Neuropsychologie

Information au sujet volontaire

Madame, Mademoiselle, Monsieur

Le but de cette étude intitulée « Neuropsychologie des affects », est de tenter de déterminer, par des moyens non-invasifs, les régions cérébrales responsables de différents aspects des émotions. Nous prévoyons ainsi de vous présenter des images présentant un contenu affectif pendant un enregistrement électroencéphalographique (appelé « EEG »). Ceci nous permettra de mesurer les réponses électriques de votre cerveau grâce à des capteurs placés sur la surface du scalp. Vous devrez également remplir un questionnaire concernant certains aspects de votre personnalité.

Lors de cette épreuve nous vous présenterons des images plus ou moins chargées émotionnellement, représentant des visages exprimant des émotions, ainsi que des corps nus ou habillés. Cela devrait prendre environ 2 heures à chaque séance.

Votre participation est cependant volontaire. Vous avez le droit de vous en retirer à tout moment. Cette étude ne sera d'aucun bénéfice pour vous et ne comporte aucun risque.

En cas de dommage subis dans le cadre de l'étude, vous bénéficierez d'une compensation pleine et entière ; une assurance spéciale a été contractée pour couvrir cette responsabilité. Le cas échéant, l'investigateur vous prêtera assistance pour entreprendre les démarches nécessaires.

Afin de maintenir la stricte confidentialité, vos données ne seront pas sauvées sous votre vrai nom, mais sous un nom codé. Les résultats analysés de cette étude pourront faire l'objet de publications scientifiques. Le protocole a été approuvé par le chef du Service de Neurologie des Hôpitaux Universitaires de Genève et le Comité d'Ethique NAC.

Veuillez noter que l'investigateur a la possibilité de vous exclure de l'étude à tout moment en vous précisant le motif (par exemple, si vous ne répondez plus aux exigences/critères prévus par le protocole).

Avez-vous des questions? Si tel n'est pas le cas actuellement, vous pouvez demander des informations en tout temps auprès de Dr A.J. Pegna, Unité de Neuropsychologie, Hôpitaux Universitaires de Genève.

Rue Gabrielle-Perret-Gentil 4 **CH-1211 Genève 14** e-mail :alan.pegna@hcuge.ch Tel : +41 (0)22 372 83 53 Fax : +41 (0)22 372 82 99

HUG Hôpitaux Universitaires de Genève

Hôpital Cantonal

Clinique de Neurologie
Unité de Neuropsychologie

Consentement éclairé – patient/sujet volontaire

En signant cette formule, j'accepte de participer volontairement à l'étude appelée « Neuropsychologie des affects ». Les chercheurs m'ont expliqués oralement et par écrit les buts de cette expérience ainsi que son déroulement et j'ai été informé que je ne tirerai aucun bénéfice, avantage, ou inconvénient à participer à cette étude. Je sais également que je n'encours aucun risque particulier en effectuant cette étude.

J'ai lu et compris le dossier d'information au patient/sujet volontaire pour l'étude susnommée. J'ai reçu des réponses satisfaisantes aux questions concernant ma participation à cette étude. Je peux garder le dossier d'information au patient/ sujet volontaire et je reçois une copie de ma déclaration écrite de consentement.

J'ai eu suffisamment de temps pour réfléchir avant de prendre ma décision de participer à cette étude. J'accepte que les spécialistes responsables travaillant pour le promoteur de l'étude, les représentants des autorités et des commissions d'éthique aient un droit de regard sur les données originales me concernant pour procéder à des vérifications, ces informations restant toutefois strictement confidentielles.

Je consens à participer à l'étude de mon plein gré et peux m'en retirer de tout temps, avec ou sans motif, dans le cas d'un patient traité ; sans que cela ait des conséquences sur la qualité des soins qui me seront prodigués ou sur les rapports que j'aurais avec les médecins ou autres thérapeutes.

Je sais qu'une assurance couvre les dommages qui pourraient survenir dans le cadre de l'étude.

Sujet :	**Investigateur responsable :**
Nom et Prénom :	Nom et prénom :…………………
Date et Lieu : … ……	Date et Lieu : …………………..
Signature : …	Signature : ………………………

Rue Gabrielle-Perret-Gentil 4 — **CH-1211 Genève 14** — e-mail :alan.pegna@hcuge.ch — Tel : +41 (0)22 372 83 53 — Fax : +41 (0)22 372 82 99

Appendix X: Confidential questionnaire before the electrophysiological experiment

Projet: Neuropsychologie des affects. Version du 8/12/2009

Hôpital Cantonal

Laboratoire Expérimental de Neuropsychologie (LenPsy)
Département Neuropsychologie
Service de Neurologie

HUG Hôpitaux Universitaires de Genève

Etude EEG

Données personnelles: Questionnaire confidentiel pour la participation à l'étude

" ***Neuropsychologie des affects*** "

Questionnaire confidentiel (1/2)

Nom : …………………………………………………………………………………………….
Prénom : ……………………………………………………………………………………………

Sexe (M/F) : ….. ……………………………………………………………………………………

Date de naissance (J/M/A) : …… / …… / ………………………………………………………………

Date de l'expérimentation : ……………………………………………………………………...

Profession (si étudiant, précisez faculté et année) : ………………………………………………...

Seriez-vous disposé à participer à une nouvelle expérience (oui/non) ? :……………………………..

Nous vous remercions d'avoir accepté librement et de votre plein gré de participer à cette recherche. Nous voudrions vous rappeler i) que vos données personnelles (ce questionnaire et autres données y compris les enregistrements seront traitées en toute confidentialité ; que l'accès à ces données est placé sous la responsabilité du responsable et l'expérimentateur de la recherche et que celles-ci ne peuvent être divulguées à l'extérieur.

Les questions qui suivent nous aident à mieux établir l'influence de votre état actuel de santé sur le déroulement de l'expérience et les résultats :

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Appendix XI: Confidential questionnaire before the electrophysiological experiment

Projet: Neuropsychologie des affects. Version du 8/12/2009

Questionnaire confidentiel (2/2)

1. Combien d'heures avez-vous dormi la nuit passée (à ½ heure près) ? ……..
   La durée de votre sommeil a-t-elle été :

un peu trop courte	normale	plutôt longue

2. Heure du dernier repas : …………

3. Combien de tasse de café ou de thé avez-vous bu depuis ce matin ? ……………………………………………
   Par rapport a vos habitues, cette consommation a été :

moins que d'habitude	normale	plus que d'habitude

4. Combien de cigarettes avez-vous fumé aujourd'hui ? ………………………………………………………….
   Par rapport a vos habitues, cette consommation a été :

moins que d'habitude	normale	plus que d'habitude

5. Souffrez-vous actuellement d'un problème de santé ? ……
   Si oui, lequel ? ………………………………………………………………………………………………………

6. Avez-vous déjà eu un problème neurologique ? ……
   Si oui, lequel ? ……………………………………………………………………………………………………..

7. Votre acuité visuelle est-elle bonne ? Si corrigée, précisez ………………………….....................................

8. Avez-vous pris hier ou aujourd'hui des médicaments ou des drogues ?
   Si oui, lesquels ……………………………………………………………………………….................................

9. Avez-vous consommé de l'alcool dans les dernières 24 heures ? ………………………………………………...
   Si oui, précisez l'heure : ……………………………………………………………………………………...

Pour les femmes,

10a. Dans quel période de votre cycle menstruel vous trouvez vous actuellement ? ………………………………….

10b. Qu'elles en sont les influences (s'il y en a) sur votre état ? ……………………………………………………

10c. Prenez-vous un contraceptif oral ? …………………………………………………………………………..

11. Indiquez ci-dessous les éventuels autres facteurs qui auraient pu influencer votre performance.
    ………..
    ………..
    ………..
    ………..

Date et Signature sur Sujet (mention lue et approuvée)……………………………………………

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Appendix XII: Edinburgh Handedness Inventory

Hôpitaux Universitaires de Genève
Département de Neurosciences Cliniques et Dermatologie

CLINIQUE ET POLICLINIQUE DE NEUROLOGIE
Lab. de Neuropsychologie Expérimentale et Unité de Neuropsychologie

24, rue Micheli-du-Crest, CH-1211 Genève 14

Nom.................................. Prénom..........................
Date de naissance................. Sexe..............................

TEST DE LATERALITE
(Edinburgh Handedness Inventory)

Prière d'indiquer votre préférence manuelle pour chacune des activités ci-dessous en inscrivant un signe "+" dans la colonne appropriée.

Si la préférence est si forte que vous n'utilisez l'autre main que si vous y êtes absolument forcé, inscrivez "++".

Si vous utilisez l'une ou l'autre main indifféremment, incrivez un "+" dans chaque colonne.

Essayez S.V.P. de répondre à toutes les questions

No'	***Activités***	***Main gauche***	***Main droite***
1	Ecrire		
2	Dessiner		
3	Coudre (main tenant l'aiguille)		
4	Tenir une paire de ciseaux		
5	Se brosser les dents		
6	Tenir un couteau		
7	Tenir une cuillère		
8	Tenir un balai (main supérieure)		
9	Allumer une allumette (main tenant l'allumette)		
10	Ouvrir une boîte (main tenant le couvercle)		

Total gauche =	Total droite =
QL =	***Décile =***

Appendix XIII: Mean luminance and ANOVA analysis of the luminance of the realistic female bodies

		b	b	b	b	b	b	b	b	f	f	f	f	f	f	f	f
		d	d	d	d	n	n	n	n	d	d	d	d	n	n	n	n
	Models	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9	0.6	0.7	0.8	0.9
1	fb_dresAI.bmp	88.047	87.774	88.54	88.813	84.18	84.4	84.59	84.86	82.91	83.01	82.985	83.168	77.8	77.77	77.66	78.06
2	fb_dresBI.bmp	70.323	69.637	71.541	70.186	102	97.6	98.93	102.1	71.59	71.15	71.676	71.333	97.93	98.3	98.36	98.48
3	fb_dresCI.bmp	73.286	68.344	73.261	71.394	72.93	74.6	74.22	74.46	68.3	68.45	68.215	68.611	70.39	70.19	70.39	70.48
4	fb_dresDI.bmp	87.459	85.911	89.085	83.004	102.3	109	104.7	114.4	85.19	85.27	85.427	86.158	105	106	110.4	111
5	fb_dresEI.bmp	68.232	67.435	66.382	66.641	96.84	97.2	97.36	97.41	67	67.25	67.648	67.815	95.41	96.8	97.1	96.24
6	fb_dresFI.bmp	78.021	72.354	74.391	74.005	73.25	74.5	77.26	76.39	78.09	78.07	78.087	78.217	75.09	75.23	75.33	75.21
7	fb_dresGI.bmp	89.682	90.487	91.904	93.311	87.55	87.9	86.12	89.24	91.19	91.68	92.04	92.306	87.03	87.24	87.78	87.92
8	fb_dresHI.bmp	101.211	99.752	102.07	98.844	101.2	104	102.5	99.54	101	101	101.43	101.93	105.3	105.3	105.7	104.9
9	fb_dresII.bmp	86.767	86.386	87.039	86.98	78.9	76.8	78.12	79.44	84.07	84.35	84.825	85.204	76.3	76.55	76.85	76.69
10	fb_dresLI.bmp	103.037	106.315	103.11	101.95	111.4	104	111.1	106.9	104.5	104.7	104.5	105.68	108.6	109.3	109.3	110.5
11	fb_dresMI.bmp	101.504	102.64	102.09	102.76	95.05	101	95.23	94.98	98.85	99.07	99.328	99.953	99.03	99.09	99.83	100.2
12	fb_dresNI.bmp	102.163	100.711	101.62	99.759	96.16	98.5	99.74	100.7	103.3	103.3	103.31	103.65	102.1	102.6	103	103.5
	Mean	87.4777	86.4788	87.586	86.47	91.82	92.4	92.48	93.37	86.33	86.44	86.623	87.003	91.67	92.02	92.64	92.76

Effect	SS	Degree of Freedom	MS	F	p
Intercept	1541402	1	1541402	730.9457	0.000000
Error	23197	11	2109		
Perspective	5	1	5	0.2008	0.662762
Error	277	11	25		
Clothes	1504	1	1504	2.1549	0.170119
Error	7679	11	698		
WHR	14	3	5	2.8516	0.05221
Error	54	33	2		
Perspective x Clothes	0	1	0	0.0462	0.833707
Error	73	11	7		
Perspective x WHR	2	3	1	0.5914	0.625032
Error	45	33	1		
Clothes x WHR	14	3	5	1.4425	0.248112
Error	106	33	3		
Perspective x Clothes x WHR	11	3	4	1.429	0.251878
Error	83	33	3		

Appendix XIV: **Instruction of the electrophysiological experiment**

Cette expérience a été crée afin d'étudier la perception des corps. Il y aura huit sessions. Dans chaque session, des images de femmes, d'hommes ou de figures réalistes seront présentées aléatoirement sur l'écran de l'ordinateur (voir images ci-dessous). Ces images différent selon l'habillement et peuvent être positionnées de dos ou de face.

Les images sont réalistes et non réelles puisqu'elles ont étés conçues à travers un programme virtuel.
En fonction de chaque session, il vous sera demandé de répondre en appuyant sur la touche 2 du clavier uniquement lorsque vous verrez des images d'hommes, ou de répondre uniquement lorsque vous verrez des images d'animaux fantastiques. De plus, à nouveau selon la session, vous devrez répondre avec votre index de la main droite ou de la main gauche. L'expérimentateur vous indiquera pour chaque nouvelle session les images auxquelles il faudra répondre (soit les images d'hommes, soit les images d'animaux fantastiques) et avec quelle main répondre (gauche ou droite).

Il est très important que:

- vos yeux restent fixés sur la croix de fixation au centre de l'écran. Dans la mesure du possible, essayer de ne pas bouger les yeux.
- Votre réponse doit être la plus correcte et rapide possible.

De plus, il est important d'éviter des mouvements oculaires verticales et horizontales, de cligner des yeux, de fermer les paupières, de déglutir, etc.

Avant de commencer l'expérience, vous aurez la possibilité de faire un essai pratique.

Si vous avez encore des questions après avoir lu les instructions sur l'écran, n'hésitez pas à questionner l'expérimentateur.
Merci pour votre participation à l'expérience.

Appendix XV: Mean amplitude of the N190 component for each of the 96 conditions

Clothes Perspective WHR Electrode	N	Mean (µV)	Minimum	Maximum	SD
D F 0.6 A14	20	-2.44785	-9.8103	2.218749	3.164323
D F 0.6 A15	20	-2.16605	-8.2299	3.806260	3.358700
D F 0.6 A16	20	-1.61896	-7.0846	3.680679	3.197779
D F 0.6 A27	20	-2.42968	-9.1142	2.864683	3.230881
D F 0.6 A28	20	-1.79368	-8.6028	2.734899	3.397322
D F 0.6 A29	20	-1.37137	-6.5688	2.817072	3.073715
D F 0.7 A14	20	-2.37586	-10.0086	3.221821	3.492142
D F 0.7 A15	20	-2.03106	-9.6589	4.017012	3.601260
D F 0.7 A16	20	-1.72791	-10.3024	4.287354	3.271993
D F 0.7 A27	20	-2.11085	-9.3557	4.554429	3.560804
D F 0.7 A28	20	-1.57710	-9.0663	4.527715	3.749981
D F 0.7 A29	20	-1.18361	-5.8563	4.637711	3.318024
D F 0.8 A14	20	-2.43904	-8.1614	2.603353	2.967507
D F 0.8 A15	20	-2.04170	-7.8604	2.328588	2.990676
D F 0.8 A16	20	-1.86076	-8.3028	2.132261	2.825146
D F 0.8 A27	20	-2.45090	-8.1137	3.371337	3.375378
D F 0.8 A28	20	-2.09270	-7.7127	2.815830	3.383885
D F 0.8 A29	20	-1.78419	-6.3248	2.573564	2.964697
D F 0.9 A14	20	-2.17524	-8.5879	4.164444	3.589308
D F 0.9 A15	20	-1.66601	-7.2939	4.372861	3.495675
D F 0.9 A16	20	-1.14449	-7.6430	4.582463	3.463742
D F 0.9 A27	20	-2.29872	-7.4841	2.924926	3.252069
D F 0.9 A28	20	-1.64617	-7.1400	2.911657	3.411627
D F 0.9 A29	20	-1.17402	-5.8719	2.918822	3.043239
D B 0.6 A14	20	-2.42638	-8.5156	2.808120	3.280081
D B 0.6 A15	20	-1.95052	-8.1532	4.569513	3.532060
D B 0.6 A16	20	-1.64084	-8.5684	3.859818	3.260493
D B 0.6 A27	20	-2.24948	-7.2998	3.501876	3.391302
D B 0.6 A28	20	-1.60427	-6.9331	3.479837	3.438886
D B 0.6 A29	20	-1.27427	-6.2411	3.710541	3.046339
D B 0.7 A14	20	-1.87845	-8.1792	2.771227	3.112581
D B 0.7 A15	20	-1.57550	-7.0166	3.848320	3.239799
D B 0.7 A16	20	-1.48116	-7.6174	2.806271	2.896651
D B 0.7 A27	20	-2.04329	-7.5611	3.309590	3.092837
D B 0.7 A28	20	-1.46169	-7.1195	3.134522	3.287012
D B 0.7 A29	20	-1.17122	-5.9991	3.349694	3.016998
D B 0.8 A14	20	-1.87467	-8.8496	3.368858	3.383900
D B 0.8 A15	20	-1.54064	-7.1950	4.295682	3.238352
D B 0.8 A16	20	-1.32591	-6.1047	3.237979	2.802570
D B 0.8 A27	20	-1.96785	-8.8877	3.700833	3.376296
D B 0.8 A28	20	-1.30180	-8.5809	3.682559	3.506303
D B 0.8 A29	20	-0.99864	-5.6737	2.994873	3.023170
D B 0.9 A14	20	-1.82900	-8.2170	3.773413	3.453442
D B 0.9 A15	20	-1.36251	-6.7379	4.908854	3.528977
D B 0.9 A16	20	-1.22018	-6.7404	4.977477	3.041556

D B 0.9 A27	20	-1.77215	-8.2159	3.987864	3.487181
D B 0.9 A28	20	-1.35718	-7.7634	3.888332	3.507663
D B 0.9 A29	20	-1.14545	-6.2651	4.180687	2.997363
N F 0.6 A14	20	-3.66086	-11.2774	2.778531	3.722525
N F 0.6 A15	20	-3.22721	-10.4379	3.939639	4.075635
N F 0.6 A16	20	-2.33395	-9.3601	3.778116	3.705427
N F 0.6 A27	20	-3.74112	-11.8041	2.067977	3.726796
N F 0.6 A28	20	-2.93351	-11.3287	2.200753	3.940549
N F 0.6 A29	20	-2.10014	-6.8370	2.387685	3.347762
N F 0.7 A14	20	-3.31510	-10.9292	1.641958	3.379082
N F 0.7 A15	20	-2.79605	-9.8837	3.260925	3.878260
N F 0.7 A16	20	-2.29773	-9.4762	2.925188	3.533569
N F 0.7 A27	20	-3.16179	-10.5809	4.441245	3.648253
N F 0.7 A28	20	-2.48759	-10.1067	4.636199	3.792384
N F 0.7 A29	20	-1.70726	-6.2093	4.823350	3.301836
N F 0.8 A14	20	-3.21385	-11.3331	2.835680	3.860846
N F 0.8 A15	20	-2.70323	-9.5033	4.043449	4.218150
N F 0.8 A16	20	-2.05861	-7.4842	3.808975	3.786366
N F 0.8 A27	20	-3.19223	-11.5716	4.976886	3.843925
N F 0.8 A28	20	-2.45696	-11.1359	5.042994	3.993307
N F 0.8 A29	20	-1.76142	-6.7077	5.263032	3.455952
N F 0.9 A14	20	-3.41979	-11.7698	4.060743	3.938505
N F 0.9 A15	20	-2.69823	-9.4448	5.848383	4.277012
N F 0.9 A16	20	-2.12717	-9.3150	5.288643	3.848056
N F 0.9 A27	20	-3.35875	-10.9509	2.402130	3.526613
N F 0.9 A28	20	-2.56360	-10.6467	2.396161	3.699937
N F 0.9 A29	20	-1.88026	-7.0113	2.699174	3.134713
N B 0.6 A14	20	-3.35205	-11.9112	2.732060	3.711791
N B 0.6 A15	20	-3.15055	-10.3240	4.208913	4.024396
N B 0.6 A16	20	-2.61795	-11.2218	3.791053	3.868824
N B 0.6 A27	20	-3.05408	-11.2898	5.913664	3.840621
N B 0.6 A28	20	-2.51276	-11.0184	5.827401	4.056494
N B 0.6 A29	20	-2.00185	-7.2820	6.093826	3.568854
N B 0.7 A14	20	-2.97152	-10.8412	1.749251	3.475153
N B 0.7 A15	20	-2.75041	-9.3777	4.149313	3.851278
N B 0.7 A16	20	-2.22262	-10.2327	3.642077	3.658390
N B 0.7 A27	20	-3.03749	-10.8929	3.590060	3.525979
N B 0.7 A28	20	-2.50974	-10.4209	3.652484	3.694716
N B 0.7 A29	20	-2.11441	-7.7969	3.878556	3.178907
N B 0.8 A14	20	-2.58773	-10.8858	5.023302	3.730445
N B 0.8 A15	20	-2.44579	-8.9880	4.901841	3.804695
N B 0.8 A16	20	-2.38387	-10.2025	3.830876	3.395879
N B 0.8 A27	20	-2.36477	-9.8481	6.357063	3.781329
N B 0.8 A28	20	-1.98135	-9.6206	6.323634	3.759215
N B 0.8 A29	20	-1.64478	-6.1044	6.627609	3.224616
N B 0.9 A14	20	-2.59867	-11.1845	3.303876	3.684164
N B 0.9 A15	20	-2.07792	-9.4812	4.470519	4.010093

N B 0.9 A16	20	-1.89715	-11.3053	3.039009	3.835728
N B 0.9 A27	20	-2.32286	-10.8634	4.826426	3.763656
N B 0.9 A28	20	-1.96478	-10.4238	4.779499	3.732208
N B 0.9 A29	20	-1.56198	-6.0913	4.909236	3.164897

Appendix XVI: Mean amplitude of the N190 component with WHR, perspective, clothes and their interaction

WHR	Perspective	Clothes	Mean	SE	-95.00%	95.00%	N
0.6			-2.40247	3.216370	-9.15982	4.354868	20
0.7			-2.16622	3.163283	-8.81204	4.479587	20
0.8			-2.10306	3.011744	-8.43050	4.224382	20
0.9			-1.96926	3.218501	-8.73108	4.792558	20
	Front		-2.30842	4.499852	-11.7623	7.145414	20
	Back		-2.01209	4.413450	-11.2844	7.260228	20
		Dressed	-1.75127	4.157094	-10.4850	6.982461	20
		Naked	-2.56924	4.794748	-12.6426	7.504154	20
0.6	**Front**		-2.48537	2.284758	-7.28546	2.314733	20
0.7	**Front**		-2.23099	2.278432	-7.01780	2.555817	20
0.8	**Front**		-2.33797	2.173992	-6.90535	2.229423	20
0.9	**Front**		-2.17937	2.340980	-7.09759	2.738846	20
0.6	**Back**		-2.31958	2.294827	-7.14084	2.501671	20
0.7	**Back**		-2.10146	2.232450	-6.79166	2.588745	20
0.8	**Back**		-1.86815	2.101046	-6.28228	2.545984	20
0.9	**Back**		-1.75915	2.248328	-6.48271	2.964410	20
0.6		**Dressed**	-1.91445	2.043538	-6.20776	2.378869	20
0.7		**Dressed**	-1.71814	2.209375	-6.35987	2.923585	20
0.8		**Dressed**	-1.80657	1.964638	-5.93412	2.320985	20
0.9		**Dressed**	-1.56593	2.189659	-6.16623	3.034376	20
0.6		**Naked**	-2.89050	2.541568	-8.23014	2.449133	20
0.7		**Naked**	-2.61431	2.307055	-7.46125	2.232635	20
0.8		**Naked**	-2.39955	2.385742	-7.41181	2.612708	20
0.9		**Naked**	-2.37260	2.406553	-7.42858	2.683384	20
0.6	**Front**	**Dressed**	-1.97126	1.467875	-5.05515	1.112626	20
0.7	**Front**	**Dressed**	-1.83440	1.659015	-5.31986	1.651064	20
0.8	**Front**	**Dressed**	-2.11155	1.402244	-5.05755	0.834457	20
0.9	**Front**	**Dressed**	-1.68411	1.615163	-5.07744	1.709223	20
0.6	**Back**	**Dressed**	-1.85763	1.462515	-4.93026	1.215003	20
0.7	**Back**	**Dressed**	-1.60188	1.503653	-4.76094	1.557174	20
0.8	**Back**	**Dressed**	-1.50158	1.421051	-4.48710	1.483933	20
0.9	**Back**	**Dressed**	-1.44774	1.515337	-4.63135	1.735861	20
0.6	**Front**	**Naked**	-2.99947	1.790959	-6.76213	0.763198	20
0.7	**Front**	**Naked**	-2.62759	1.623287	-6.03799	0.782812	20
0.8	**Front**	**Naked**	-2.56438	1.754948	-6.25139	1.122626	20
0.9	**Front**	**Naked**	-2.67463	1.730948	-6.31122	0.961954	20
0.6	**Back**	**Naked**	-2.78154	1.836336	-6.63954	1.076459	20
0.7	**Back**	**Naked**	-2.60103	1.687062	-6.14542	0.943354	20

0.8	**Back**	**Naked**	-2.23472	1.666973	-5.73690	1.267465	20
0.9	**Back**	**Naked**	-2.07056	1.720105	-5.68437	1.543245	20

Appendix XVII: Electrophysiological results - amplitude of N190: Post hoc Test of Tukey HSD for WHR

		1	2	3	4
Cell No.	**WHR**	**{-2.402}**	**{-2.166}**	**{-2.103}**	**{-1.969}**
1	**0.6**		0.027356	0.003172	0.000171
2	**0.7**	0.027356		0.86605	0.086842
3	**0.8**	0.003172	0.86605		0.366051
4	**0.9**	0.000171	0.086842	0.366051	

Error: Within MSE =1.5997, df = 54. Red numbers are those which are significant (*p*<.05).

Appendix XVIII: Electrophysiological results - amplitude of N190: Post hoc Test of Tukey HSD for Electrode

		1	2	3
Cell No.	**Pairs of electrodes**	**{-2.629}**	**{-2.138}**	**{-1.714}**
1	**A14/A27**		0.111173	0.001395
2	**A15/A28**	0.111173		0.187172
3	**A16/A29**	0.001395	0.187172	

Error: Within MSE = 18.011, df =36. Red numbers are those which are significant (*p*<.05).

Appendix XIX: Electrophysiological results - amplitude of N190: Post hoc Test of Tukey HSD for WHR x Gender

			1	2	3	4	5	6	7	8
Cell No.	**Gender**	**WHR**	**{-0.9864}**	**{-0.9474}**	**{-0.6696}**	**{-0.5729}**	**{-3.819}**	**{-3.385}**	**{-3.536}**	**{-3.366}**
1	**Female**	**0.6**		0.999974	0.131973	0.015767	0.395427	0.589723	0.519169	0.598836
2	**Female**	**0.7**	0.999974		0.259493	0.039604	0.379587	0.571459	0.501343	0.580557
3	**Female**	**0.8**	0.131973	0.259493		0.990079	0.277681	0.444906	0.381310	0.453522
4	**Female**	**0.9**	0.015767	0.039604	0.990079		0.247104	0.403731	0.343483	0.411843
5	**Male**	**0.6**	0.395427	0.379587	0.277681	0.247104		0.009524	0.242428	0.005782
6	**Male**	**0.7**	0.589723	0.571459	0.444906	0.403731	0.009524		0.890440	1.000000
7	**Male**	**0.8**	0.519169	0.501343	0.381310	0.343483	0.242428	0.890440		0.814484
8	**Male**	**0.9**	0.598836	0.580557	0.453522	0.411843	0.005782	1.000000	0.814484	

Error: Between; Within; Pooled MSE =8.2877, df = 18.219. Red numbers are those which are significant (*p*<.05).

Appendix XX: Electrophysiological results - amplitude of N190: Post hoc Test of Tukey HSD for WHR x Electrode

			1	2	3	4	5	6	7	8	9	10	11	12
Cell No.	WHR	Pairs of electrodes	{-2.92}	{-2.41}	{-1.87}	{-2.61}	{-2.14}	{-1.73}	{-2.51}	{-2.07}	{-1.72}	{-2.47}	{-1.91}	{-1.51}
1	0.6	A14/A27		0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012	0.00012
2	0.6	A15/A28	0.00012		0.00012	0.00739	0.00014	0.00012	0.74905	0.00012	0.00012	0.99370	0.00012	0.00012
3	0.6	A16/A29	0.00012	0.00012		0.00012	0.00013	0.25222	0.00012	0.00485	0.15592	0.00012	0.99828	0.00012
4	0.7	A14/A27	0.00012	0.00739	0.00012		0.00012	0.00012	0.66443	0.00012	0.00012	0.17700	0.00012	0.00012
5	0.7	A15/A28	0.00012	0.00014	0.00013	0.00012		0.00012	0.00012	0.90973	0.00012	0.00012	0.00056	0.00012
6	0.7	A16/A29	0.00012	0.00012	0.25222	0.00012	0.00012		0.00012	0.00012	1.00000	0.00012	0.02085	0.00129
7	0.8	A14/A27	0.00012	0.749052	0.00012	0.66443	0.00012	0.00012		0.00012	0.00012	0.99968	0.00012	0.00012
8	0.8	A15/A28	0.00012	0.00012	0.00484	0.00012	0.90973	0.00012	0.00012		0.00012	0.00012	0.09104	0.00012
9	0.8	A16/A29	0.00012	0.00012	0.15592	0.00012	0.00012	1.00000	0.00012	0.00012		0.00012	0.01019	0.00280
10	0.9	A14/A27	0.00012	0.993702	0.00012	0.17700	0.00012	0.00012	0.99968	0.00012	0.00012		0.00012	0.00012
11	0.9	A15/A28	0.00012	0.00012	0.99828	0.00012	0.00056	0.02085	0.00012	0.09104	0.01019	0.00012		0.00012
12	0.9	A16/A29	0.00012	0.00012	0.00012	0.00012	0.00012	0.00129	0.00012	0.00012	0.00280	0.00012	0.00012	

Error: Within MSE =.19, df = 108. Red numbers are those which are significant (*p*<.05).

Appendix XXI: Electrophysiological results - amplitude of N190: Post hoc Test of Tukey HSD for Clothes x Electrode

			1	2	3	4	5	6
Cell No.	Clothes	Pairs of electrodes	{-2.173}	{-1.698}	{-1.383}	{-3.085}	{-2.579}	{-2.044}
1	Dressed	A14/A27		0.000132	0.000132	0.000132	0.000140	0.431182
2	Dressed	A15/A28	0.000132		0.000775	0.000132	0.000132	0.000284
3	Dressed	A16/A29	0.000132	0.000775		0.000132	0.000132	0.000132
4	Naked	A14/A27	0.000132	0.000132	0.000132		0.000132	0.000132
5	Naked	A15/A28	0.000140	0.000132	0.000132	0.000132		0.000132
6	Naked	A16/A29	0.431182	0.000284	0.000132	0.000132	0.000132	

Error: Within MSE =.75017, df = 36. Red numbers are those which are significant (*p*<.05).

Appendix XXII: Electrophysiological results - amplitude of N190: Post hoc Test of Tukey HSD for Perspective x Electrode

			1	2	3	4	5	6
Cell No.	Perspective	Pairs of electrodes	{-2.862}	{-2.305}	{-1.758}	{-2.396}	{-1.972}	{-1.669}
1	Front	A14/A27		0.000132	0.000132	0.000132	0.000132	0.000132
2	Front	A15/A28	0.000132		0.000132	0.184065	0.000132	0.000132
3	Front	A16/A29	0.000132	0.000132		0.000132	0.000153	0.195911
4	Back	A14/A27	0.000132	0.184065	0.000132		0.000132	0.000132
5	Back	A15/A28	0.000132	0.000132	0.000153	0.000132		0.000132
6	Back	A16/A29	0.000132	0.000132	0.195911	0.000132	0.000132	

Error: Within MSE = .22839, df = 36. Red numbers are those which are significant (*p*<.05).

Appendix XXIII: Mean latency of the N190 component for each of the 96 conditions

Clothes Perspective WHR Electrode	N	Mean (ms)	Minimum	Maximum	SD
D F 0.6 A14	20	190.5722	168.3850	217.9100	14.49475
D F 0.6 A15	20	187.0064	166.4040	217.9100	14.34867
D F 0.6 A16	20	183.6387	162.4420	217.9100	14.53033
D F 0.6 A27	20	189.9779	170.3660	217.9100	14.83698
D F 0.6 A28	20	188.3931	168.3850	217.9100	14.82305
D F 0.6 A29	20	184.7283	166.4040	217.9100	13.52581
D F 0.7 A14	20	187.0064	164.4230	206.0240	12.15066
D F 0.7 A15	20	183.9359	164.4230	206.0240	12.18249
D F 0.7 A16	20	180.3701	162.4420	198.1000	10.84039
D F 0.7 A27	20	188.0960	162.4420	217.9100	16.06128
D F 0.7 A28	20	186.3131	162.4420	217.9100	14.98347
D F 0.7 A29	20	182.6482	164.4230	202.0620	10.99410
D F 0.8 A14	20	189.9779	158.4800	217.9100	14.57008
D F 0.8 A15	20	185.3226	158.4800	217.9100	15.31073
D F 0.8 A16	20	182.8463	160.4610	217.9100	15.44003
D F 0.8 A27	20	189.5817	166.4040	217.9100	14.74201
D F 0.8 A28	20	186.6102	166.4040	217.9100	14.70695
D F 0.8 A29	20	182.0539	168.3850	217.9100	11.91897
D F 0.9 A14	20	190.4732	168.3850	217.9100	12.72969
D F 0.9 A15	20	186.8083	166.4040	217.9100	12.56352
D F 0.9 A16	20	184.0349	164.4230	217.9100	12.91694
D F 0.9 A27	20	191.5627	166.4040	217.9100	14.57292
D F 0.9 A28	20	187.6007	166.4040	217.9100	13.45270
D F 0.9 A29	20	185.4216	166.4040	217.9100	12.46946
D B 0.6 A14	20	188.7893	166.4040	217.9100	14.71397
D B 0.6 A15	20	186.6102	166.4040	217.9100	14.00189
D B 0.6 A16	20	182.4501	164.4230	217.9100	14.41330
D B 0.6 A27	20	188.5912	166.4040	217.9100	12.84800
D B 0.6 A28	20	187.2045	166.4040	217.9100	12.95845
D B 0.6 A29	20	183.8368	160.4610	217.9100	13.61295
D B 0.7 A14	20	186.5112	162.4420	217.9100	14.30362
D B 0.7 A15	20	184.3321	164.4230	217.9100	13.53497
D B 0.7 A16	20	180.8653	164.4230	213.9480	13.49868
D B 0.7 A27	20	186.6102	164.4230	217.9100	15.64601
D B 0.7 A28	20	184.9264	162.4420	217.9100	15.79938
D B 0.7 A29	20	182.4501	164.4230	217.9100	13.18597
D B 0.8 A14	20	190.6713	164.4230	217.9100	12.55982
D B 0.8 A15	20	186.8083	164.4230	217.9100	13.78633
D B 0.8 A16	20	184.4311	164.4230	217.9100	14.15301
D B 0.8 A27	20	192.1570	168.3850	217.9100	14.34291
D B 0.8 A28	20	186.9074	162.4420	217.9100	13.31651
D B 0.8 A29	20	184.0349	164.4230	213.9480	13.04423
D B 0.9 A14	20	189.7798	168.3850	217.9100	14.03136
D B 0.9 A15	20	187.1055	168.3850	217.9100	12.45412
D B 0.9 A16	20	182.6482	166.4040	217.9100	13.11844

D B 0.9 A27	20	189.8789	168.3850	217.9100	14.31805
D B 0.9 A28	20	186.7093	168.3850	217.9100	11.95315
D B 0.9 A29	20	185.4216	168.3850	217.9100	12.13365
N F 0.6 A14	20	187.6998	164.4230	217.9100	13.35678
N F 0.6 A15	20	185.3226	164.4230	217.9100	14.24864
N F 0.6 A16	20	181.7568	160.4610	217.9100	14.80876
N F 0.6 A27	20	187.5017	164.4230	217.9100	14.20218
N F 0.6 A28	20	184.8273	164.4230	217.9100	14.19963
N F 0.6 A29	20	182.0539	162.4420	208.0050	12.65851
N F 0.7 A14	20	185.9169	160.4610	217.9100	14.99450
N F 0.7 A15	20	183.7378	160.4610	217.9100	14.42727
N F 0.7 A16	20	180.5682	158.4800	217.9100	13.60802
N F 0.7 A27	20	188.2941	162.4420	217.9100	15.52508
N F 0.7 A28	20	184.4311	162.4420	213.9480	13.04423
N F 0.7 A29	20	182.4501	162.4420	209.9860	12.88492
N F 0.8 A14	20	188.5912	162.4420	217.9100	14.59416
N F 0.8 A15	20	185.0254	162.4420	217.9100	15.24212
N F 0.8 A16	20	181.2615	162.4420	209.9860	13.08534
N F 0.8 A27	20	187.9969	164.4230	217.9100	14.68305
N F 0.8 A28	20	185.4216	164.4230	213.9480	13.05215
N F 0.8 A29	20	181.2615	164.4230	202.0620	11.39811
N F 0.9 A14	20	189.2846	166.4040	217.9100	15.63115
N F 0.9 A15	20	186.0159	162.4420	217.9100	15.68951
N F 0.9 A16	20	181.3606	162.4420	217.9100	15.02477
N F 0.9 A27	20	189.5817	162.4420	213.9480	14.89533
N F 0.9 A28	20	185.5207	162.4420	211.9670	13.87854
N F 0.9 A29	20	180.9644	160.4610	198.1000	10.96918
N B 0.6 A14	20	187.6998	166.4040	217.9100	14.58390
N B 0.6 A15	20	184.7283	166.4040	217.9100	14.89221
N B 0.6 A16	20	180.3701	162.4420	217.9100	15.72337
N B 0.6 A27	20	188.1950	166.4040	217.9100	13.04582
N B 0.6 A28	20	185.7188	166.4040	217.9100	13.09126
N B 0.6 A29	20	181.7568	164.4230	198.1000	10.94279
N B 0.7 A14	20	186.2140	162.4420	217.9100	15.88705
N B 0.7 A15	20	183.3416	162.4420	217.9100	14.60654
N B 0.7 A16	20	181.7568	162.4420	217.9100	15.24855
N B 0.7 A27	20	187.2045	160.4610	217.9100	15.91952
N B 0.7 A28	20	182.3511	160.4610	209.9860	11.34317
N B 0.7 A29	20	180.1720	158.4800	200.0810	11.84204
N B 0.8 A14	20	186.8083	164.4230	217.9100	15.52009
N B 0.8 A15	20	181.8558	162.4420	217.9100	14.72098
N B 0.8 A16	20	179.1815	160.4610	211.9670	14.00004
N B 0.8 A27	20	187.7988	158.4800	217.9100	14.35155
N B 0.8 A28	20	185.6197	160.4610	217.9100	14.12672
N B 0.8 A29	20	183.1435	162.4420	204.0430	12.42091
N B 0.9 A14	20	186.9074	170.3660	211.9670	12.58282
N B 0.9 A15	20	184.1340	168.3850	213.9480	13.71687

N B 0.9 A16	20	180.4691	164.4230	209.9860	13.43426
N B 0.9 A27	20	187.0064	166.4040	217.9100	13.95460
N B 0.9 A28	20	185.7188	166.4040	217.9100	14.07948
N B 0.9 A29	20	181.0634	166.4040	208.0050	11.10253

Appendix XXIV: Mean latency of the N190 component with WHR, perspective, clothes and their interaction

WHR	Perspective	Clothes	Mean	SE	-95.00%	95.00%	N
0.6			185.8095	11.96561	160.6707	210.9484	20
0.7			184.1876	11.40176	160.2334	208.1418	20
0.8			185.6403	11.86896	160.7046	210.5761	20
0.9			186.0613	11.23982	162.4473	209.6753	20
	Front		185.6630	16.34541	151.3226	220.0035	20
	Back		185.1864	16.50755	150.5053	219.8674	20
		Dressed	186.3481	16.50447	151.6735	221.0227	20
		Naked	184.5013	16.29477	150.2672	218.7353	20
0.6	Front		186.1232	8.822954	167.5869	204.6595	20
0.7	Front		184.4806	7.763318	168.1705	200.7908	20
0.8	Front		185.4959	8.533946	167.5667	203.4250	20
0.9	Front		186.5524	8.052892	169.6339	203.4709	20
0.6	Back		185.4959	8.329939	167.9953	202.9964	20
0.7	Back		183.8946	8.835609	165.3317	202.4575	20
0.8	Back		185.7848	8.473767	167.9821	203.5875	20
0.9	Back		185.5702	8.178042	168.3887	202.7516	20
0.6		Dressed	186.8166	8.814074	168.2989	205.3342	20
0.7		Dressed	184.5054	8.077289	167.5356	201.4751	20
0.8		Dressed	186.7835	8.510410	168.9038	204.6632	20
0.9		Dressed	187.2870	8.185104	170.0908	204.4833	20
0.6		Naked	184.8025	8.256021	167.4573	202.1478	20
0.7		Naked	183.8698	8.245930	166.5458	201.1939	20
0.8		Naked	184.4971	8.412806	166.8225	202.1718	20
0.9		Naked	184.8356	8.051177	167.9207	201.7504	20
0.6	Front	Dressed	187.3861	6.741076	173.2236	201.5486	20
0.7	Front	Dressed	184.7283	5.570464	173.0251	196.4314	20
0.8	Front	Dressed	186.0654	6.171806	173.0989	199.0319	20
0.9	Front	Dressed	187.6502	5.875745	175.3057	199.9947	20
0.6	Back	Dressed	186.2470	5.929013	173.7906	198.7034	20
0.7	Back	Dressed	184.2825	6.368894	170.9020	197.6631	20
0.8	Back	Dressed	187.5017	6.099749	174.6866	200.3167	20
0.9	Back	Dressed	186.9239	5.943810	174.4364	199.4113	20
0.6	Front	Naked	184.8603	6.024765	172.2028	197.5179	20
0.7	Front	Naked	184.2330	5.947095	171.7386	196.7274	20
0.8	Front	Naked	184.9264	6.051304	172.2130	197.6397	20
0.9	Front	Naked	185.4546	5.851841	173.1604	197.7489	20
0.6	Back	Naked	184.7448	5.981471	172.1782	197.3114	20
0.7	Back	Naked	183.5066	6.365513	170.1332	196.8801	20

0.8	**Back**	**Naked**	184.0679	6.006735	171.4482	196.6876	20
0.9	**Back**	**Naked**	184.2165	6.003664	171.6033	196.8297	20

Appendix XXV: Electrophysiological results - latency of N190: Post hoc Test of Tukey HSD for WHR

		1	2	3	4
Cell No.	**WHR**	**{185.81}**	**{184.19}**	**{185.64}**	**{186.06}**
1	**0.6**		0.011613	0.986941	0.959061
2	**0.7**	0.011613		0.028436	0.002779
3	**0.8**	0.986941	0.028436		0.838049
4	**0.9**	0.959061	0.002779	0.838049	

Error: Within MSE = 61.122, df = 54. Red numbers are those which are significant (*p*<.05).

Appendix XXVI: Electrophysiological results – latency of N190: output of the Post hoc Test of Tukey HSD for Electrode

		1	2	3
Cell No.	**Pairs of electrodes**	**{188.53}**	**{185.51}**	**{182.23}**
1	**A14/A27**	0.000515	0.000515	0.000127
2	**A15/A28**	0.000127		0.000252
3	**A16/A29**		0.000252	

Error: Within MSE = 161.06, df = 36. Red numbers are those which are significant (*p*<.05).

Appendix XXVII: Mean amplitude of the P1 component for each of the 128 conditions

Clothes Perspective WHR Electrode	N	Mean (μV)	Minimum	Maximum	SD
D F 0.6 D32	20	3.744099	0.24148	7.67021	1.736285
D F 0.6 A10	20	6.178611	1.84206	11.33733	2.744704
D F 0.6 A11	20	5.683108	1.16027	10.04558	2.539366
D F 0.6 A12	20	5.197975	0.61986	9.20113	2.499502
D F 0.6 B10	20	4.697010	0.95674	11.30001	2.353786
D F 0.6 B7	20	7.573410	2.23706	14.48517	3.085287
D F 0.6 B8	20	6.461889	2.24456	14.14396	2.874053
D F 0.6 B9	20	5.504376	1.89708	11.47102	2.611053
D F 0.7 D32	20	4.171065	-0.27462	7.23757	1.809711
D F 0.7 A10	20	6.400700	1.92673	11.54076	2.625936
D F 0.7 A11	20	6.162719	0.77617	11.45240	2.928657
D F 0.7 A12	20	5.460920	-0.38421	10.18501	2.824246
D F 0.7 B10	20	4.800501	1.28973	11.78978	2.257579
D F 0.7 B7	20	7.748782	3.41540	14.20550	2.916862
D F 0.7 B8	20	6.680967	3.28777	14.15738	2.759970
D F 0.7 B9	20	5.442975	1.20722	11.17517	2.469219
D F 0.8 D32	20	3.919095	-0.37911	7.30003	1.946047
D F 0.8 A10	20	6.106133	2.39394	11.57708	2.405477
D F 0.8 A11	20	5.879388	0.74313	10.17679	2.693118
D F 0.8 A12	20	5.162909	-0.15478	9.04486	2.471373
D F 0.8 B10	20	4.532621	1.95713	11.36836	2.258754

D F 0.8 B7	20	7.598519	3.37714	13.83184	3.088932
D F 0.8 B8	20	6.662646	3.27601	13.80306	2.890267
D F 0.8 B9	20	5.492770	1.62512	10.88233	2.616395
D F 0.9 D32	20	3.776123	-0.28656	7.97213	1.944962
D F 0.9 A10	20	6.217013	1.82995	11.73068	2.795601
D F 0.9 A11	20	5.752268	0.87895	10.44738	2.808842
D F 0.9 A12	20	5.311526	0.33905	9.28518	2.756754
D F 0.9 B10	20	4.830263	0.59959	9.60683	2.296637
D F 0.9 B7	20	7.971072	2.61447	14.54519	3.376650
D F 0.9 B8	20	7.032246	2.08068	14.01151	3.467551
D F 0.9 B9	20	5.771490	1.38208	11.59328	2.961919
D B 0.6 D32	20	3.745719	-1.08239	8.22283	2.182786
D B 0.6 A10	20	5.799992	0.76886	11.86383	2.934923
D B 0.6 A11	20	5.480579	0.14521	11.33147	3.008363
D B 0.6 A12	20	5.044305	-0.21331	10.12697	2.909415
D B 0.6 B10	20	4.575711	0.32778	11.04669	2.242116
D B 0.6 B7	20	7.559071	2.97081	14.88558	3.478879
D B 0.6 B8	20	6.609987	2.11035	14.78187	3.104550
D B 0.6 B9	20	5.555480	1.36722	12.02920	2.653422
D B 0.7 D32	20	4.111787	0.58773	8.57871	1.966059
D B 0.7 A10	20	6.074228	2.58561	12.32842	2.652657
D B 0.7 A11	20	5.969011	1.78934	11.13634	2.756648
D B 0.7 A12	20	5.305866	1.20589	9.89608	2.582658
D B 0.7 B10	20	5.002023	0.61090	12.94146	2.625913
D B 0.7 B7	20	7.784940	2.78955	15.47310	3.209464
D B 0.7 B8	20	7.052202	2.86626	15.47391	2.972892
D B 0.7 B9	20	5.902307	1.61066	13.54269	2.785672
D B 0.8 D32	20	3.784269	0.42020	7.26973	1.938138
D B 0.8 A10	20	5.780237	1.58421	11.09180	2.684327
D B 0.8 A11	20	5.657354	1.19163	9.49678	2.694250
D B 0.8 A12	20	5.310984	0.91807	9.81587	2.709549
D B 0.8 B10	20	4.946327	0.86494	12.79163	2.436466
D B 0.8 B7	20	7.719671	2.18864	16.07925	3.184029
D B 0.8 B8	20	6.957180	2.17118	16.08835	3.212980
D B 0.8 B9	20	5.890314	1.89631	14.35628	2.952766
D B 0.9 D32	20	3.964717	0.53162	9.07472	2.022106
D B 0.9 A10	20	6.310730	2.58785	12.46467	2.558883
D B 0.9 A11	20	6.038009	2.07636	10.78391	2.881191
D B 0.9 A12	20	5.351182	1.03638	9.94513	2.824827
D B 0.9 B10	20	5.026849	0.99947	10.66582	2.119324
D B 0.9 B7	20	7.829153	2.30921	14.25859	2.814365
D B 0.9 B8	20	6.935828	2.33503	13.52783	2.680807
D B 0.9 B9	20	5.869443	2.23766	11.71390	2.574887
N F 0.6 D32	20	3.826853	0.10269	7.33857	1.990970
N F 0.6 A10	20	6.154749	0.79948	10.58312	2.983293
N F 0.6 A11	20	5.993896	0.60031	10.79334	3.149472
N F 0.6 A12	20	5.373092	0.57657	9.94855	3.005918

N F 0.6 B10	20	4.750653	1.15193	10.46225	2.395259
N F 0.6 B7	20	7.709321	2.65397	16.02730	3.575765
N F 0.6 B8	20	6.714028	2.56219	15.95024	3.224669
N F 0.6 B9	20	5.671202	2.16208	12.06284	2.781505
N F 0.7 D32	20	4.149050	1.08686	9.64102	1.954106
N F 0.7 A10	20	6.374046	2.78430	13.53387	2.860994
N F 0.7 A11	20	6.001783	2.36121	10.47046	2.810586
N F 0.7 A12	20	5.459950	1.08861	10.16373	2.638727
N F 0.7 B10	20	5.067433	0.35857	11.69843	2.728481
N F 0.7 B7	20	7.688143	2.43140	15.97689	3.426310
N F 0.7 B8	20	6.693129	2.25559	16.03024	3.299402
N F 0.7 B9	20	5.722169	0.91630	13.08898	2.977145
N F 0.8 D32	20	4.156305	1.08681	8.50199	1.801456
N F 0.8 A10	20	6.279166	2.11982	12.92050	2.860148
N F 0.8 A11	20	6.079610	1.57992	10.10450	2.812477
N F 0.8 A12	20	5.522754	0.61409	9.91804	2.802760
N F 0.8 B10	20	5.232327	0.88988	10.65310	2.366801
N F 0.8 B7	20	8.160563	2.49730	15.70700	3.450595
N F 0.8 B8	20	6.998912	2.41531	15.65525	3.230523
N F 0.8 B9	20	5.950815	1.19442	11.76061	2.920181
N F 0.9 D32	20	4.006171	1.20163	6.73582	1.874671
N F 0.9 A10	20	6.179958	2.64697	10.64756	2.536367
N F 0.9 A11	20	5.901418	2.16037	11.80365	3.030150
N F 0.9 A12	20	5.279222	1.38173	10.13966	2.791461
N F 0.9 B10	20	4.857381	0.27527	9.83704	2.425350
N F 0.9 B7	20	7.650410	2.36903	14.86133	3.486245
N F 0.9 B8	20	6.687663	1.58314	14.91758	3.411138
N F 0.9 B9	20	5.532764	1.06466	11.95268	2.866151
N B 0.6 D32	20	3.861085	0.13714	7.42646	1.861589
N B 0.6 A10	20	5.773033	1.42591	10.10972	2.538357
N B 0.6 A11	20	5.841261	0.65977	10.68700	2.972471
N B 0.6 A12	20	5.289896	0.25103	9.66962	2.755497
N B 0.6 B10	20	5.262514	0.81427	12.58023	2.728465
N B 0.6 B7	20	7.726394	2.33887	15.61086	3.612122
N B 0.6 B8	20	6.726913	2.10841	14.40392	3.343573
N B 0.6 B9	20	5.722306	1.53790	12.64655	3.023134
N B 0.7 D32	20	4.356243	0.01077	8.10297	2.029707
N B 0.7 A10	20	6.201856	1.49143	10.86245	2.748394
N B 0.7 A11	20	5.875208	0.72187	12.06313	3.035017
N B 0.7 A12	20	5.357423	-0.30589	9.18801	2.882341
N B 0.7 B10	20	4.930671	1.69951	10.48419	2.314398
N B 0.7 B7	20	7.567252	2.15178	15.93547	3.512017
N B 0.7 B8	20	6.777389	2.00700	14.16300	3.357419
N B 0.7 B9	20	5.790700	2.12114	12.55393	2.974933
N B 0.8 D32	20	3.861002	-0.48223	7.62080	2.172486
N B 0.8 A10	20	5.704030	0.03620	11.09940	3.057386
N B 0.8 A11	20	5.838149	0.84310	11.01381	3.113994

N B 0.8 A12	20	5.452964	0.35282	9.47208	3.044507
N B 0.8 B10	20	5.087700	0.43243	11.38743	2.479200
N B 0.8 B7	20	7.612293	1.83607	16.80170	3.840315
N B 0.8 B8	20	6.903462	1.88241	14.55110	3.137092
N B 0.8 B9	20	6.212750	1.36582	12.34032	2.859649
N B 0.9 D32	20	3.847850	-0.14386	7.37483	2.073739
N B 0.9 A10	20	5.504372	1.37493	10.67938	2.711938
N B 0.9 A11	20	5.748825	0.42292	11.54726	3.317181
N B 0.9 A12	20	5.329003	0.31560	9.89204	2.937078
N B 0.9 B10	20	5.061650	0.06781	10.96836	2.778385
N B 0.9 B7	20	7.422127	2.70586	15.42021	3.767138
N B 0.9 B8	20	6.759064	1.58074	13.83284	3.242545
N B 0.9 B9	20	5.958056	1.14085	11.88293	2.994482

Appendix XXVIII: Mean amplitude of the P1 component with WHR, perspective, clothes and their interaction

WHR	Perspective	Clothes	Mean	SE	-95.00%	95.00%	N
0.6			5.681516	2.937904	-0.490791	11.85382	20
0.7			5.877607	2.896701	-0.208135	11.96335	20
0.8			5.826663	2.915443	-0.298456	11.95178	20
0.9			5.803558	2.966366	-0.428545	12.03566	20
	Front		5.808596	4.034659	-2.66791	14.28510	20
	Back		5.786076	4.205515	-3.04938	14.62153	20
		Dressed	5.763604	3.992761	-2.62488	14.15208	20
		Naked	5.831068	4.260138	-3.11915	14.78129	20
0.6	**Front**		5.702142	2.028731	1.439936	9.96435	20
0.7	**Front**		5.876521	2.033975	1.603298	10.14974	20
0.8	**Front**		5.858408	1.975306	1.708444	10.00837	20
0.9	**Front**		5.797312	2.154584	1.270698	10.32393	20
0.6	**Back**		5.660890	2.142540	1.159580	10.16220	20
0.7	**Back**		5.878694	2.098861	1.469151	10.28824	20
0.8	**Back**		5.794918	2.183693	1.207149	10.38269	20
0.9	**Back**		5.809803	2.076124	1.448029	10.17158	20
0.6		**Dressed**	5.588208	1.993768	1.399456	9.77696	20
0.7		**Dressed**	5.879437	2.040075	1.593398	10.16548	20
0.8		**Dressed**	5.712526	2.011305	1.486931	9.93812	20
0.9		**Dressed**	5.874244	2.035736	1.597321	10.15117	20
0.6		**Naked**	5.774825	2.210609	1.130509	10.41914	20
0.7		**Naked**	5.875778	2.098207	1.467608	10.28395	20
0.8		**Naked**	5.940800	2.136676	1.451811	10.42979	20
0.9		**Naked**	5.732871	2.195575	1.120139	10.34560	20
0.6	**Front**	**Dressed**	5.630060	1.344671	2.805011	8.455109	20
0.7	**Front**	**Dressed**	5.858579	1.429060	2.856234	8.860923	20
0.8	**Front**	**Dressed**	5.669260	1.379548	2.770938	8.567583	20
0.9	**Front**	**Dressed**	5.832750	1.547984	2.580556	9.084944	20
0.6	**Back**	**Dressed**	5.546355	1.521344	2.350130	8.742581	20

0.7	**Back**	**Dressed**	5.900295	1.481389	2.788012	9.012578	20
0.8	**Back**	**Dressed**	5.755792	1.524236	2.553492	8.958092	20
0.9	**Back**	**Dressed**	5.915739	1.375402	3.026127	8.805351	20
0.6	**Front**	**Naked**	5.774224	1.594486	2.424333	9.124116	20
0.7	**Front**	**Naked**	5.894463	1.501064	2.740843	9.048082	20
0.8	**Front**	**Naked**	6.047556	1.486551	2.924429	9.170684	20
0.9	**Front**	**Naked**	5.761873	1.533305	2.540520	8.983227	20
0.6	**Back**	**Naked**	5.775425	1.567053	2.483169	9.067681	20
0.7	**Back**	**Naked**	5.857092	1.566619	2.565747	9.148438	20
0.8	**Back**	**Naked**	5.834044	1.591729	2.489946	9.178142	20
0.9	**Back**	**Naked**	5.703868	1.618683	2.303142	9.104595	20

Appendix XXIX: Electrophysiological results - amplitude of P1: Post hoc Test of Tukey HSD for Electrode

		1	2	3	4
Cell No.	**Pairs of electrodes**	**{4.4357}**	**{6.8862}**	**{6.3299}**	**{5.5375}**
1	**D32/B10**		0.000161	0.000161	0.000800
2	**A10/B7**	0.000161		0.167908	0.000184
3	**A11/B8**	0.000161	0.167908		0.021664
4	**A12/B9**	0.000800	0.000184	0.021664	

Error: Within MSE = 22.573, df = 54. Red numbers are those which are significant (*p*<.05).

Appendix XXX: Electrophysiological results - amplitude of P1: Post hoc Test of Tukey HSD for WHR x Gender

			1	2	3	4	5	6	7	8
Cell No.	**Gender**	**WHR**	**{6.119}**	**{6.0457}**	**{6.2595}**	**{6.222}**	**{5.2441}**	**{5.7095}**	**{5.3938}**	**{5.3852}**
1	**Female**	**0.6**		0.999457	0.968995	0.994972	0.987690	0.999901	0.995967	0.995667
2	**Female**	**0.7**	0.999457		0.774079	0.901731	0.992606	0.999974	0.997931	0.997746
3	**Female**	**0.8**	0.968995	0.774079		0.999994	0.971823	0.999307	0.988421	0.987732
4	**Female**	**0.9**	0.994972	0.901731	0.999994		0.977019	0.999562	0.991048	0.990491
5	**Male**	**0.6**	0.987690	0.992606	0.971823	0.977019		0.027192	0.956519	0.968365
6	**Male**	**0.7**	0.999901	0.999974	0.999307	0.999562	0.027192		0.314735	0.282461
7	**Male**	**0.8**	0.995967	0.997931	0.988421	0.991048	0.956519	0.314735		1.000000
8	**Male**	**0.9**	0.995667	0.997746	0.987732	0.990491	0.968365	0.282461	1.000000	

Error: Between; Within; Pooled MSE = 5.3627, df = 18.484. Red numbers are those which are significant (*p*<.05).

Appendix XXXI: Electrophysiological results - amplitude of P1: Post hoc Test of Tukey HSD for Clothes x Electrode

			1	2	3	4	5	6	7	8
Cell No.	Clothes	Pairs of electrodes	{4.3518}	{6.9158}	{6.3135}	{5.4734}	{4.5197}	{6.8567}	{6.3463}	{5.6016}
1	Dressed	D32/B10		0.000134	0.000134	0.000134	0.008079	0.000134	0.000134	0.000134
2	Dressed	A10/B7	0.000134		0.000134	0.000134	0.000134	0.879369	0.000134	0.000134
3	Dressed	A11/B8	0.000134	0.000134		0.000134	0.000134	0.000134	0.995131	0.000134
4	Dressed	A12/B9	0.000134	0.000134	0.000134		0.000134	0.000134	0.000134	0.091021
5	Naked	D32/B10	0.008079	0.000134	0.000134	0.000134		0.000134	0.000134	0.000134
6	Naked	A10/B7	0.000134	0.879369	0.000134	0.000134	0.000134		0.000134	0.000134
7	Naked	A11/B8	0.000134	0.000134	0.995131	0.000134	0.000134	0.000134		0.000134
8	Naked	A12/B9	0.000134	0.000134	0.000134	0.091021	0.000134	0.000134	0.000134	

Error: Within MSE =.31065, df =54. Red numbers are those which are significant (*p*<.05).

Appendix XXXII: Electrophysiological results - amplitude of P1: Post hoc Test of Tukey HSD for Perspective x Hemisphere

			1	2	3	4
Cell No.	Perspective	Hemisphere	{5.3707}	{6.2465}	{5.2366}	{6.3356}
1	Front	Left		0.000179	0.122557	0.000179
2	Front	Right	0.000179		0.000179	0.422733
3	Back	Left	0.122557	0.000179		0.000179
4	Back	Right	0.000179	0.422733	0.000179	

Error: Within MSE = 1.0372, df = 18. Red numbers are those which are significant (*p*<.05).

Appendix XXXIII: Electrophysiological results - amplitude of P1: Post hoc Test of Tukey HSD for Perspective x Electrode

			1	2	3	4	5	6	7	8
Cell No.	Perspective	Electrodes	{4.4073}	{6.9994}	{6.3366}	{5.4911}	{4.4641}	{6.7731}	{6.3232}	{5.5839}
1	Front	D32/B10		0.000134	0.000134	0.000134	0.883630	0.000134	0.000134	0.000134
2	Front	A10 /B7	0.000134		0.000134	0.000134	0.000134	0.000182	0.000134	0.000134
3	Front	A11/B8	0.000134	0.000134		0.000134	0.000134	0.000134	0.999984	0.000134
4	Front	A12/B9	0.000134	0.000134	0.000134		0.000134	0.000134	0.000134	0.384129
5	Back	D32/B10	0.883630	0.000134	0.000134	0.000134		0.000134	0.000134	0.000134
6	Back	A10/B7	0.000134	0.000182	0.000134	0.000134	0.000134		0.000134	0.000134
7	Back	A11/B8	0.000134	0.000134	0.999984	0.000134	0.000134	0.000134		0.000134
8	Back	A12/B9	0.000134	0.000134	0.000134	0.384129	0.000134	0.000134	0.000134	

Error: Within MSE =.29239, df = 54. Red numbers are those which are significant (*p*<.05).

Appendix XXXIV: Electrophysiological results - amplitude of P1: Post hoc Test of Tukey HSD for Hemisphere x Gender

			1	2	3	4
Cell No.	**Gender**	**Hemisphere**	**{5.0206}**	**{7.3025}**	**{5.5867}**	**{5.2796}**
1	**Female**	**Left**		0.007992	0.956739	0.995559
2	**Female**	**Right**	0.007992		0.432397	0.292560
3	**Male**	**Left**	0.956739	0.432397		0.958151
4	**Male**	**Right**	0.995559	0.292560	0.958151	

Error: Between; Within; Pooled MSE = 6.2358, df = 24.224. Red numbers are those which are significant (p<.05).

Appendix XXXV: Mean latency of the P1 component for each of the 128 conditions

Clothes Perspective WHR Electrode	N	Mean (ms)	Minimum	Maximum	SD
D F 0.6 D32	20	146.6931	122.8220	158.4800	9.90448
D F 0.6 A10	20	145.3064	122.8220	162.4420	10.96918
D F 0.6 A11	20	147.1883	128.7650	162.4420	10.38547
D F 0.6 A12	20	147.4855	128.7650	162.4420	10.06993
D F 0.6 B10	20	143.6225	122.8220	156.4990	9.69423
D F 0.6 B7	20	143.7216	128.7650	160.4610	8.96302
D F 0.6 B8	20	144.7121	122.8220	160.4610	10.53112
D F 0.6 B9	20	145.0092	122.8220	162.4420	11.32722
D F 0.7 D32	20	148.1788	122.8220	162.4420	11.25405
D F 0.7 A10	20	145.9007	128.7650	162.4420	10.04528
D F 0.7 A11	20	147.3864	132.7270	162.4420	9.00727
D F 0.7 A12	20	149.3674	134.7080	162.4420	8.63259
D F 0.7 B10	20	144.7121	122.8220	156.4990	8.75317
D F 0.7 B7	20	143.6225	122.8220	160.4610	10.68736
D F 0.7 B8	20	145.5045	122.8220	160.4610	10.41278
D F 0.7 B9	20	147.0893	122.8220	162.4420	9.50869
D F 0.8 D32	20	147.6836	130.7460	162.4420	8.65827
D F 0.8 A10	20	143.5235	122.8220	162.4420	9.92531
D F 0.8 A11	20	146.1978	128.7650	162.4420	8.04301
D F 0.8 A12	20	147.3864	128.7650	162.4420	7.82960
D F 0.8 B10	20	144.4149	124.8030	162.4420	10.13993
D F 0.8 B7	20	143.9197	124.8030	162.4420	10.38895
D F 0.8 B8	20	144.3159	124.8030	160.4610	9.77433
D F 0.8 B9	20	144.7121	124.8030	162.4420	10.27299
D F 0.9 D32	20	146.5940	122.8220	162.4420	12.14386
D F 0.9 A10	20	144.4149	122.8220	162.4420	11.74440
D F 0.9 A11	20	146.5940	122.8220	162.4420	11.51530
D F 0.9 A12	20	146.9902	122.8220	162.4420	11.79179
D F 0.9 B10	20	145.4054	122.8220	162.4420	10.95269
D F 0.9 B7	20	146.2969	124.8030	162.4420	10.70232
D F 0.9 B8	20	145.9997	124.8030	162.4420	10.83324
D F 0.9 B9	20	144.3159	122.8220	162.4420	12.25012
D B 0.6 D32	20	144.2168	122.8220	160.4610	11.39993

D B 0.6 A10	20	142.7311	122.8220	160.4610	10.74470
D B 0.6 A11	20	145.1083	122.8220	160.4610	9.65955
D B 0.6 A12	20	145.3064	122.8220	156.4990	9.25329
D B 0.6 B10	20	146.0988	122.8220	162.4420	11.65569
D B 0.6 B7	20	146.6931	122.8220	162.4420	10.25286
D B 0.6 B8	20	145.3064	122.8220	162.4420	11.22970
D B 0.6 B9	20	146.1978	122.8220	162.4420	11.12483
D B 0.7 D32	20	145.5045	122.8220	162.4420	13.62622
D B 0.7 A10	20	144.7121	122.8220	162.4420	12.66789
D B 0.7 A11	20	144.3159	122.8220	162.4420	12.63197
D B 0.7 A12	20	146.3959	122.8220	162.4420	11.13040
D B 0.7 B10	20	145.8016	122.8220	162.4420	11.23200
D B 0.7 B7	20	145.5045	124.8030	162.4420	11.14107
D B 0.7 B8	20	147.0893	124.8030	162.4420	10.63650
D B 0.7 B9	20	146.7921	124.8030	162.4420	11.11183
D B 0.8 D32	20	145.9007	122.8220	162.4420	11.10021
D B 0.8 A10	20	142.0377	124.8030	162.4420	10.20491
D B 0.8 A11	20	145.3064	122.8220	162.4420	10.83657
D B 0.8 A12	20	144.4149	124.8030	162.4420	10.51984
D B 0.8 B10	20	144.8111	122.8220	162.4420	11.01850
D B 0.8 B7	20	144.7121	124.8030	162.4420	10.93524
D B 0.8 B8	20	143.8206	126.7840	162.4420	10.19073
D B 0.8 B9	20	144.5140	122.8220	162.4420	11.46992
D B 0.9 D32	20	146.3959	128.7650	160.4610	9.17765
D B 0.9 A10	20	144.1178	128.7650	160.4610	9.13196
D B 0.9 A11	20	145.9997	126.7840	158.4800	8.67317
D B 0.9 A12	20	145.8016	126.7840	160.4610	9.00727
D B 0.9 B10	20	146.4950	124.8030	162.4420	9.45642
D B 0.9 B7	20	145.2073	126.7840	160.4610	9.11441
D B 0.9 B8	20	144.9102	126.7840	158.4800	8.50908
D B 0.9 B9	20	146.1978	126.7840	162.4420	8.89653
N F 0.6 D32	20	143.8206	122.8220	162.4420	12.13365
N F 0.6 A10	20	142.0377	122.8220	162.4420	12.23030
N F 0.6 A11	20	142.8301	124.8030	162.4420	11.33269
N F 0.6 A12	20	145.4054	122.8220	162.4420	11.54038
N F 0.6 B10	20	144.1178	122.8220	162.4420	10.86703
N F 0.6 B7	20	143.6225	122.8220	158.4800	10.00872
N F 0.6 B8	20	142.9292	122.8220	158.4800	10.34911
N F 0.6 B9	20	144.6130	122.8220	160.4610	10.18262
N F 0.7 D32	20	143.4244	122.8220	158.4800	10.85800
N F 0.7 A10	20	141.9387	122.8220	160.4610	11.57389
N F 0.7 A11	20	142.4339	122.8220	158.4800	10.73364
N F 0.7 A12	20	142.6320	124.8030	158.4800	9.85273
N F 0.7 B10	20	142.2358	122.8220	162.4420	10.80460
N F 0.7 B7	20	142.4339	124.8030	158.4800	9.53093
N F 0.7 B8	20	143.1273	124.8030	158.4800	9.37746
N F 0.7 B9	20	143.0282	122.8220	160.4610	10.78547

N F 0.8 D32	20	145.1083	122.8220	162.4420	11.31399
N F 0.8 A10	20	142.9292	122.8220	160.4610	10.79839
N F 0.8 A11	20	144.3159	122.8220	160.4610	10.14757
N F 0.8 A12	20	145.0092	124.8030	158.4800	10.21502
N F 0.8 B10	20	145.4054	126.7840	160.4610	8.38991
N F 0.8 B7	20	142.9292	126.7840	162.4420	9.00441
N F 0.8 B8	20	143.1273	126.7840	162.4420	9.08661
N F 0.8 B9	20	144.1178	126.7840	162.4420	8.59602
N F 0.9 D32	20	143.5235	122.8220	162.4420	12.63524
N F 0.9 A10	20	141.4434	122.8220	160.4610	11.82328
N F 0.9 A11	20	142.3349	124.8030	160.4610	10.20845
N F 0.9 A12	20	142.2358	124.8030	160.4610	10.65057
N F 0.9 B10	20	141.4434	122.8220	160.4610	10.93382
N F 0.9 B7	20	142.3349	122.8220	156.4990	8.33744
N F 0.9 B8	20	139.7596	122.8220	156.4990	10.47212
N F 0.9 B9	20	142.5330	122.8220	160.4610	11.37952
N B 0.6 D32	20	143.0282	122.8220	162.4420	11.30897
N B 0.6 A10	20	140.7501	122.8220	156.4990	11.17809
N B 0.6 A11	20	141.5425	122.8220	162.4420	11.02927
N B 0.6 A12	20	142.3349	122.8220	162.4420	11.60953
N B 0.6 B10	20	143.0282	122.8220	158.4800	10.15418
N B 0.6 B7	20	142.0377	122.8220	158.4800	10.54337
N B 0.6 B8	20	142.3349	122.8220	158.4800	10.18820
N B 0.6 B9	20	143.0282	122.8220	162.4420	11.63308
N B 0.7 D32	20	142.2358	122.8220	158.4800	11.08764
N B 0.7 A10	20	140.6510	122.8220	160.4610	10.22311
N B 0.7 A11	20	142.4339	126.7840	162.4420	9.82964
N B 0.7 A12	20	143.0282	126.7840	160.4610	9.71764
N B 0.7 B10	20	143.2263	124.8030	160.4610	9.49184
N B 0.7 B7	20	141.6415	122.8220	158.4800	10.47261
N B 0.7 B8	20	142.2358	122.8220	160.4610	9.67504
N B 0.7 B9	20	142.8301	122.8220	162.4420	11.05593
N B 0.8 D32	20	142.8301	122.8220	162.4420	12.26066
N B 0.8 A10	20	140.8491	122.8220	158.4800	11.18594
N B 0.8 A11	20	144.7121	128.7650	162.4420	9.56500
N B 0.8 A12	20	144.6130	126.7840	162.4420	9.20237
N B 0.8 B10	20	142.5330	122.8220	162.4420	10.47212
N B 0.8 B7	20	142.0377	122.8220	156.4990	10.10320
N B 0.8 B8	20	144.5140	122.8220	158.4800	9.75741
N B 0.8 B9	20	145.9007	122.8220	162.4420	9.77433
N B 0.9 D32	20	142.4339	122.8220	160.4610	11.38724
N B 0.9 A10	20	139.1653	122.8220	160.4610	12.17571
N B 0.9 A11	20	142.8301	122.8220	160.4610	10.24127
N B 0.9 A12	20	143.3254	122.8220	160.4610	10.20845
N B 0.9 B10	20	145.1083	122.8220	162.4420	9.87106
N B 0.9 B7	20	142.1368	122.8220	154.5180	9.89196
N B 0.9 B8	20	143.1273	122.8220	162.4420	11.29572

N B 0.9 B9	20	145.0092	122.8220	162.4420	9.48096

Appendix XXXVI: Mean latency of the P1 component with WHR, perspective, clothes and their interaction

WHR	Perspective	Clothes	Mean	SE	-95.00%	95.00%	N
0.6			144.1518	11.48924	120.0138	168.2898	20
0.7			144.2942	10.70486	121.8041	166.7843	20
0.8			144.3313	10.41192	122.4567	166.2060	20
0.9			144.0775	10.70582	121.5854	166.5696	20
	Front		144.4288	14.69619	113.5533	175.3044	20
	Back		143.9986	15.59343	111.2380	176.7592	20
		Dressed	145.5106	14.71508	114.5954	176.4259	20
		Naked	142.9168	15.66688	110.0019	175.8317	20
0.6	Front		144.5697	8.121634	127.5067	161.6326	20
0.7	Front		144.5635	6.931977	129.9999	159.1270	20
0.8	Front		144.6935	6.954306	130.0830	159.3039	20
0.9	Front		143.8887	8.144922	126.7769	161.0005	20
0.6	Back		143.7339	8.209465	126.4865	160.9814	20
0.7	Back		144.0249	8.341092	126.5009	161.5489	20
0.8	Back		143.9692	8.085082	126.9830	160.9553	20
0.9	Back		144.2663	7.263207	129.0069	159.5258	20
0.6		Dressed	145.3373	7.715174	129.1283	161.5463	20
0.7		Dressed	146.1173	7.426938	130.5139	161.7207	20
0.8		Dressed	144.8544	7.606101	128.8746	160.8343	20
0.9		Dressed	145.7335	7.743046	129.4660	162.0010	20
0.6		Naked	142.9663	9.067945	123.9152	162.0173	20
0.7		Naked	142.4710	7.926192	125.8187	159.1234	20
0.8		Naked	143.8082	7.533581	127.9808	159.6357	20
0.9		Naked	142.4215	7.661681	126.3249	158.5181	20
0.6	Front	Dressed	145.4673	5.335602	134.2576	156.6770	20
0.7	Front	Dressed	146.4702	4.839110	136.3036	156.6368	20
0.8	Front	Dressed	145.2692	5.088813	134.5780	155.9604	20
0.9	Front	Dressed	145.8264	6.401935	132.3764	159.2763	20
0.6	Back	Dressed	145.2073	5.712408	133.2060	157.2086	20
0.7	Back	Dressed	145.7645	6.043730	133.0671	158.4619	20
0.8	Back	Dressed	144.4397	6.018799	131.7946	157.0847	20
0.9	Back	Dressed	145.6406	4.942103	135.2577	156.0236	20
0.6	Front	Naked	143.6720	6.521878	129.9701	157.3740	20
0.7	Front	Naked	142.6568	5.525066	131.0490	154.2645	20
0.8	Front	Naked	144.1178	5.240947	133.1069	155.1286	20
0.9	Front	Naked	141.9510	5.350037	130.7110	153.1910	20
0.6	Back	Naked	142.2606	6.392989	128.8294	155.6917	20
0.7	Back	Naked	142.2853	5.946072	129.7931	154.7776	20
0.8	Back	Naked	143.4987	5.775463	131.3649	155.6325	20
0.9	Back	Naked	142.8920	5.757232	130.7965	154.9875	20