

Research article

Avoiding minorities: Social invisibility

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Abstract

Three experiments examined how self-consciousness has an impact on the visual exploration of a social field. The main hypothesis was that merely a photograph of people can trigger a dynamic process of social visual interaction such that minority images are avoided when people are in a state of self-reflective consciousness. In all three experiments, pairs of pictures—one with characters of social minorities and one with characters of social majorities—were shown to the participants. By means of eye-tracking technology, the results of Experiment 1 (n = 20) confirmed the hypothesis that in the reflective consciousness condition, people look more at the majority than minority characters. The results of Experiment 2 (n = 89) confirmed the hypothesis that reflective consciousness also induces avoiding reciprocal visual interaction with minorities. Finally, by manipulating the visual interaction (direct vs. non-direct) with the photos of minority and majority characters, the results of Experiment 3 (n = 56) confirmed the hypothesis that direct visual interaction with minority characters is perceived as being longer and more aversive. The overall conclusion is that self-reflective consciousness leads people to avoid visual interaction with social minorities, consigning them to social invisibility. Copyright © 2012 John Wiley & Sons, Ltd.

Research into visual behaviour has a long history in psychology (e.g. Buswell, 1935; Cline, 1967; Gibson, 1963; Yarbus, 1967). However, recent advances in new technologies—such as eye tracking—have opened new possibilities for analyzing complex cognitive processes involved in visual behaviour. During the exploration of a visual scene, the eyes move about three or four times a second via saccadic eye movements. This movement process in gathering visual information is necessary to reorient the fovea through the scene. Eye fixations through a scene serve ongoing perceptual and cognitive activities (Henderson, 2003). Eye tracking provides a millisecond (non-conscious) record of these eye fixations (Duchowski, 2007), allowing us to test complex hypotheses concerning the relationships between cognitive processes and visual behaviour.

Many factors that drive the gaze have been studied (Calvo & Lang, 2004; Henderson, 2007; Henderson & Ferreira, 2004; Land & Hayhoe, 2001; Van Gompel, Fischer, Murray, & Hill, 2007). In a review of these studies, Henderson (2003) argued that the two main sources of information used to select specific scene areas for further scrutiny are stimulus-based information generated from the scene (i.e. colour, intensity, contrast, orientation, motion) and top-down, memory-based information generated from visual and cognitive systems (e.g. familiarity, characteristics of the perceiver in interaction with stimulus characteristics, expectations, emotional meaning; Calvo & Lang, 2004; Henderson, 2007; Henderson & Ferreira, 2004; Land & Hayhoe, 2001; Van Gompel et al., 2007). Both stimulus-based

information and cognitive knowledge structures used in a top-down manner affect how fixations are deployed in a scene (Parkhurst, Law, & Niebur, 2002).

At a second level of analysis, several studies have considered how looking at images with social content works. Indeed, the presence of specific people in the picture influences the exploration of the whole scene (Birmingham, Bischof, & Kingstone, 2009; Keysar, Barr, Balin, & Brauner, 2000; Zwickel & Vo, 2010). For instance, some studies have shown that when there is the presence of a person, the participants' gaze is directed sooner, more frequently, and for a longer amount of time to the person in the scene (Castellano, Wieth, & Henderson, 2007). Furthermore, Birmingham, Bischof, and Kingstone (2007) and Birmingham et al. (2009) found that fixations stay predominately on the region of the head.

The use of images with social content has become particularly relevant in the study of autism. A differential characteristic of autism is an impaired social interaction and communication, including less frequent eye contact and a worsened ability to differentiate between expressions and perceived emotion. By using eye tracking, some studies have shown that individuals with autism avoid looking at people in a scene and look less in the eyes of the people than non-autistic individuals (Boraston & Blakemore, 2007; Dawson, Meltzoff, Osterling, Rinaldi, & Brown, 1998; Klin, Jones, Schultz, Volkmar, & Cohen, 2002; Riby & Hancock, 2009; Sasson, 2006). Most of these studies have used static images, in which people are just photographed.

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Interestingly, despite being no more than photographs, it was found that visual performance is a function of the (virtual) social interaction between the participant (autistic vs. non-autistic) and the person shown in the picture. This is not a breakthrough for scholars of virtual reality. For instance, an experiment of Slater, Pertaub, Barker, and Clark (2006) involved people who were confident public speakers and people who were phobic. Half of each group spoke within a virtual environment depicting an empty seminar room and the other half within the same room but populated by a neutrally behaving virtual audience of five people. The people with phobia showed a significant increase in signs of anxiety when speaking to the virtual audience (even if they knew perfectly well that the observers were avatars) compared with the empty room, whereas the confident people did not show any difference in the two conditions.

Thus, autistic individuals avoid contact with people's eyes (even in a simple photograph), and phobics felt anxiety at having to speak to an audience even if they knew it was only made up of avatars. These studies suggested the main hypothesis—underlying the three experiments that will be presented in the succeeding texts—that a virtual social interaction (with the character of the photo) is induced when individuals look at pictures of people although they know they are only photographs. In psychological terms, this means that observers behave as if their gaze is not only used to seeing the others but also to communicate a sentiment of the perceiver to the observed people. In particular, we supposed that the way in which participants view the person they see in the image can be considered as an index of the (virtual) social interaction with that person. To our knowledge, no previous study on visual behaviour has considered this virtual social interaction hypothesis with images of people, even if they are only static pictures.

Social Influence on Visual Behaviour

In addition to the characteristics of the images that drive the gaze, the interaction or the eye contact with the reality around—albeit just virtual—is also regulated by social norms and conventions (Goffman, 1963). The gaze is ruled by a generalized other, by social norms that prescribe and proscribe how to focus on the other. We are all more or less socialized into ways of looking at others and this is linked to social categories differing according to gender, age, status, power and so on (Dovidio, Ellyson, Keating, Heltman, & Brown, 1988; Exline, Ellyson, & Long, 1975). We all know what an 'indiscreet look' or an 'evil eye' is. For instance, it is part of our education not to stare at people with physical stigma. There are situations in which not looking at another person is a sign of contempt and situations in which looking at the other is a sign of humiliation. These social conventions—concerning whom we should look at and whom it is commonly disapproved of to look at—are involved in the process of looking. Also, gaze duration seems regulated not only by the properties and complexity of the object but also by perceiver's social attitudes towards it. Some studies on attraction recurrently pointed out that staring straight into someone's eyes communicates intentions and sentiments to him or her (Henderson, Williams, & Falk, 2005; Kleinke, 1986).

However, despite all these studies, there remain other social meanings of gaze that are relatively little studied in psychology. For instance, the effect of social influence on visual behaviour

when people who look (i.e. the perceivers) while watching become aware that, in turn, they are being observed—whether by the observed person (i.e. reciprocal interaction) or by a third person in the scene. Following the tradition of symbolic interactionism (Mead, 1934), Jean-Paul Sartre (1943) pointed out two states of consciousness (non-reflective and reflective) in which perceivers may be. They may feel in a non-reflective consciousness (like mere individuals who look at the objects around them) or they may introduce a meta-level of reflection (corresponding to a reflective consciousness state) and thus also feel like an object themselves. In this case, although they still remain subjects who look at things around them, they also turn out to be the object of the eyes of others. In social psychology, these two states of consciousness have been studied mainly by self-awareness theory (SAT; Duval & Wicklund, 1972). According to SAT, objective self-awareness is induced by a variety of conditions—for example, looking into a mirror, seeing a photograph of oneself—that remind the people of their status as object. One of the main assumptions of this theory is that the awareness of discrepancy between the self and the system of standards of correctness produces a negative affect which motivates people to change their present state towards an agreement with the standard. The tenets of SAT have been confirmed for a variety of social and cognitive processes, including social facilitation (Carver & Scheier, 1981) and conformity (Diener & Srull, 1979; Kallgren, Reno, & Cialdini, 2000; Mullen, 1983; for a review, see Fejfar & Hoyle, 2000; Gibbons, 1990).

Moreover, an assumption of SAT closer to the classical theories of both Mead and Sartre refers to the involvement of self-consciousness for the identity. Sartre (1943) described how the presence of other people compels one to realize that he or she is an object for them. Thus, the presence of another person acts as a social mirror that ontologizes the subject, that is, it is a generative principle of his or her social identity. The identity is given by what I believe the other could see in me when I am aware that I am being watched. As self-reflective consciousness increases, it increases the awareness that the other (observing me) is the source of my identity, and one feels more haunted by the other's values over which—as Sartre states—you have little control. This idea also appeared in the initial formulation of Duval and Wicklund (1972) when they affirmed that 'since objective self-awareness is the only state in which awareness of discrepancy occurs, it follows that avoiding the stimuli which produce self-focused attention will reduce the negative affect contingent upon awareness of discrepancy' (p. 10). This process has been studied little, although possibly intervening in the studies of Greenberg and Musham (1981) and Twenge, Catanese, and Baumeister (2003), who showed that social rejection leads to self-awareness avoidance. The same process may also be considered as the one involved in the studies of O'Donnell, Jetten, and Ryan (2010) where they showed that surveillance is more acceptable when it originates from a group with which one identifies or shares an identity. This would prove that participants are quite aware—because of the implications for social identity—of whom they prefer to be the target of a gaze.

Thus, looking is a behaviour conveying one's own interest and attraction to the observed. However, there are images whose exploration will be well accepted in accordance with the normative standards, whereas there are others—for example, taboos—whose exploration may turn the observer into a deviant.

Self-consciousness determines image exploration as a visual behaviour from which the observer's characteristics can be inferred. In this sense, someone caught watching taboo images probably gives way to a negative impression. The negative social identity that the visual interaction can reflect could be prevented both by avoiding self-consciousness and avoiding looking at the stimulus.

THE PRESENT RESEARCH

Following the hypothesis that visual behaviour will be related to the social identity of the observed people, a novelty of our study is to manipulate the social category of membership of the individuals (i.e. the observed targets) presented in the photos shown to participants. In all three experiments, pairs of pictures—one with characters of social minorities and one with characters of social majorities—were shown to the participants. The minority and majority targets differed on various social dimensions: ethnic (gypsy vs. gadje, i.e. non-gypsy); sexual (heterosexual vs. homosexual couple); skin colour (White vs. Black); age (child vs. old person); race (intra-racial vs. inter-racial couple); animalization of the person (normal vs. dog-faced person). We assume that, as compared with majority characters, the minority characters are characterized by a greater degree of alienation, deviance, taboo, stigma and abnormality. The participants' perception of these photos in terms of minority versus majority was confirmed by a pilot study (see Method, Exp. 1).

The experimental manipulation consisted of creating two conditions of consciousness: reflective consciousness (consciousness to be seen) and non-reflective consciousness. In line with Sartre (1943), the first state is conceived as the perceivers' feeling of being an object themselves when they look at objects and people around them. This state may be induced by a spontaneous meta-level of reflection or by the mere presence of other people (i.e. seeing objects and people knowing that the others witness what one sees). The main hypothesis was that in the reflective consciousness condition, the participants will avoid looking at minority pictures and will prefer to keep their eyes on the majority pictures. Assuming that the look reifies and objectifies (e.g. Fredrickson & Roberts, 1997; Gay & Castano, 2010), the rationale is that in the reflective consciousness condition, participants will preferentially create a visual interaction with the majority rather than with the minority. That is, they will prefer to define their own social identity as ensured by 'getting' them to watch a majority character rather than as ensured by getting them to watch a minority character. On the contrary, in the non-reflective consciousness condition, the other will not be seen as a subject (and therefore the perceiver as an *object* for its gaze, in Sartre's terms), but it will be basically observed as an object. Having neutralized in this way reflective conscious social interaction, the perception will be guided more by the general attitude towards the stimulus than by the specific social identity it potentially involves. The prediction is that in this condition, participants will look more at minority than majority pictures because of the well-known relatively greater attention to the strange or negative stimuli (for an exhaustive review, see Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; see also Pratto & John, 1991).

In particular, in Experiment 1, the effect of the two states of consciousness (reflective vs. non-reflective) on the visual exploration of social and non-social stimuli was investigated. By the use of eye-tracking technology—which allows the researcher to have a precise scheme of each subjects' visual exploration—some participants were put in a reflective condition (i.e. knowing that the eye movements were monitored), others in a non-reflective condition (i.e. unknowing that the eye movements were monitored). How this condition and the minority versus majority categories of the social stimuli affected visual exploration was analyzed. Then, in Experiment 2, we asked the participants whether they preferred to look at the characters of the minority or at the characters of the majority and whether they preferred to be looked at by the characters of the majority or by the characters of the minority, in both a reflective (i.e. they gave their answers in public) and a non-reflective (i.e. they gave their answers in private) condition. Finally, in Experiment 3, we investigated whether visual interaction with the minority was felt as more distressing and aversive than visual interaction with the majority. That is, in a public condition—the experiment was performed in the presence of three other pupils—participants were tested on both direct and non-direct visual interactions with majority and minority characters.

EXPERIMENT 1

In the first experiment, to examine the effect of the two states of awareness on the visual exploration of the surrounding social reality, a series of image pairs in which a majority was opposed to a minority reality was shown to participants on a computer monitor. Eye-tracking technology was used to measure the gaze of participants on each of the two pictures shown on the screen. Participants were assigned to two conditions (reflective vs. non-reflective consciousness) with the hypothesis that in the reflective consciousness condition, they will look more to majority than minority pictures, whereas in the non-reflective consciousness condition, the opposite should occur.

Method

Participants

Twenty psychology undergraduate students at the University of Valencia (Spain) participated in the experiment (non-reflective consciousness condition: six women and four men; reflective consciousness condition: five women and five men).

Apparatus

Eye movements were measured with an SR Research EyeLink II system (SR Research Ltd., www.sr-research.com). The EyeLink II system consists of three miniature cameras mounted on a padded headband that have an average accuracy of less than 0.5°, a microsaccades resolution of 0.01° and a spatial resolution of 0.01°. Two eye cameras allow binocular eye tracking. An optical head-tracking camera integrated into the headband allows for the accurate tracking of the participant's point of gaze.

Procedure and Design

All the participants were tested in individual sessions in a quiet room. They were recruited to participate in an experiment on image perception and were introduced to the EyeLink helmet. Then, the experimental manipulation—consisting of two conditions of consciousness—was activated. In the reflective consciousness, the real function of the eye tracking was explained to participants—that is, eye tracking records all the eye movements on the screen with an extreme precision. In this case, participants were therefore aware that their eye movements were recorded and would be seen by the researcher. Instead, in the non-reflective consciousness, a fake function of the eye tracking was explained to them—that is, the eye tracking records the synchronicity/asynchronicity between the pupil and the retina, and the related variations due to the contrast and colour variations of the images. In this case, the participants did not know that their eye movements were recorded but they thought that the researcher was only interested in their reactions to contrast and colour. In the debriefing session, it was verified that none of the participants nurtured suspicions about the real goal of the experiment and—in the non-reflective consciousness condition—about the real function of the helmet.

Then, without adding any further information, the participants were seated in a chair in front of a 21-in. monitor (pixel resolution 1024 × 768) at a distance of ~70 cm and the experiment started, made up of 20 trials. A three-point horizontal calibration—which was required by the software for calibrating the helmet with the participant's gaze—was performed at the start of each test, and it was repeated if the error at any point was more than 1.0 degree or if the average error for all the points was greater than 0.5 degrees. Then, before each trial appeared, participants had to look at a cross in the middle of the monitor and the trial did not appear until the software recognized that the eyes were precisely directed towards the cross. This also allowed the calibration of the eye tracker each time, and the participants were obliged to start from the same fixation point.

Stimuli

All the participants saw the same set of photos. A total of 20 trials was used: 11 non-social stimuli and nine social stimuli. The stimuli presentation order was randomly varied each time. Non-social stimuli were one trial made up of a photo of a dog on the left of the screen and a photo of a horse on the right side of the screen (this trial was visible to the participants for a time of 20 000 milliseconds); five trials made up of two words (left and right sides) in capital letters (e.g. MARIO PERRO); five trials made up of two geometric figures or symbols (e.g. two triangles one with the vertex up and the other down). These last ten trials were visible to the participants for a time of 5000 milliseconds. Those non-social stimuli were introduced in order to check that the manipulation of reflective versus non-reflective consciousness effectively affected the visual exploration of social stimuli—and not of non-social stimuli—because of their induction of a reciprocal interaction.

The social stimuli—all visible to the participants for a time of 20 000 milliseconds—were subdivided according to six thematic social categories of opposition: (i) two trials in which majority reality corresponded to a heterosexual/intra-racial couple

kissing, whereas the minority reality was represented by a homosexual/inter-racial couple kissing. In particular, in a trial, a heterosexual young White couple kissing was opposed to an inter-racial young gay male couple kissing, whereas in the other, a heterosexual young White couple kissing was opposed to an inter-racial young homosexual female couple kissing; (ii) two trials intra-racial/majority (respectively a heterosexual White couple kissing and a heterosexual White couple holding hands) versus inter-racial/minority [respectively a heterosexual inter-racial (Black man/White woman) couple kissing and a heterosexual inter-racial (Black man/White woman) couple holding hands]; (iii) a trial opposing two suit wearing men, a White man (majority) and a Black man (minority); (iv) a trial opposing a gadge couple (majority) to a gypsy couple (minority); (v) a trial opposing a face of a child (majority) to a face of a very old man (minority); (vi) two trials concerning a species difference opposing White adult men (majority) to, respectively, a dog-faced person and a monkey-faced person. Minority images were four times the photo on the left of the screen and five times the photo on the right of the screen (this position was then counter-balanced across participants). Preliminary analyses revealed no reliable main effects or interactions as a function of the position in the screen presentation, so further analyses will be collapsed across this variable.

Pretesting of Experimental Stimuli

Twenty-three students (16 women, seven men) of the University of Valencia (Spain) were asked to form comparative opinions on all nine pairs of photos used in the main studies. For each pair, they had to mark 'which of the two photos will be judged by people in general as more... attractive, minority, deviant, abnormal, taboo, stigmatized, positive'. The results showed that in general, minority photos were considered to be less attractive (88%), more associated to minorities (91%), more deviant (87%), more abnormal (89%), more taboo (89%), more stigmatized (90%) and less positive (11%). Taking into consideration all the 63 (7 attributes × 9 pairs of photos) judgements made by each participant and by the use of the chi-square test, the minority photos in only six cases did not significantly differ from the majority ones. These exceptions are as follows: the old man was judged to be more of a taboo than the child in only 61% of cases; the heterosexual inter-racial (Black man/White woman) couple kissing was not significantly deemed to be less attractive (35%) than the homosexual inter-racial couple; and, as the most important exception, the Black man was considered similarly attractive (65%), deviant (61%), abnormal (65%) and positive (39%) as the White man. Nevertheless, the Black man was judged significantly more taboo (78%), more stigmatized (83%) and more minority (70%). Considering all the results, the images used as minorities are effectively characterized by a higher degree of strangeness, deviation, taboo, stigma and abnormality and are considered less attractive and less positive than their counterparts (majorities).

Dependent Variables and Data Analysis

Eye-tracking data were analyzed with the use of the EyeLink Data Viewer software, which allows identification of periods of static fixation between saccades with the use of a combined

eye velocity/displacement criterion. For each participant and each trial, the software allowed to assess where in the picture and for how long gaze was directed. Thus, for each fixation within a trial, we measured the fixation duration and position. For figures and words, we assessed whether fixation was directed to the picture/words on the left or to the picture/words on the right. For minority/majority trials and again for each fixation, this allowed us to assess whether fixation was directed to the minority or majority stimuli. Moreover, we measured whether the fixation was on the photo or completely outside the photo.

Results

Preliminary Analysis

As we have said before, images concerning minority *versus* majority characters were grouped into six thematic social categories of opposition. First, we analyzed the differences between these categories. Fixation number, mean of fixation time and position of the fixation—central versus peripheral—on each category were entered into a 2 experimental manipulation (non-reflective vs. reflective consciousness) \times 2 characters of the image (majority vs. minority) mixed-factors analysis of variance with the first variable as between-subjects factor. None of these analyses revealed significant effects. Thus, because all the categories showed almost the same eye movement patterns, the six thematic social categories of opposition were grouped into a single index. Cronbach's α for minority and majority images had a good fit: α majority fixation = .77; α minority fixation = .84; α time of majority fixation = .88; α time of minority fixation = .90.

Then, in two preliminary analyses, the fixation number and the fixation time were entered in a 2 sex (female vs. male) \times 2 experimental manipulation (non-reflective vs. reflective consciousness) \times 2 characters of the image (majority vs. minority) mixed-factors analysis of variance with the first two variables as between-subjects factors. Those analyses showed that the participants' gender did not have any main effect, nor any significant interaction effect with the other variables and thus it will not be taken into any further consideration.

Analyses on Social Stimuli

Fixations on the social stimuli (i.e. the total sum for the nine stimuli) were entered into a 2 experimental manipulation (non-reflective vs. reflective consciousness) \times 2 characters of the image (majority vs. minority) mixed-factors analysis of variance with the first variable as between-subjects factor. A significant interaction between the condition and the content of the image was found [$F(1, 18) = 17.95, p < .0001, \eta^2 = 0.50$]. Indeed, participants in the non-reflective consciousness condition looked more often at the minority ($M = 277, SD = 43.10$) than majority characters [$M = 234, SD = 32.78, t(9) = 3.57, p < .01$]. On the contrary, participants in the reflective consciousness condition looked more often at the majority ($M = 280, SD = 52.52$) than minority characters [$M = 246, SD = 32.67, t(9) = 2.50, p < .05$].

Using the same analysis with fixations duration (i.e. the milliseconds of each fixation) on the social photos as dependent

variable, we found an interaction effect [$F(1, 18) = 9.95, p < .01, \eta^2 = 0.36$]. In the non-reflective consciousness condition, the mean of duration of fixations was higher in the minority photos ($M = 313.59$ milliseconds, $SD = 57.17$) than in the majority photos [$M = 296.73$ milliseconds, $SD = 44.10, t(9) = 2.50, p < .05$]. Instead, in the reflective consciousness condition, the mean of duration of fixations was higher in the majority characters ($M = 313.77$ milliseconds, $SD = 44.90$) than in the minority characters [$M = 287.98$ milliseconds, $SD = 41.32, t(9) = 3.19, p < .05$].

Then, the same analysis was also performed on the total time spent watching every photo—that is, the sum of all the fixations duration within each photo. An interaction effect was found, $F(1, 18) = 40.65, p < .0001, \eta^2 = 0.69$. In the non-reflective consciousness condition (Figure 1), the time spent watching every photo was higher in the minority photos ($M = 9448.76$ milliseconds, $SD = 785.67$) than in the majority photos [$M = 7615.42$ milliseconds, $SD = 906.63, t(9) = 4.24, p < .01$]. Instead, in the reflective consciousness condition, the time spent watching every photo was higher in the majority characters ($M = 9544.67$ milliseconds, $SD = 581.38$) than in the minority characters [$M = 7761.47$ milliseconds, $SD = 649.97, t(9) = 4.85, p < .001$].

Analyses on Non-Social Stimuli

Fixations data on words stimuli and figures were entered into a 2 experimental manipulation (non-reflective vs. reflective consciousness) \times 2 (left placed vs. right placed on the screen) mixed-factors analysis of variance with the first variable as between-subjects factor. The only almost significant effect found on these stimuli was that words and geometrical figures placed on the left part of the screen received a higher number of fixation ($M = 64.4, SD = 11.69$) than those placed on the right part of the screen ($M = 57.5, SD = 13.24$), $F(1, 18) = 3.59, p = .08, \eta^2 = 0.17$. Instead, the experimental condition (non-reflective vs. reflective

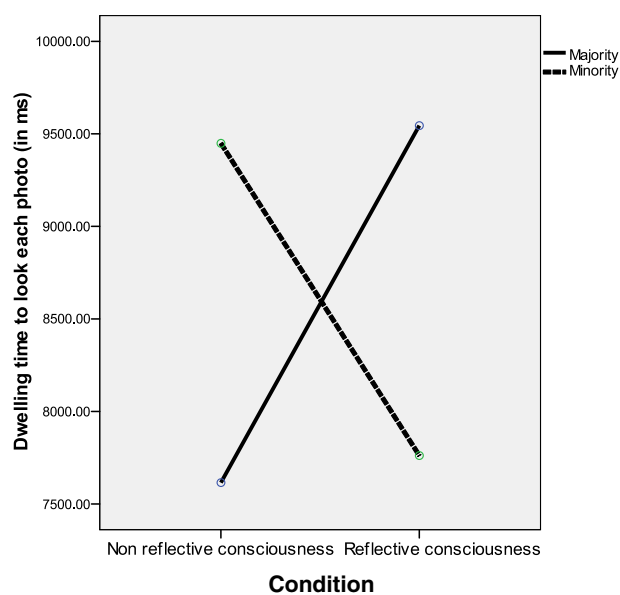


Figure 1. Mean of the total time (number of fixations \times fixation duration) spent looking on the majority and minority photos in the non-reflective and reflective consciousness conditions (Experiment 1)

consciousness) was not significant in any of these stimuli ($F < 1$). Alike, the dog versus horse photo did not produce any effects ($F < 1$).

The same analysis, with the use of fixations duration on non-social stimuli as dependent variable, revealed that the stimuli placed at the left side of the screen ($M = 280.23$ milliseconds, $SD = 43.91$) were looked less than the ones placed on the right side of the screen ($M = 308.96$, $SD = 59.24$), $F(1, 18) = 5.38$, $p < .05$, $\eta^2 = 0.23$. However, the experimental condition (non-reflective vs. reflective consciousness) was not significant in any of these stimuli ($F < 1$). Alike, the dog versus horse photo did not produce any effects ($F < 1$).

Ancillary Analysis

A chi-square test—concerning which character (the minority vs. the majority) most attracted the very first fixation—showed that in four pairs of photos, it was the minority character who attracted the first fixation of most participants, but for the other five pairs of photos, it was the majority character. Moreover, in both non-reflective and reflective consciousness, participants set their first look upon the same photo. The following four minority characters attracted the first fixation rather than the corresponding majority character: the heterosexual inter-racial (Black man/White woman) couple kissing, the monkey-faced person, the gypsy couple and the dog-faced person.

Then, in order to check if the set of photos that attracted the very first fixation had a substantive effect, the number of fixations and the fixation duration were entered into a 2 experimental manipulation (non-reflective vs. reflective consciousness) \times 2 characters of the photo (majority vs. minority) \times 2 (images first looked vs. images non-first looked) mixed-factors analysis of variance with the first variable as the between-subject factor. This last variable did not produce any interaction with the other two variables. The only significant effect [$F(1, 18) = 13.28$, $p < .01$, $\eta^2 = 0.43$] concerning the first look was that the photos that attracted the first fixation ended up attracting more fixations altogether. However, it is important to consider that this kind of salience effect did not interact with the minority and the majority characters, nor with the experimental manipulation (i.e. non-reflective vs. reflective consciousness).

In regard to non-social stimuli, chi-square test showed that most of participants significantly started to look first to the left and then to the right image ($p < .01$), seemingly using the same strategy of reading from left to right. The only exception was in the trial corresponding to the numbers '1' and '2' where half of the participants launched the first fixation on the 1 and the other half on the 2.

The number and the total duration of fixations completely out of the pictures were also coded. The analysis did not show any significant effect between conditions. As concerns the number of fixations, a *t*-test showed that the only significant effect was that the stimulus of words or geometric figures gave rise to a greater number of 'escapes' ($M = 27.9$) than the images that represent people [$M = 10.6$, $t(19) = 7.61$, $p < .001$]. But, this is understandable because the area of words and geometric figures was smaller than the area of social stimuli. As concerns the average duration of fixations outside the images, an ANOVA did not reveal differences between the two experimental

conditions between total time out on non-social stimuli ($M = 249.77$) versus on social stimuli ($M = 234.13$, $F < 1$).

Discussion

A wide variety of studies comparing the degree of attention given to positive versus negative information (see Baumeister et al., 2001 for an exhaustive review) has led us to predict that the images of social minorities—characterized by a higher degree of strangeness deviation, taboo, stigma and abnormality— attract more attention than their counterparts of social majorities, in that condition in which participants do not know that what they observe is at the same time being recorded. The results confirm the hypothesis that in the non-reflective consciousness condition—in which participants were told that the purpose of the eye tracker was to measure variations in the size of the retina in terms of colour—images of minorities receive more attention (more frequent and longer fixations) than those of majorities. On the contrary, in the reflective consciousness condition—in which participants were informed that the eye tracking allowed us to measure where they watched—they pay more attention to the images of the majorities than those of minorities. In contrast, on socially neutral images—that is, geometric figures and words—the experimental manipulation (non-reflective vs. reflective consciousness) does not influence the visual behaviour pattern. Thus, when participants are only aware of the synchronicity/asynchronicity function of the eye-tracker—and thus their reflective consciousness is not induced—they do not see themselves through the social mirror of the minority. On the contrary, when a reflective consciousness is induced, participants seem to avoid the self-consciousness that may derive from the minority characters through a strategy of eluding visual interaction with them.

Some of the limitations concerning this study led us to the second experiment. First, an alternative explanation of the results may be provided referring to conforming with desirable social norms. Indeed, it can be argued that participants avoid looking at minorities when they believe that their gaze behaviour is monitored by the experimenter because they simply follow those social norms that proscribe staring at minorities. In this sense, when they believe that the experimenter will not know where they are looking at, they do not abide by these social norms. Second, the reported experiment lacks a more direct investigation of the assumption that people avoid looking at the minorities in order not to create a social interaction with them. That is, this experiment does not solve the issue as to whether avoidance behaviour in the reflective consciousness condition is driven by the motivation not to look at the minority or not to be the object of the minority's gaze. Indeed, following Sartre's (1943) theory, social interaction with characters of the photo should be induced by the feelings of being—while looking—at the object of their gaze. These questions are addressed in the following experiment.

EXPERIMENT 2

The results of the previous experiment showed that under the condition that induces reflective consciousness, participants

preferred to look at the majority rather than at the minority. The interpretation of these results was that people avoid looking at the minorities to prevent a virtual social interaction with them. However, whether in the reflective consciousness condition, the avoidance of minority pictures is driven by the motivation not to look at the characters of the minority or not to be the object of their gaze was unexplored. Thus, in this second experiment, we investigated what exactly observers avoid: looking at the minority or being looked at by it. In particular, half of the participants were explicitly asked whether they prefer to look at the characters of the minority or at the characters of the majority, whereas the other half were asked whether they prefer to be looked at by the characters of the majority or by the characters of the minority. In addition, participants had to give their answers in a private or in a public (i.e. being observed by three of their colleagues) condition, the latter being designed to increase reflective consciousness.

The main hypothesis of this experiment is that in the condition of reflective consciousness—that is, feeling watched or monitored by the others—between choosing to be looked at by minority or majority characters participants will choose to be looked at (i.e. objectified) by the majority, avoiding virtual social interaction with the minority. Instead, as regards who they prefer to look at, no difference is expected between private and public conditions.

Method

Participants

A total of 89 (66 women and 23 men) undergraduate psychology students at the University of Valencia (Spain) participated in the experiment.

Procedure and Design

Each participant received a nine-page booklet with the same pictures (the social stimuli) used in the previous experiment. Each page contained two pictures: one depicting the minority character and one the majority character. The same randomized order of presentation as the previous experiment was maintained. The experiment was a 2 (whom I prefer to look at vs. whom I prefer to be looked at by) \times 2 (public vs. private situation) factorial design. Concerning the first independent variable, in the condition 'whom I prefer to look at' below the two photos, the following statement appeared: 'Suppose that there is a total of 25 seconds to display both these photos (one after the other) on a computer screen. Of those 25 seconds, how many seconds do you want picture A to stay shown on the screen—i.e. how many seconds you would spend watching picture A? And, in turn, how many seconds do you want picture B to stay shown on the screen—i.e. how many seconds you would spend watching picture B? The sum total must be 25 seconds'. Instead, in the condition 'whom I prefer to be looked at by', the following statement was written: 'If instead of being you the viewer you were the one being actually observed (i.e. the object of observation), what characters would you prefer to be looked at by: the one in picture A or B?'

Concerning the second independent variable, in the private condition, participants answered anonymously and in isolation

from everyone else. In this case, a non-reflective consciousness state was supposed to be stimulated. Instead, in the public condition, while the participant answered the booklet, three other students from the same classroom (chosen randomly by the experimenter) were assigned the task of observing the answers given by the participant without making any comments or providing any reaction. This public condition was supposed to activate a reflective consciousness state.

Dependent Variables

In the condition 'whom I prefer to look at', the seconds that the people declared they would see the photo of the majority versus the photo of the minority were coded as a categorical variable, counting the number of photos in which there is a longer exposure (13 or more seconds, as the total had to be 25 seconds). In the 'whom I prefer to be looked at by' condition, the dependent variable was the number of photos (maximum 9) in which participants stated to prefer to be observed by the majority versus minority characters.

Results

In general, participants preferred to watch or to be watched by the majority characters: 62% choices for the majority versus 38% choices for the minority. Thus, in general, there was a preference for maintaining visual interaction in either direction (to watch or to be watched) with the majority characters.

As it was a dichotomous choice (minority vs. majority), only the number of choices in favour of the picture of the minority were analyzed. An ANOVA 2 (whom I prefer to look at vs. whom I prefer to be looked at by) \times 2 (public vs. private situation) on the number of times participants chose the minority characters showed that participants preferred to watch the minority ($M=42\%$) rather than to be watched by the minority ($M=35\%$), $F(1, 85)=3.89$, $p < .05$, $\eta^2=0.04$. In addition, the interaction between the two independent variables was significant, $F(1, 85)=4.76$, $p < .05$, $\eta^2=0.05$. Similar effects were observed when the proportion scores were arcsine-transformed. As can be seen in Figure 2 and as hypothesized, although there was no significant difference between private ($M=39\%$) and public ($M=45\%$) conditions on 'whom I prefer to look at' dependent variable [$t(43)=1.11$, $p=ns$], participants chose to be looked at by the minority's characters more in the private condition ($M=40\%$) than in the public condition [$M=29\%$, $t(42)=1.97$, $p < .05$].

Discussion

In this experiment, the comparison of the two types of visual interaction with people belonging to social majorities and minorities was made explicit. Compared with the non-reflective consciousness condition (private situation), results confirm that in the reflective consciousness condition (public situation, when the answers are viewed by peers), participants are concerned about being the object of the minority's gaze. These results are interpreted as confirming that the induction of a reflective consciousness leads participants to avoid being ontologized by the look of the minority in a larger way.

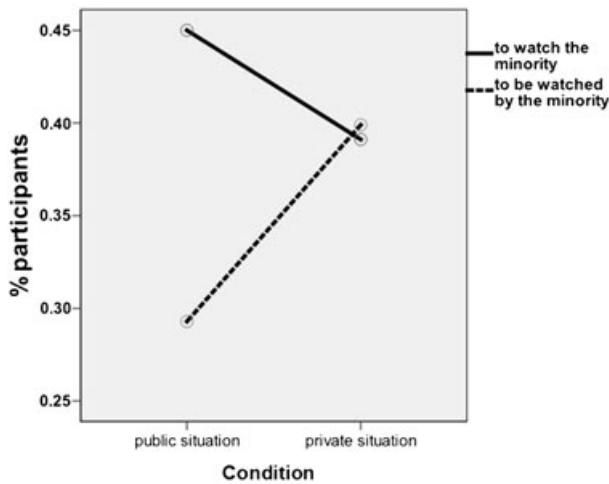


Figure 2. Percentage of participants that declared to prefer to watch or to be watched by the minority in the public and private conditions (Experiment 2)

Thus, in the first experiment, the measurement of the visual exploration of the photos brought people to avoid looking at minority characters when they were in a state of reflective consciousness. This experiment shows that the reflective consciousness state leads participants to avoid being the object of their gaze, whereas it has no significant effect in the preference to look at them. Therefore, people choose to look at the minority characters but not to be looked at by them (expressing a likely discomfort in a social interaction with them).

A limit of this experiment is the choice to adopt different tasks (seconds spent looking at vs. dichotomic choice between being looked by either A or B) for the dependent variables in the two different conditions, increasing the potential influence of a different response measure effect. Thus, future studies should replicate these data using the same response measure for the two conditions.

EXPERIMENT 3

Previous studies have shown that people avoid looking at minorities (Experiment 1) in order not to be looked at (Experiment 2). In this third experiment, we tested whether this occurs because the minority's gaze—directed at them—is experienced as distressing and aversive. In line with other studies (see Twenge et al., 2003), time estimation with the characters of the photos is used as a proxy for distress. Following results observed in the study of Twenge et al. (2003), we expected that direct visual interactions with the characters of minorities are felt to be longer than those with the majorities. That is, because the visual interaction with the minority will be felt as more distressing and aversive, the time of this interaction will be overestimated in regard to the visual interaction with the majority or in regard to a condition in which participants will not hold any direct interaction with the minority.

Participants

A total of 56 (43 women and 13 men) psychology undergraduate students at the University of Valencia (Spain) participated in the experiment.

Procedure and Design

The experiment was presented as subjective estimations of time. It was a three-within independent variables design: 2 characters of the photograph (minority vs. majority) × 2 length of exposure time of the photo (7 vs. 13 seconds) × 2 modality to see the photo (facing the photo vs. turning one's back to the photo). The same sequence of photos of the previous studies—with the same counterbalanced order—was projected to the participants on a large screen. The only difference was that in this experiment, only one photo at a time was presented and not pairs of photos. However, majority and minority photos linked in the previous studies were always presented one after the other, that is, after the photo with the minority character, there was always the picture with the corresponding majority character (or vice versa).

The total number of photos was 18 (nine with minority characters and nine with majority characters). In some trials, the picture was presented for seven seconds and in others for 13 seconds. The times of exposure were counterbalanced, so that those photos presented to half of participants for seven seconds were presented for 13 seconds to the other half. The photo of the minority and corresponding majority characters were always presented with the same exposure time (both for 7 or 13 seconds). As a training for the procedure, all the participants began seeing a picture of a horse and then another of a dog (or vice versa) displayed the first for 7 second and the second for 13 seconds (or vice versa). These photos were not counted in the indices to be analyzed, because their function was only to train the participants to estimate the different exposure times before the target photos. Before starting the experiment, the participants were informed that the exposure time of each picture might change, but that it was always less than 30 seconds. Their task was to estimate the time during which the photo was displayed on the screen.

All the participants performed two time estimation tasks both in a public condition—that is, in the presence of three classmates who had the role of observers as in Experiment 2. As the estimations were all made in public, participants were always put in a state of reflective consciousness. The first estimation was made seeing the photo on the screen: The participants stood in front of the screen throughout the time the photo was being shown, and then they had to estimate for how many seconds the picture had been shown. As the participants had a direct visual interaction with the majority or the minority character, this condition was supposed to activate a stressful experience only in the case of minority. The second estimation was made in a blind way: The photo was displayed to the participants for two seconds; then they had to turn their backs to the screen and an auditory start and end signal marked the interval time that the photo was being displayed on the screen. Again, their task was to estimate how many seconds the picture was shown on the screen while they could not see it. Because in this case the participants do not have a direct visual interaction with the majority or minority character, no different distress between minority and majority was supposed to be experienced by participants.

Results

An ANOVA 2 character on the photo (majority vs. minority) × 2 length of exposure time of the photo (7 vs. 13 seconds) × 2

modality of seeing the photos (facing the photo vs. turning one's back to the photo)—with repeated measures of the three factors, and the estimate of the time of exposure as the dependent variable, indicated that photos of the minority characters were believed to be exposed for a longer time than the pictures of the majority characters, $F(1, 55) = 39.74$, $p < .0001$, $\eta^2 = 0.42$. However, the most interesting result was the interaction between the minority versus majority characters and the modality of seeing the photos, $F(1, 55) = 56.46$, $p < .0001$, $\eta^2 = 0.51$. As shown in Figure 3, in the 'turning one's back to the photo' modality, no significant difference between the estimated time for the photos of majority and minority characters appeared. Instead, in the direct visual interaction modality ('facing the photo'), the time of exposure of minority characters was overestimated and the time of exposure of majority characters was underestimated. These effects were independent of whether the picture was presented for 7 or 13 seconds ($p > .20$). The only effect induced by the exposure time was an interaction of that variable with the modality of viewing the photos, $F(1, 55) = 20.26$, $p < .0001$, $\eta^2 = 0.27$: When the picture was presented for seven seconds, in the 'facing the photo' condition, the participants believed it was showed longer than in the 'turning one's back to the photo' condition. Instead, when the picture was presented for 13 seconds, when they watched it, they underestimated the length of exposure as compared with when they had their backs turned to it. Nevertheless, this interaction was considered irrelevant to the theoretical question we were investigating.

Discussion

The results of this third experiment show that direct visual interaction (i.e. face to face) with minority characters is experienced as a longer psychological experience than the interaction with the majority characters. However, as long as participants are not in a visual direct interaction, but turning their backs to the screen, the majority or minority status of the characters in the picture does not affect the subjective estimation of exposure time. We can argue that whereas direct visual interaction with

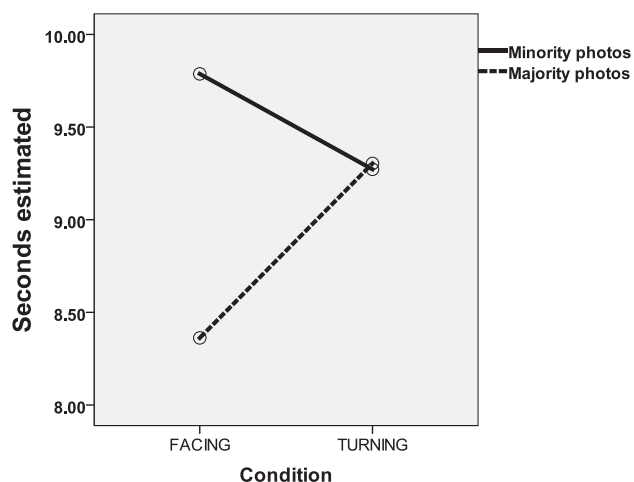


Figure 3. Estimate of the time of exposure of the majority and minority photos in the 'facing the photo' or in the 'turning one's back to the photo' condition (Experiment 3). Notes. FACING = Facing the photo. TURNING = Turning one's back to the photo

the majority character is perceived as being pleasant—so that participants perceive this interaction as short—direct visual interaction with minority characters is perceived as longer and perhaps more identity demanding, that is, they feel conceptualized by the mirror of the minority's undesirable values (Sartre, 1943). Thus, in a state of reflective consciousness (determined by the public condition of the experiment), the reciprocal gaze with minorities (vs. majorities) is perceived as stressful whereas no distress is experienced when the reciprocal gaze is interrupted ('turning one's back to the photo' modality). In this sense, as other studies have shown (see Twenge et al., 2003), we can argue that the negative identity that arises from the visual interaction with the minority may be reduced by avoiding looking at devalued social stimuli—in this case the minority pictures—and by consequently reducing one's own state of self-reflective consciousness.

A limit of this experiment is that a private condition was not studied. That is, the experiment was conducted only in a public condition. Future studies should replicate these results by considering a private condition, too. Notwithstanding, we think that the results clearly confirm the ones of the other two experiments. That is, in a reflective consciousness condition and in a social visual interaction, participants are more comfortable looking at the majority than looking at the minority.

GENERAL DISCUSSION

The three studies presented are based on the hypothesis that while watching others, the observer can feel observed, by them or by a third person. A particularity of these studies is to assume that such consciousness of being simultaneously under observation can be induced even if observed people are mere photographs. A large number of studies—inspired by the SAT of Duval and Wicklund (1972)—focussed on how increasing self-awareness enhances conformity with the standards of correctness (the norm of the situation). Contrariwise, the objective of our study was to test the hypothesis that when people are aware of being in turn the object of observation, they try to avoid visual interaction with people belonging to social minorities. The rationale for this hypothesis—in Sartre's (1943) terms—is that the presence of other people compels one to feel that one is an object for them. As this reflective consciousness increases, the awareness that others (i.e. those observing me) are the source of my identity will increase as well. Thus, the (visual) interaction with others ontologizes the person—that is, the other acts as social mirror, and in this sense, the visual interaction may constitute a generative principle of social identity. Given this process, and motivated by fostering a positive social identity, the person seeks to avoid direct visual interaction with socially undervalued people, opting for visual interaction with someone who is better socially valued.

In the first experiment, in the condition in which participants feel they are observed (i.e. they are aware that their eye movements are recorded), they avoid maintaining the visual interaction with minority characters, which were characterized by a greater degree of alienation, deviance, taboo, stigma, abnormality or less attractiveness, and less social value. In contrast, when the participants are led to believe that it is a colour perception

task, photos that usually are more socially devalued (those concerning minorities) attract the visual attention more than the socially valued photos (majorities). In this condition, the social definition of the photograph characters goes to the background, and photos are valued more on the basis of their visual characteristics than as social mirrors or pillars of social identity. Therefore, in line with the literature which showed that people pay more attention to negative than positive information (see Baumeister et al., 2001), participants give much more visual attention to the more negative 'stimuli' (i.e. those stranger and odder) when they are detached from social identity concerns.

Experiment 2 has been particularly revealing for reflective consciousness of the importance of choosing whom you look at and whom looks at you. In particular, the choice between majority and minority characters was made explicit. Nowadays, a social desirability standard prescribes to avoid public discrimination of social minorities, for example, explicitly denying their social visibility. In effect, when participants are under observation by their peers, they are more in accordance with this rule, giving almost equal visual presence to the minority than the majority. This result is in line with the prediction of the SAT, that is, increasing reflective consciousness (e.g. being under observation) increases conformity with salient norms. However, the most original result of this experiment is detected in the other component of the reciprocal visual interaction: In reflective consciousness condition, participants significantly avoid having minority characters watching them. In terms of Sartre (1943), they tend to avoid being ontologized by the gazes of the minority.

Finally, in the third experiment, we tested whether visual interaction face to face with the photo of the minority characters is perceived longer than visual interaction with the majority characters. To the extent that in the 'turning one's back to the photo' condition there are no differences in the time estimates that the photos of the majority and the minority remain exposed, the relevant psychological difference is in the 'facing the photo' condition, that is, this condition supposed to enhance the state of self-reflective consciousness. As hypothesized, in this condition, direct visual interactions with the characters of minorities are felt to be longer than those with the majorities. Participants probably perceive a more identity-demanding situation in direct interaction with social minorities. However, future studies should address this issue more thoroughly.

In conclusion, it is widely accepted that reflective consciousness serves as an increasing conformity mechanism with regulatory standards. It functions as a sort of a self-generated conformism. Our experiments add that participants avoid visual interaction with people belonging to social minorities, presumably in order to prevent them from seeing themselves through the eyes with which the minority would see them. In previous research on social influence, notions of conflict identification and identity conflict—conceived as issues that prevent minority influence—were developed (Mugny & Pérez, 1991; Pérez & Mugny, 1993). In the experiments reported here, we have shown how social interaction with the minority is disrupted as this minority becomes a source of reflective consciousness. In future studies, the interaction between reflective consciousness induced by a minority and its influence warrants analysis.

As regards possible future research, on the methodological level, it may be also interesting to consider other manipulations

of gaze phenomenology and in particular the objectification that may imply being the object of a gaze according to the social identity of both the perceiver and the perceived. Despite these and other limitations, we believe that the relationship between self-awareness and (in)visibility of social minorities is a fruitful path of inquiry for investigating the phenomena of social influence and social identity.

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