I See Me, You See Me

I See Me, You See Me: Inferring Cognitive and Emotional Processes from Gazing Behaviour

Edited by

Pedro Santos Pinto Gamito and Pedro Joel Rosa

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This book is for my sweet daughters, Maria and Matilde, and to a glorious future ahead. And to my dear wife, Fátima, as always.

Pedro Gamito

I dedicate this book to my family for the unconditional support and to Petra, my Partner, for being a constant source of motivation.

Pedro J. Rosa

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And, of course, a vigorous applause must go out to the authors and the reviewers. This book, is, ultimately, yours.

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CHAPTER ONE

VOTING ON A FACE: THE IMPORTANCE OF APPEARANCE-BASED TRAIT INFERENCES IN A POLITICAL CANDIDATE EVALUATION: AN EYE TRACKING APPROACH

DIOGO MORAIS[†1,2,3], PEDRO J. ROSA[1,2,4,5,6], RODRIGO BRITO[1,2], INÊS MARTINS[1], FILIPA BARATA[1], JORGE OLIVEIRA[1,2], PEDRO GAMITO[1,2], FÁBIO SOARES[1] AND CATARINA SOTTO MAYOR[1]

Abstract

A large amount of studies have addressed the role of politicians' appearance in the outcome of political elections in Western democracies. More recently, the focus of most of these studies has been on facial appearance-based trait inferences people make when considering electoral choice between candidates. This chapter describes a pilot study exploring

[†] diogo.morais@ulusofona.pt.
[1] School of Psychology and Life Sciences, Lusophone University of Humanities and Technologies (ULHT), Lisbon, Portugal.
[2] COPELABS – Cognition and People-centric Computing Laboratories (ULHT).
[3] CICANT – Centre for Research in Applied Communication, Culture, and New Technologies (ULHT).
[4] Instituto Universitário de Lisboa (ISCTE-IUL), Cis-IUL Portugal.
[5] Centro de Investigação em Psicologia do ISMAT, Portimão, Portugal.
[6] GIINCO – Grupo Internacional de Investigación Neuro-Conductual, Barranquilla, Colombia.

the use of eye tracking data to understand the effects of appearance on preference for faces presented as those of candidates. Results show that both darker-skinned faces are judged as both more attractive and, in the case of males, as more threatening, and that they are chosen more often as preferred political candidates. ET data shows that these faces are also fixated faster than lighter-skinned faces, indicating heightened attention to faces with, in effect, more salient positive and negative stimuli. Limitations of the study point to the need for an expanded use of eye-tracking with crossover designs.

Introduction

Despite the widespread dissemination of eye-tracking (ET) techniques in the social and psychological sciences, as well as in market research and human resources management, there are a number of scientific disciplines in which the use of ET has barely penetrated. One of these is political psychology, which mostly studies psychological processes involved in the relation between mass publics and democratic politics. In the Western world, the importance of democratic politics is paramount, since it impacts every aspect of people's lives. There are, however, some specific moments when people are requested to intervene directly in the democratic process by electing their representantives. In elections, people's choices are usually based on a mix of political party sympathies, policy preferences, and available individual candidates. One of the factors that influence how people choose among candidates is a heuristic process of inference of candidates' personality traits from their facial appearance (Lawson, et al. 2010; Little, et al. 2007; Berggren, Jordahl and Poutvaara 2010; Olivola and Todorov 2010). Indeed, people easily and consistently infer personality traits from facial features (Todorov, Said, Engell, & Oosterhof 2008). However, facial features are also used to infer social category membership (e.g. gender, age, race), thereby activating category stereotypes, which are mostly based on personality traits, and thus influencing electoral choice. Race and gender in particular are prone to perceptual biases favouring higher-status or dominant groups (e.g. Whites, males) over lower-status or subordinate groups (e.g. Blacks, females) (Jost, 2001; Jost, Pelham & Carvallo, 2002). In this chapter we report a pilot study testing the effect of skin tone and gender on inference of personality traits and its consequences on electoral choice, while exploring the usefulness of ET data for this purpose.

Candidates' appearance and voting choice

In common sense discourse, politicians' appearance is often believed to have an effect on their electoral success. Likewise, candidates' appearance has been a central concern for political campaign organizers for a long time (Schlesinger, 1994). Campaigners view candidates as a marketable asset, just like any product, service, or brand, and they do whatever it takes to make the "package" as attractive as possible for the consumer (i.e. voter). Thus, a good deal of work goes into making candidates more attractive, to the point of photoshopping pictures of candidates for campaign purposes. On the other hand, as Lawson and colleagues (2010) note, political scientists remain sceptical on the impact of candidates' appearance on their electoral success, preferring to believe that electoral success depends almost exclusively on voting systems, ideological and political party identification, and the performance, real or perceived, of incumbents in key policy areas (Merrill and Grofman, 1999; Miller and Shanks, 1999). So, is this effect of appearance on voter choice simply a preconception, or does it correspond to reality?

In fact, a growing body of research offers empirical support to the idea that politicians, just like people in other professions, are judged heuristically by their non-verbal behaviour, by their image in general, and by their facial features in particular, and that these have an impact on voters' choices (Mattes et al. 2010). Thus, unlike what one might like to believe, voters are not purely rational thinkers, let alone decision makers, and we can trust them to make decisions based on heuristics (Quattrone & Tversky 1988). The past ten to fifteen years have witnessed a surge of research in political psychology on this subject (Little et al. 2007; Ballew & Todorov 2007; Castelli, et al. 2009) but seminal research going back to the 1980's (e.g. Sigelman, Sigelman, & Fowler 1987) shows that physically attractive candidates have better results than those who are not (Sigelman, et al. 1986; Sigelman, Sigelman & Fowler 1987). More recent research found that participants' inferences of competence of candidates based on their facial appearance (i.e. participants had no prior knowledge of the candidates) predicted those candidates' actual electoral success, whereas inferences related to both trust and likeability did not (Todorov et al., 2005).

Race, gender, and voting choice

Gender and race may play a role in voting choice in several different ways. People are usually biased to favour members of their own group (i.e.

ingroup bias; Brewer, 2007; Tajfel and Turner, 1986), because of identity concerns or trust. But they may also be biased to prefer members of dominant or higher-status groups (e.g. males, Whites), irrespective of whether they are ingroup or outgroup members, because these are considered to be more experienced and competent in wielding power (Jost, 2001; Jost, Pelham & Carvallo, 2002). In both cases, stereotypes of the groups concerned play a role. Voters may use non-party social category stereotypes to decide if candidates are honest, trustworthy, competent, or share the same political ideology and policy preferences as the voter; in the US, women are often viewed as more honest than men, and Blacks as more liberal (i.e. favouring social welfare policies) than Whites (McDermott, 1998).

In Portugal, subtle (but not blatant) prejudice against Blacks is relatively widespread (Vala et al. 1999); and the operation of unconscious perceptual biases and stereotyping. In particular, Whites tend to spend less time processing Black faces in order to infer traits than they do processing White faces (intergroup time bias), and individual differences in this time bias correlate with implicit measures of prejudice (Vala et al. 2012), which indicates that people spending less time processing a target will tend to use negative stereotypes more easily. Finally, recent research shows that Whites use facial features and skin tone independently to infer how much Black stereotypes apply to a member of that category, influencing their affective reactions (Hagiwara, Kashy, and Cesario, 2012). Interestingly, because afrocentric features are also present in Whites, differences in afrocentric features in Whites also influence judgements, with negative practical effects (i.e. sentencing, Blair, Judd, and Chapleau, 2004). What is not known, however, is whether skin tone also influences judgements independently of categorization.

Can eye tracking tell the tale?

Humans show a consistent pattern of eye movements which can best be described as ‘saccade and fixate’ strategy (Land 1999). When we look at a scene or search for a specific area in a visual field, our eyes usually move every 250–350ms. These movements serve to move the fovea centralis to the part of visual field that is going to be processed in high resolution (Rayner & Castelhano 2007). This process is at the basis of selectivity of attention first noted by William James (1890), and well-exemplified in his Latin phrase ‘Pluribus intentus, minor est ad singular sensus’, which expressed the fact that the human sensory system is limited and unable to attend to many things at the same time. Considering this process, choosing

a candidate is perhaps not that different from the process of choosing a product on a shelf, in which we are overwhelmed with information and have to select and pay attention to that which seems most relevant. The inspection of the visual field is performed minutatim, but not in its entirety. Attention is the selective process by which the minutiae are chosen. It coordinates the perception-action cycle and preserves goals over time, despite its limited capacity. This imperious information selection characterizes the visual selective attention.

In any visual stimuli (e.g. an image of a candidate) attention can be deployed in one of two ways: endogenously or exogenously (Posner, 1980). In endogenous attention, attention is assumed to be under the overt control of the subject, (e.g., "I am searching for a serious politician, and I will attend to a face that expresses this quality"). This is also known as "top-down" or goal-driven attention (Yantis 1998). Endogenous attention is voluntary but has a slow time course. In contrast, attention can also be reflexive or exogenous when it is driven by an external stimulus that automatically captures attention to a specific visual area. This has been defined as "bottom-up" or stimulus-driven attention. For instance, the face of a Black candidate among face of White candidates will capture attention exogenously due to a contrast effect. Exogenous attention attracts attention in an automatic fashion and has a faster time course than endogenous attention (Cheal & Lyon 1991).

When a specific visual area or object in a scene is selected by attention, it will be processed at high resolution, and other visual areas or elements in the visual field are concurrently suppressed. In other words, when a visual area captures the interest, the gaze moves to fixate it. This attentional process is achieved through both bottom-up and top-down mechanisms. The former process is related to the visual elements (e.g. contrast, luminance); the latter is initiated from higher cortical centres and driven by affective states, goals, memory or context (Rayner & Castelhano 2007). The combination of these mechanisms, along with other cognitive faculties, is at the basis of selective visual attention.

Study Overview

The aims of this study were to explore the role of race and gender cues in facial appearance-based inferences of personality traits of targets presented as potential candidates, the effect of these inferences on voting preferences for those faces, and the role of eye-tracking data in understanding the relation between these effects. We decided not to use actual Portuguese candidates' faces because a) the number of Black

candidates in Portuguese politics is scarce and b) candidates are often associated to a specific political history / party. We also chose not to use faces of US politicians because a pre-test showed that participants thought they did not look like Portuguese politicians.

Finally, we chose not to use White vs Black faces, because the latter vary greatly in both skin tone and afrocentric features, thereby confounding the independent effects of both of these dimensions (Hagiwara et al. 2012). Instead, we manipulated the skin tone of male and female White computer-generated faces from existing databases, creating matched dark-skinned versions.

We were interested in knowing what would be the effects of gender (male vs female) and skin tone (dark vs light) on trait inferences and voting choices, as well as the effects of the traits on the choices. We were also interested in knowing the difference in attention elicited by these cues in targets, as measured by speed of fixation.

Method

Participants

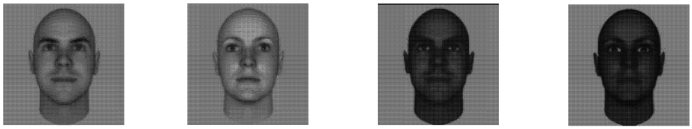
30 Portuguese undergraduate students (16 males; 25 Whites and 5 Blacks; Mean age 21yrs ± 2) at Lusophone University were recruited by research assistants on campus. They were asked to participate solely to help advance scientific knowledge, and they participated voluntarily, receiving neither credits nor other external incentives. Potential participants with prior experience in Eye Tracking experiments or having previously worked with any of our research team members were immediately screened out. Also, only participants with normal or corrected-to-normal visual acuity were included. 62% of participants reported having voted in the last general elections, but 86.7% of participants did not view themselves as represented in those elections.

Procedure and stimuli

Participants were told that they would be participating in an experiment to evaluate political candidates. Each participant was seated individually in a soundproof room 60cm from an Eye-Tracking screen and asked to keep their eyes focused on the screen. The experimenter explained that they would carry out two tasks. In Task 1, they would have to rate 80 images of faces each on four personality traits.

Before the actual task itself, participants carried out a training task (which consisted of a simulation using four images, one of each category) to guarantee that the instructions were fully understood. Each stimulus (face) was presented after a fixed inter-stimulus interval (ISI; 1000ms) and fixation point (500ms) for 2000ms, and followed by an instructions screen asking to rate the face on each of the four traits, with no time limit. The images of the faces were presented in random order, with a resolution of 1280 x 1024 pixels. Task 1 lasted around 30mins. Faces varied in gender (male vs. female) and skin tone (light vs. dark).

We selected randomly forty pictures (twenty male and twenty female) of bald Caucasian faces from the database generated with FaceGen Modeller 3.1 (Singular Inversions 2004), as described in Oosterhof and Todorov (2008).



20 Light skinned males | 20 Light skinned females | 20 Dark skinned males | 20 Dark skinned females

Fig. 1-1: Task 1 Stimuli

From these, forty more dark skinned faces were created through the image editing software ADOBE PHOTOSHOP CS5. In this darkening process based on Hue, Saturation and Lightening adjustments[7], only the skin tone was altered. Altogether, eighty faces within four categories served as experimental stimuli (See Figure 1-1).

In Task 2, we created a competing visual stimuli paradigm in which participants had to vote (by mouse-clicking) for one out of 4 ‘candidates’ whose faces were presented simultaneously on the screen. The faces used were the same as those that had been presented individually in Task 1 and the stimuli presentation followed the same steps used in Task 1: ISI, fixation point and stimuli. There was no time limit for this choice. Each set of images matched the lighter and darker-skin versions of the images of two males and two females, and was presented 4 times in a latin square fashion, that is, each face was presented once in each of the four possible

[7] Darkening adjustment values were +5, +14 and -39 for Hue, Saturation and Lightness respectively, using the white faces as reference.

positions (top-right, down-right, top-left, down-left). The sets were presented randomly as in Task 1. An example with the sequence is presented in the figure 1-2 below. The same software and equipment used in Task 1 was used to design and present this task.

We were interested in understanding which faces would be selected more frequently and which facial features, traits, and social categories (namely gender and skin tone), would influence their choice. In both tasks, the eye-tracking apparatus recorded a number of different measures; in this chapter, we report only the time to first fixation of the facial stimuli.

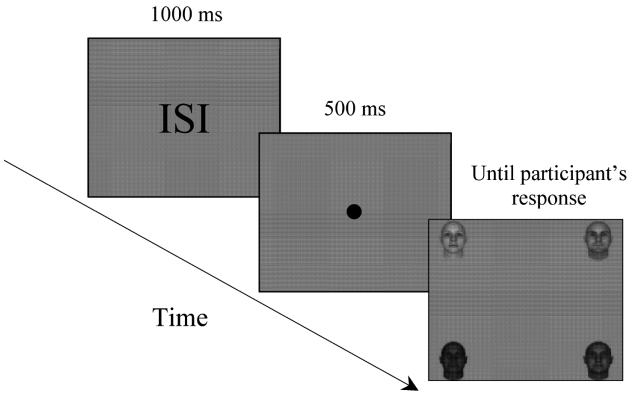


Fig. 1-2: Sequence and competing visual stimuli (latin square; example) used in task 2

In order to minimize the contrast during picture presentation the background was presented on a grey colour (RGB: 150, 150, 150). All images were resized to a resolution of 320x256 pixels. Altogether, 80 trials were presented at the corners of the screen (one image per corner) in the latin square design. The size of the pictures size was 7.69 ° X 6.26 ° of visual angle at a viewing distance of 60 cm.

The instructions asked the participants to choose, in each image, the face of the candidate who they perceived to be the best possible candidate and the one to whom they would give their vote if this were a real election scenario. To register their choice, they had only to click on the selected candidates' face. This would trigger the next stimuli sequence. The duration of this task ranged from 7 to 15 minutes.

At the end of the second task, the participants were taken to another room where they filled in the demographic/political participation questionnaire, as well as the consent form. They were also debriefed about the experiment in general, asked to make suggestions and recommended to

make no comments to their colleagues about the experiment details and objectives.

The whole experiment was carried out in the Experimental Laboratory at ULHT during the month of September, 2012, between 8 AM -12 PM.

Apparatus

Stimuli were presented and eye movements were recorded on a Tobii-T60 Eye Tracking System (Tobii Technology AB, Sweden), integrated into a TFT 17" monitor, and connected to an Intel core2duo 6550 Desktop computer. Gaze data of both eyes were recorded at 60 Hz with an average accuracy of 0.5 visual angle.

Measures

Image rating scales. Each image was rated on a nine point scale (1 – Not at all [trait], to 9 – Extremely [trait]) by every participant on four different traits: 'attractive', 'competent', 'trustworthy', and 'threatening' selected from the nine traits on which the original images have already been rated by a sample of US undergraduate students (the other five traits being 'dominant', 'frightening', 'extroverted', 'likeable', and 'mean'). We chose these four traits as previous studies suggested that they would be the most promising in either predicting electoral results or showing significant differences across groups.

Results[8]

Trait inferences (Task 1)

The aims of this first task were a) to test the effects of gender and skin tone on the evaluation of each face on the inference of each of the four traits (attractiveness, competence, trustworthiness and threat) and b) to test the relation between these and voting choices of Task 2. We aggregated, for each participant, the ratings on each trait for all the faces of each specific category to which they belonged (light-skinned males, light-skinned females, dark-skinned males, and dark-skinned females). (see Table 1-1).

[8] The statistical analysis was performed using IBM SPSS 20.0.

Table 1-1: Mean ratings on inferred traits per face category

	Light-skinned				Dark-skinned			
	Males		Females		Males		Females	
	M	*(SD)*	*M*	*(SD)*	*M*	*(SD)*	*M*	*(SD)*
Attractive	2.8	(1.18)	3.34	(1.36)	3.13	(1.28)	3.92	(1.85)
Competent	4.5	(1.20)	4.74	(1.34)	4.78	(1.28)	4.94	(1.48)
Trustworthy	4.3	(1.26)	4.77	(1.49)	4.82	(1.28)	5.05	(1.55)
Threatening	2.6	(1.02)	2.42	(1.16)	3.13	(1.27)	2.40	(1.34)

We then carried out mixed repeated-measures ANOVA for each of the four traits with two within subjects factors [target-gender (male vs. female) and target-colour [light vs. dark]) and one between-subjects factor (participant gender). Greenhouse-Geisser correction was applied when the sphericity assumption was violated (Field 2013). Bonferroni correction was used for all pairwise comparisons.

On attractiveness, we found a significant effect of target-gender, F (1, 26) = 11.70, p = .002, a significant effect of target-colour, F (1, 26) = 9.14, p = .006, qualified by a marginal interaction-effect of target-gender and target-colour, F (1, 26) = 3.06, p = .092, itself qualified by a triple interaction effect of target-gender, target-colour, and participant-gender, F (1, 26) = 5.56, p = .026. We therefore analysed the effects of male and female participants separately. For men, we found a marginal effect of target-gender, F (1, 11) = 4.71, p = .053, and a significant effect of target-colour, F (1, 11) = 4.96, p = .048, qualified by an interaction effect of target-colour and target-gender, F (1, 11) = 6.11, p = .031**.** T-tests indicated that men rated dark-skinned females as more attractive than dark-skinned males, t (11) = 2.59, p = .025, and more attractive than light-skinned females, t (11) = 2.77, p = .018, but did not rate light-skinned males and females, nor light-skinned and dark-skinned males, differently (*ns*). In other words, males found dark-skinned female targets to be particularly attractive. For females, we found a significant effect of target-gender, F (1, 15) = 7.60, p = .015, and a marginal effect of target-colour, F (1, 15) = 3.98, p = .065, females tended to rate other females as more attractive than males, and dark-skinned target as more attractive than light-skinned targets.

On trustworthiness, we found a marginal effect of target-gender, F (1, 26) = 3.88, p = .060, and a significant effect of target-colour, F (1, 26) = 7.86, p = .009, qualified by a marginally significant interaction effect of

participant-gender and target-gender, F (1, 26) = 2.00, p = .072, itself qualified by a triple interaction effect of gender, target-gender, and target-gender, F (1, 26) = 5.303, p = .030. We again analysed the effects of males and females separately. For males, there was only a simple effect of target-colour, F (1, 11) = 4.87, p = .049: dark-skinned targets were perceived to be more trustworthy than light-skinned targets. For females, there was a target-gender effect, F (1, 15) = 4.73, p = .046, as well as a marginal target-colour effect, F (1, 15) = 3.15, p = .096, which were qualified by a two-way interaction effect, F (1, 15) = 5.13, p = .039. T-tests indicated that females rated light-skinned males as less trustworthy than dark-skinned males, t (15) = 2.26, p = .039, as well as than light-skinned females t (15) = 4.11, p = .001; there were no differences between dark-skinned females and dark-skinned males or light-skinned females, *ns*.

On competence, results showed only a significant main effect of target-colour, F (1, 26) = 4.55, p = .043, indicating that participants rated dark-skinned candidates as more competent than light-skinned candidates.

On threat, we found a main effect of target-gender, F (1, 26) = 13.49, p = .001, which was qualified by an interaction effect between gender and target-gender F (1, 26) = 9.34, p = .005, as well as an interaction effect between target-gender and target-colour, F (1, 26) = 4.41, p = .046. To analyse this interaction, t-tests showed that light-skinned males were rated as more threatening than light-skinned females, t (27) = 2.18, p = .038, but less threatening than dark-skinned males, t (27) = -2.35, p = .026, whereas dark-skinned females were rated less threatening than dark-skinned males, t (27) = 3.40, p = .002, and no different from light-skinned females, *ns*. In other words, males were rated more threatening than females, but dark-skinned males particularly so. To analyse the interaction between participant-gender and target-gender, we analysed the effects of males and females separately. For females, we found only an effect of target-gender, F (1, 15) = 19.33, p = .001, indicating that male targets were rated more threatening than female targets. For males, there were no significant effects.

In sum, dark-skinned female targets were rated highest on attractiveness, trustworthiness, and competence, whereas light-skinned males were rated lowest on all three positive traits. However, dark-skinned males stood out as being rated the most threatening. Intriguingly, light-skinned males were rated poorly in terms of trustworthiness when compared with other categories.

Participant race effects (Task 1)

As we had a very small number of Black participants, we did not test the effect of participant-race together with that of participant-gender and target race and gender. Instead, we tested it separately, for each trait assessment and for each target gender/colour face type, with the non-parametric Mann-Whitney test, since there are some issues concerning group size [White/Caucasian (n = 24) and Black/African (n = 4) and homogeneity of variances. The only effect was on perceived threat of the light-skinned male stimulus faces, U = 17.00, p = .042, with White participants (MR = 15.79) rating those faces higher on perceived threat than Black participants (MR = 6.75), as well as on the perceived threat of light-skinned female face, U = 13.00, p = .019, with White/Caucasian participants (MR = 15.95) rating these faces significantly higher on threat than Black/African participants (MR = 5.75). Lastly, participant race was also a factor on the level of perceived threat in Dark-skinned Females, U = 17.50, p = .042. Like in the previously described comparisons, White/Caucasian participants (MR = 15.77) showed higher values than Black/African (MR = 6.88).

Mean time to first fixation (Task 1)

Consistant with an attentional-process account of speed of fixation based on perceptual salience, and assuming that dark skins (Blacks, South Asians, etc) are more salient in Portuguese society than light skins (Whites), darker skinned faces elicited faster fixation (mean times to first fixation in seconds). Dark-skinned males were fixated faster (MTFF; M = .26; SD = .22) than dark-skinned females (M = .52; SD = .22), t (24) = -5.918, p = .000, as well as than light-skinned males (respectively M = .32; SD = .24 and M = 1.01; SD = .53), t (19) = -6.23, p < .000. Dark-skinned females also had lower MTFF than light-skinned females, t (19) = -4.81, p < .000 (respectively M = .53; SD = .21 and M = .98; SD = .46). There were no differences, however, between light-skinned males and females. In sum, dark-skinned faces elicited lower MTFF's than light-skinned faces, but dark-skinned male faces elicited even lower MTFF's than dark-skinned female faces.

Candidate choices (Task 2)

To test the effect of target-group race and gender on candidate selection, we again carried out a mixed repeated-measures ANOVA on the

number of selected faces from each category with two within subjects factors [target-gender (male vs. female) and target-colour [light-skinned vs. dark-skinned]) and one between subjects factor (participant gender). Participants chose from among 19 faces per category presented 4 times each (and thus had a total of 80 chances to select from each category). Greenhouse-Geisser correction was applied, as the sphericity assumption was violated (Field 2013).

Results indicated a main effect of target-colour, F (1, 28) = 16.63, p < .001, indicating that dark-skinned targets were chosen more than light-skinned targets, but this was qualified by an interaction effect of target-colour and target-gender, F (1, 28) = 5.48, p = .027. T-tests indicate that dark-skinned females (M = 23.73; SD = 15.89) were chosen significantly more than light-skinned females (M = 9.40; SD = 6.34), t (29) = 4.47, p < .001. There were no other significant differences (light-skinned males, M = 13.17, SD = 11.78; dark-skinned males, M = 16.57; SD =12.46). (Figure 1-3).

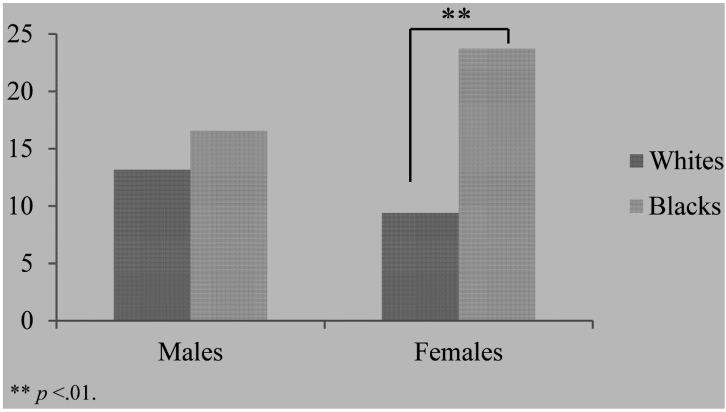


Fig. 1-3: Average number of selections for "favourite face" across categories

Mean time for first fixation (Task 2)

To test the effect of target-group colour and gender on mean time to first fixation (MTFF) with the competing visual stimuli paradigm, we again carried out a mixed repeated-measures ANOVA with two within subjects factors [target-gender (male vs. female) and target-colour [light-skinned vs. dark-skinned]) and one between subjects factor (participant gender). Greenhouse-Geisser correction was once again applied as the sphericity assumption was violated (Field 2013).

Results indicated no main effects, but we found a marginal interaction effect of target-colour and target-gender, F (1, 28) = 3.50, p = .072, qualified by a triple interaction between these two within-subjects factors and the between subjects factor F (1, 28) = 5.84, p = .022. We therefore analysed males and females separately. For men, the results show that light-skinned candidates had higher MTFF (M = 1.50, SD = .140) than dark-skinned candidates (M = 1.25, SD = .110). Furthermore, light-skinned female candidates elicited significantly higher MTFF (M = 1.56, SD = .170) than light-skinned male candidates (M = 1.43, SD = .118). No significant results were found for women. Overall, the results show that light-skinned candidates' faces had higher MTFF when perceived by men and that light-skinned females had the highest MTFF, again only when considering men. In other words, men's attention was drawn faster to dark-skinned targets.

Association of traits with candidate choices

To understand the relation between trait inferences and candidate preferences, we checked the correlations between participants' mean ratings of each trait inference (trust, competence, attractiveness, and threat) for each gender-colour facial combinations (light-skinned males, light-skinned females, dark-skinned males, dark-skinned females), on the one hand, and the number of targets with that gender-colour combination that each participant chose. We found only two marginally significant correlations for our small sample size: for light-skinned male targets, competence ratings had a moderate negative correlation with number of choices (r = -.36, p = .062); and for dark-skinned male targets, threat ratings had a moderate negative correlation with number of choices (r = -.37, p = .053). The unusual, though non-significant, negative correlation between number of choices of light-skinned male candidates and their perceived competence may not necessarily mean that participants actually prefer less competent candidates. It might be, rather, that at a time of disappointment with failed economic policies, participants are wary of their impressions of candidates' competence. Our data, however, do not allow us to verify this hypothesis.

Discussion

In Task 1, we were interested in understanding effects of target gender and skin tone on trait inferences. We found that women were rated as more attractive than men, and dark-skinned targets more attractive than their

lighter-skinned counterparts. For evolutionary reasons to do with their greater value in terms of reproductive resources, women are usually considered more attractive than men. However, the higher rating of attractiveness for darker skinned targets is not as obvious and runs counter to conventional wisdom that darker skin is associated to lower social status. Nevertheless, the Portuguese are a Southern European people, and regard tanning as both natural and attractive, which might partly explain this.

However, these effects were similar to those on the ratings of trustworthiness: lighter-skinned males were identified as being less confidence-worthy than other categories. Previous studies show that more attractive people are generally perceived as being morally better (Dion, Berscheid and Walster 1972; Langlois, et al. 2000), although it can also be the case that it is less attractive people who are more negatively perceived (Griffin and Langlois 2006). In any case, our results similarly suggest that there is a relation between attractiveness and trustworthiness. Also, Portuguese politicians, most of whom are White males, are typically rated as untrustworthy: this could have had an effect on the ratings of the targets, who were presented as potential political candidates. Finally, males were judged more threatening than females, and dark-skinned males more than light-skinned males, which could reflect the stereotype of Black males. Conversely, however, dark-skinned candidates were seen as more competent than light-skinned candidates, which does not correspond to the stereotype of Blacks.

As for the eyetracking-based measures of mean time to first fixation (MTFF) in Task 1, these showed that dark-skinned faces were fixated faster than light-skinned faces, and dark-skinned males fastest of all. Note that, on the one hand, darker-skinned faces were rated as more attractive but, on the other hand, darker-skinned male faces were also rated as more threatening. This suggests that both of these traits – positive and negative – attract attention faster, as they are both salient, independently of their valence.

Results of Task 2 suggest that the social context of presentation of the target-faces was very relevant for participants' inferences and choices. When asked to select the most suitable candidate, participants did not choose the ones most prototypical of Portuguese politicians (given that most of these are White males), but rather preferred dark-skinned candidates. At first glance, this is consistent with their ratings of attractiveness, which some studies have found to be related to electoral performance (Langlois, et al. 2000), in Task 1. Conversely, the higher rating of dark-skinned candidates on threat would have led us to predict

the revers pattern (as indicated by Mattes and colleagues, 2010). However, threat is the trait with the lowest mean values, which might explain its lack of significant impact on candidate choice.

We expected the same pattern of results on MTFF as that in Task 1. However, we found no significant differences were found between categories. This indicates that further testing is required in order to identify the most salient aspects of ET and their relative importance in the explanation of the candidate's selection process.

Conclusions

The results show some usefulness of ET as a technique with potential to help explain the most salient aspects of attentional processes in candidate selection and political voting decision making. The fact that the most selected categories (in Task 2) were also the ones that had lower MTFF (in Task 1) indicates that some underlying aspects of attention might contribute to explain candidate selection. Attractiveness seems to have played the most significant role in differences in candidate selection rate between categories. Competence, on the other hand, did not play a significant role in candidate selection, which could be mostly due to the fact that it was less distinctive between categories.

Given the exploratory nature of the study, the authors choose not to previously define hypothesis, since this would probably lead to greater confusion in the discussion of the results and add little to the current state-of-the-art in the field. Nevertheless, there is a sound body of knowledge in trait inferences from facial features and these specific questions were already discussed in other studies. However, ET results are harder to discuss considering the limitations in the current state-of-the art. Also, the small sample size demands prudence in interpretation. Finally, with a larger sample size, and in order to determine causality, crossover designs with alternate order of tasks should be used.

Another issue concerns the stimuli used. On one hand, the use of randomly generated faces solves the problems associated with ecological validity and prior knowledge of particular politicians that could lead to biased results. However, it also adds to the questions about the ecological validity of doing political experiments in laboratory. Moreover, participants mentioned the fact that a lot of faces looked too similar to each other, which interfered with task motivation.