

## IN BRIEF

- People make judgements about the personal characteristics of photographed individuals based on dental appearance.
- Teeth that appear whitened elicit preferable judgements in comparison to normal enamel. This has implications for whether cosmetic tooth whitening should be provided by the NHS.
- Teeth that appear decayed elicit judgements that are unfavourable in comparison to normal enamel.

# The influence of tooth colour on the perceptions of personal characteristics among female dental patients: comparisons of unmodified, decayed and 'whitened' teeth

S. Kershaw,<sup>1</sup> J. T. Newton<sup>2</sup> and D. M. Williams<sup>3</sup>

**Objective** Physical appearance plays a key role in human social interaction and the smile and teeth are important features in determining the attractiveness of a face. Furthermore, the mouth is thought to be important in social interactions. The purpose of this study was to determine the relationship between tooth colour and social perceptions. **Methods** Cross-sectional survey. One hundred and eighty female participants viewed one of six images, either a male or a female digitally altered to display one of three possible dental statuses (unmodified, decayed, or whitened). The images were rated on four personality traits: social competence (SC), intellectual ability (IA), psychological adjustment (PA), and relationship satisfaction (RS). **Results** Decayed dental appearance led to more negative judgements over the four personality categories. Whitened teeth led to more positive appraisals. The gender of the image and the demographic background of the participant did not have a significant effect on appraisals. **Conclusion** Tooth colour exerts an influence on social perceptions. The results may be explained by negative beliefs about dental decay, such as its link with poor oral hygiene.

## INTRODUCTION

Physical appearance plays a key role in human social interaction.<sup>1</sup> Attractive people enjoy numerous social benefits because of their beauty, in fact Dion *et al.*<sup>2</sup> found a 'what is beautiful is good' stereotype. Support for this proposition has been provided by Eagly *et al.*<sup>3</sup> who, in a meta-analysis of studies, found that attractive people are perceived as more popular, sociable, and extraverted, as well as sexually assertive, and happy. Recent work has found that good-looking people are perceived to be of higher intelligence and integrity than their counterparts rated as less attractive.<sup>4</sup>

Physical appearance similarly has an impact on success in relationships. This effect is apparent from the first meeting, although there are gender differences. Berry and Miller<sup>5</sup> surreptitiously filmed 51 unacquainted male-female couples and then asked the participants and neutral observers to rate the interaction. Participants' personality traits were also measured. They found women's physical attractiveness – but not their personality scores – predicted their own, the male stranger's, and independent observers' evaluations of the interaction. Conversely, men's personality scores – extraversion in particular – predicted their own and observers' ratings of the interaction. This suggests that the women's appearance was important to how satisfied men were with the interaction, but the men's appearance was not important to how satisfied women were with the interaction. Evolutionary theories of interpersonal attraction such as Triver's parental investment model<sup>6,7</sup> offer an explanation of the finding that

men attach higher value to physical attractiveness in a mate than women. This model proposes that women are more likely to seek a mate based on cues which indicate resource acquisition skills since these will increase the chances of their offspring surviving.

The appearance of the smile and teeth are important features determining the attractiveness of a face. The significance of the mouth is thought to be connected to its importance in social interactions.<sup>8</sup> For example, a good dental appearance is regarded as important in certain prestigious or highly visible professions.<sup>9</sup>

However, the impact of dental appearance goes beyond the attractiveness of a face, to affect others' perceptions about the personal traits of the person. In a study by Shaw<sup>10</sup> the influence of children's dento-facial appearance on their social attractiveness was investigated. Children with a normal dento-facial appearance were judged to be better looking, more desirable as friends, and more intelligent. Shaw concluded that

<sup>1-3</sup>Department of Oral Health Research Services and Dental Public Health, Dental Institute, King's College, Denmark Hill Campus, Caldecot Road, Denmark Hill, London, SE5 9RW

\*Correspondence to: David Michael Williams  
Email: david.2.williams@kcl.ac.uk



Picture 1 Male White Teeth



Picture 4 Female White Teeth



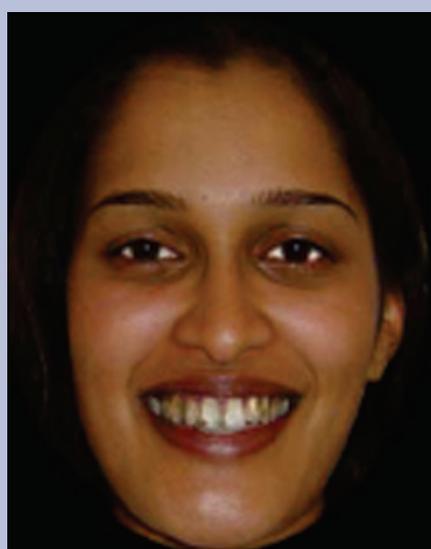
Picture 2 Male Original Teeth



Picture 5 Female Original Teeth



Picture 3 Male Decayed Teeth



Picture 6 Female Decayed Teeth

Fig. 1 Photographs used in the study

dental appearance influences the perception of individuals of both genders. Previous work in the area of the social importance of dental appearance has often been limited by asking participants to rate individuals with contrasting features.<sup>11,12</sup> However, this did not allow researchers to control for facial features not of interest to the hypothesis. The advent of digital photography allows researchers to manipulate key aspects of an image, such as the teeth, while holding all other features constant. A number of studies have used methodology based on the manipulation of images to investigate the impact of dental appearance on social judgements. That is, they have used photographs showing a different dental appearance within otherwise standardised photographs of individuals. Such studies have demonstrated that people are perceived more favourably over a range of judgements, including numerous personality traits, when they have normal dentition as opposed to abnormal tooth colour (caused by caries or severe dental fluorosis) or tooth arrangement.<sup>10,13-19</sup>

The purpose of this study was to determine the relationship between tooth colour and social perceptions. Specifically it sought to determine whether tooth discolouration had a negative impact on social perceptions, and if in contrast, tooth whitening had a positive impact on social perceptions in comparison to the natural tooth colour. If tooth whitening does improve social perceptions then this could be used to inform dental public health policy regarding tooth whitening procedures.

## METHOD

The Ethics Committee of the Institute of Psychiatry, King's College London, approved the current study.

A cross-sectional design was used. Participants viewed a single image from a possible range of six images. There were two independent variables: 1) dental status, divided into three levels that included whitened teeth, original teeth and decayed teeth; and 2) gender of face. The dependent variables were scores given on scales designed to measure the four personality measures under investigation.

## Participants

Participants were 180 female dental patients recruited from a dental practice in South London.

## Materials

### Photographs

In total six photographs of subjects smiling in a way that exposed their anterior teeth were used. Subjects were one adult Asian male and one adult Asian female (the ethnic origin of both subjects was the Indian subcontinent, see Fig. 1) whose dental appearance was subsequently modified. Three dental statuses were created for each subject using digital modification. These were:

1. Whitened, flawless teeth (DS1)
2. Unmodified original teeth (DS2)
3. Digitally modified decayed teeth (DS3).

All facial features were standardised apart from the condition of the teeth. Jewellery and glasses were not worn, and the background was kept constant.

### Questionnaire

The questionnaire comprised participants' demographic details plus information on their level of education, frequency of attendance at the dental practice, and a self-rating of their oral health. Following this, participants rated one of the photographs in each of four areas: social competence (SC), intellectual ability (IA), psychological adjustment (PA), and relationship satisfaction (RS). There were three items for each of these constructs and participants responded by indicating, on a five point Likert scale, the extent to which they perceived the subject in the photograph to possess certain characteristics. For example, under the category social competence, one item asked 'How friendly does the individual appear?' The participant could choose from 'very unfriendly' (0), 'quite unfriendly' (1), 'indifferent' (2), 'quite friendly' (3) and 'very friendly' (4) (see Appendix A for the full list of items). These scales were taken from Newton *et al.*<sup>13</sup>

Cronbach's coefficient test was used to determine the internal consistency of the scales used for each characteristic category. Substantial consistency was found within the scales of the categories

SC (alpha = 0.86), IA (alpha = 0.90) and RS (alpha = 0.82), but the category PA (alpha = 0.61) was found to show only moderate internal consistency, although this is not unusual when a scale has fewer than ten items.<sup>20</sup>

Analysis of variance (ANOVA) was used to determine the effect of the independent variables on the personality scale scores.

### Procedure

Participants were approached in the waiting room of the dental surgery before their appointment and the study was explained to them. After obtaining their consent participants were shown one of the photographs and then given the questionnaire to complete. Each photograph was assigned a number from 1 to 6 and participants were randomly allocated to one of the photographs before they were approached. Participants were initially told the purpose of the study was to explore 'how we make judgments about people'. The true purpose of the study was only explained after respondents had given their ratings.

## RESULTS

One hundred and eighty of the 201 dental patients approached agreed to participate (a response rate of 90%). All participants were female and the average age was 24.3 years old (SD = 3.9). The majority had been educated to A-level standard or higher (77%), and rated their oral health as 'good' or better (73%). The socio-demographic characteristics of participants are summarised in Table 1. Comparisons were made of all socio-demographic characteristics across all six experimental groups. None of the characteristics (ethnicity, education level, self-rated oral health, dental attendance) showed a significant effect (all  $p > 0.05$ ).

Table 2 shows the mean ratings of social competence, intellectual ability, psychological adjustment, and relationship satisfaction across the six experimental groups.

One-way ANOVA found significant differences in ratings of all characteristics across the dental status variable (see Table 2). In order to explore this effect further, four General Linear Models were

**Table 1** Socio demographic characteristics of participants

		N
<b>Total number of participants</b>		<b>180</b>
Age	Mean	24.3
	SD	3.9
Ethnicity	White N (%)	81 (45)
	Other Ethnicity N (%)	99 (55)
Education level	Up to GCSE	41
	Up to A-level	80
	Tertiary Education	59
Self-rated oral health	Poor or Fair	48
	Good	83
	Very good or Excellent	49
Attendance	Only when in trouble	29
	Occasional	88
	Regular	63

run. General Linear Model is a general formula which describes a score as a sum of a constant, the weighted influence of several variables, and error. It is similar to a multiple regression equation, but differs in that the error is included and the sum of influences is the actual score (rather than the predicted score) on the dependent variable.<sup>21</sup> The models were tested with the following dependent variables: tooth appearance (three levels – decayed, original, whitened), gender of image (two levels – male, female), age of participant (entered as a covariate), ethnicity (two levels – white, other), level of education (three levels – up to GCSE, up to A-level, up to tertiary), self-rated oral health (three levels – poor or fair, good, excellent), and dental attendance (three levels – only when in trouble, occasionally, regularly). Only one interaction term (dental status\* gender of image) was explored in the model, since the sample size was not sufficient to explore the full factorial model with the number of variables. The results of these models are summarised in Table 3.

As can be seen from Table 3, the only significant variable was dental status, and it was highly significant across all four personality measures. The gender of the photograph did not have any effect

Table 2 Mean personality ratings by photograph

		Photograph						F-value
		Female Decay	Female Original	Female Whitened	Male Decay	Male Original	Male Whitened	
Social Competence	Mean	5.7 <i>a</i>	7.7 <i>b</i>	9.6 <i>c</i>	5.9 <i>a</i>	7.5 <i>b</i>	10 <i>c</i>	27.1*
	SD	2.24	1.83	1.69	2.19	1.90	1.62	
Intellectual Ability	Mean	3.8 <i>d</i>	7.9 <i>e</i>	9.3 <i>f</i>	4.8 <i>d</i>	7.8 <i>e</i>	9.6 <i>f</i>	41.2*
	SD	2.17	1.67	2.35	1.95	1.85	2.13	
Psychological Adjustment	Mean	6.2 <i>g, h</i>	7.9 <i>h, i</i>	9.2 <i>j</i>	6.9 <i>g</i>	8.0 <i>i</i>	9.0 <i>i, j</i>	14.19*
	SD	1.92	1.65	1.37	1.63	1.68	1.71	
Relationship satisfaction	Mean	4.4 <i>k</i>	8.1 <i>l</i>	9.1 <i>l</i>	5.7 <i>k</i>	7.7 <i>l</i>	9.1 <i>l</i>	23.2*
	SD	2.54	1.78	2.09	2.90	1.53	2.06	

\* $p < 0.001$ 

a-l indicate homogenous subsets

Table 3 General Linear Models

Main effects, covariates and interaction	Degrees of freedom	social competence		intellectual ability		psychological adjustment		relationship satisfaction	
		F-value	Sig.	F-value	Sig.	F-value	Sig.	F-value	Sig.
Dental status of image	2	62.9	P < 0.001	102.2	P < 0.001	35.9	P < 0.001	51.6	P < 0.001
Gender of image	1	0.3	ns	1.9	ns	0.4	ns	1.0	ns
Ethnicity of participant	1	0.4	ns	0.2	ns	0.4	ns	0.2	ns
Education of participant	2	1.7	ns	3.3	ns	2.3	ns	0.3	ns
Self-rated oral health of participant	2	1.4	ns	0.1	ns	1.8	ns	0.4	ns
Dental attendance of participant	2	0.1	ns	0.4	ns	0.3	ns	0.3	ns
Age of participant	1	1.3	ns	0.6	ns	0.3	ns	0.4	ns
Dental status of image* Gender of image	2	0.5	ns	0.3	ns	0.5	ns	1.8	ns

either as a main effect or as an interaction term with dental status. None of the participants' socio-demographic characteristics had any effect on the personality ratings they gave to the images. Table 4 gives the estimated marginal means for the three levels of dental status.

## DISCUSSION

The findings of the current study showed participants responded to the presence of discoloured teeth with poorer ratings of social competence, intellectual ability, psychological adjustment and relationship status. This supports previous work in this area which has shown tooth discolouration negatively impacts on perceptions of personality traits and characteristics<sup>13,14,16,18,19</sup> and also extends it by demonstrating that

individuals with whitened teeth are given higher ratings than individuals shown with their original tooth colour. Further to this, a recent survey run on behalf of the American Academy of Cosmetic Dentistry<sup>22</sup> found that when rating photographs of strangers favourable perceptions increased across a broad range of traits after cosmetic dentistry compared to before the dentistry (the cosmetic procedures were not specified). Perceptions of attractiveness, popularity with the opposite sex, wealth, and career success showed the greatest improvement, but perceptions of how intelligent, happy, friendly, interesting, kind, and sensitive to other people the subject was also increased. These findings have important implications for dentistry, which has largely focussed on the functional

aspects of health. It appears, based on the current and previous research, that poor dental appearance may lead others to judge people negatively over a range of personality categories. This could clearly have implications for any number of social interactions, including romantic relationships, friendships and even career prospects. Given this, it seems likely that increasing numbers of dental patients will request tooth whitening, and other cosmetic procedures. Therefore dentists and dental policy should be prepared to either perform increasing numbers of these procedures, or be prepared to refuse them to patients who want them to be provided by the NHS.

While the present study focused on the social consequences of dental appearance, there is already some evidence

that individuals' satisfaction with their own appearance may be affected by outside factors, and that satisfaction with their appearance is important for their psychological well being. Psychological research into body satisfaction has suggested that mass media standards of attractiveness can be internalised by the viewer and thus exacerbate body dissatisfaction.<sup>23–25</sup> Moreover, recent work has shown that orthodontic and orthognathic patients display more facial dissatisfaction after viewing idealised images of facial photographs than controls,<sup>26</sup> which suggests media standards of dental appearance may influence individuals' satisfaction with their own appearance, and by doing so impact on their well being. This may explain why the photos of individuals with whitened teeth are ascribed more favourable ratings across the personality traits: individuals may be guided in their ratings by the values portrayed in media images of perfect smiles. It is also possible that the desire for an enhanced appearance, such as whitened teeth, is driven by evolutionary processes<sup>27</sup> and that the media merely amplifies, rather than causes this preference.

The fact that the results indicated tooth whitening was appraised more positively than normal dentition may be instructive for the dental profession in terms of the future requests for treatment. Balancing patients' psychological well being with their cosmetic desire for a perfect smile and possibly unrealistic expectations may become an important challenge for dentistry and for the National Health Service and other healthcare providers.

### Limitations of the present study

The sample used was not representative of the general population of the UK. They were all female and tended to be younger and better educated than the general population. Moreover, they were all dental patients recruited from the waiting room of a dental surgery, and are therefore more likely to have been focussed on the dental appearance of the photographs than the general population.

While it was interesting to consider the female perspective since psychological research on body satisfaction has found

**Table 4** Estimated marginal means of personality assessment scores for groups defined by dental status from General Linear Model

Personality characteristic	Photos of whitened teeth	Photos of original teeth	Photos of teeth with decay
Social Competence Mean 95% CI	9.8 9.3 – 10.3	7.6 7.1 – 8.1	5.7 5.2 – 6.2
Intellectual Ability Mean 95% CI	9.5 8.9 – 10.0	7.9 7.3 – 8.4	4.3 3.8 – 4.8
Psychological Adjustment Mean 95% CI	9.1 8.6 – 9.5	8.0 7.5 – 8.4	6.6 6.1 – 7.0
Relationship Status Mean 95% CI	9.1 8.6 – 9.7	7.9 7.4 – 8.5	5.0 4.5 – 5.6

females tend to be more sensitive regarding their own appearance than males,<sup>28</sup> this does reduce the extent to which these findings can be applied to the general population. Furthermore, since all of the participants were dental patients they would be expected to be aware of dental decay and to know that it is associated with poor oral hygiene. This may have created a bias in those participants who viewed the decayed images, as they could have made judgements based on their knowledge of dental decay (they may have assumed the subject had poor oral hygiene). It would be interesting to examine a similar group of participants in their appraisals of varying degrees of a condition such as dental malocclusion. Since malocclusion does not result from dental neglect, participants' knowledge of oral hygiene would not be relevant to their judgements. However, the advantage of a dental sample over the general public and student samples used in previous research is that it provides an insight into the views of a group who might reasonably be expected to be cognitively 'cued' towards dental appearance.

In addition to potential limitations with the participants used, there was also a limited spectrum of personal characteristics on which the participants were asked to appraise the subject faces. Had qualities regarding the 'darker side of beauty' been available to the participants (for instance 'how vain is the individual likely to be?'), a more comprehensive picture of the overall perceptions of dental appearance could have been reached. In addition to the personal characteristics used the

photographs were of subjects of a different ethnic origin to the majority of the respondents and this may also have had an impact on judgements about personal characteristics.

### Future research

To examine the field of perceptions of dental appearance in more depth, larger samples from across the UK and from overseas countries would need to be studied. These samples should be more representative of the general population, ie include males, non-dental patients, plus a greater proportion of older participants and participants less well educated than our sample. And since a city practice was used it would be beneficial to recreate the study in a rural area.

It could also be valuable to recreate the study with different dental conditions, for instance incisal crowding, fluorosis and overbites, which would allow further study of the possibility that negative appraisals are made about caries on the basis of assumed poor oral hygiene. Finally, other personality categories could be included to examine the 'darker side of beauty'. Recent studies by Williams *et al.*<sup>18,19</sup> found both severe dental fluorosis and caries were associated with a wide range of personality traits and it would be interesting to identify any negative implications of being attractive and having a sound dental appearance.

### SUMMARY

Dental decay was found to be associated with lower levels of social competence, intellectual ability, psychological

adjustment, and relationship satisfaction. It was also associated with lower ratings of physical attractiveness. This may be due to negative beliefs about dental decay, such as its link with poor oral hygiene. A sound or whitened dental appearance was related to positive appraisals and higher attractiveness, and whitened tooth appearance appeared to be preferred to unmodified enamel. This may be caused by media influences, particularly since the participants were young adults, who may be more vulnerable to the effects of the media than older generations. Taken together these findings suggest the 'what is beautiful is good' stereotype is applicable to dental appearance.

- Rumsey N. Historical and anthropological perspectives on appearance. In Lansdown R, Rumsey N, Bradbury E, Carr A, Partridge J (eds). *Visibly different: coping with disfigurement*. pp 91-101. Oxford: Butterworth-Heinemann 1997.
- Dion K K, Berscheid E, Walster E. What is beautiful is good. *J Pers Soc Psychol* 1972; **24**: 285-290.
- Eagly A H, Makhijani M G, Ashmore R D, Longo L C. What is beautiful is good, but...: A meta-analytic review of research on the physical attractiveness stereotype. *Psychol Bull* 1991; **110**: 109-128.
- Kanazawa S, Kovar J L. Why beautiful people are more intelligent. *Intelligence* 2004; **32**: 227-243.
- Berry D S, Miller K M. When boy meets girl: attractiveness and the five-factor model in opposite-sex interactions. *J Res Pers* 2001; **35**: 62-77.
- Trivers R. Parental investment and sexual selection. In Campbell B (ed). *Sexual selection and the descent of man*. pp 136-179. London: Heinemann Educational, 1972.
- Trivers R. *Social evolution*. Menlo Park, CA: Benjamin/Cummings, 1985.
- Macgregor F C. Social and psychological implications of dentofacial disfigurement. *Angle Orthod* 1970; **40**: 231-233.
- Jenny J, Proshok J M. Visibility and prestige of occupations and the importance of dental appearance. *J Can Dent Assoc* 1986; **52**: 987-989.
- Shaw W C. The influence of children's dentofacial appearance on their social attractiveness as judged by peers and lay adults. *Am J Orthod* 1981; **79**: 399-415.
- Ellwood R P, O'Mullane D. Enamel opacities and dental esthetics. *J Public Health Dent* 1995; **55**: 171-176.
- Riordan P J. Perceptions of dental fluorosis. *J Dent Res* 1993; **72**: 1268-1274.
- Eli I, Bar-Tal Y, Kostovetzki I. At first glance: social meanings of dental appearance. *J Public Health Dent* 2001; **61**: 150-154.
- Feng X P, Newton J T, Robinson P G. The impact of dental appearance on perceptions of personal characteristics among Chinese people in the United Kingdom. *Int Dent J* 2001; **51**: 282-286.
- Kerosuo H, Hausen H, Laine T, Shaw W C. The influence of incisal malocclusion on the social attractiveness of young adults in Finland. *Eur J Orthod* 1995; **17**: 505-512.
- Newton J T, Prabhu N, Robinson P G. The impact of dental appearance on the appraisal of personal characteristics. *Int J Prosthodont* 2003; **16**: 429-434.
- Shaw W C, Rees G, Dawe M, Charles C R. The influence of dentofacial appearance on the social attractiveness of young adults. *Am J Orthod* 1985; **87**: 21-26.
- Williams D M, Chestnutt I G, Bennett P D, Hood K, Lowe R. Characteristics attributed to individuals with dental fluorosis. *Community Dent Health* 2006; **23**: 209-216.
- Williams D M, Chestnutt I G, Bennett P D et al. Attitudes to fluorosis and dental caries by a response latency method. *Community Dent Oral Epidemiol* 2006; **34**: 153-159.
- Pallant J. *SPSS survival manual*. Maidenhead: Open University Press, 2001.
- Aron A, Aron E N. *Statistics for psychology*, 2nd ed. New Jersey: Prentice-Hall, 1999.
- American Academy of Cosmetic Dentistry. Can a new smile make you appear more intelligent? <http://www.aacd.com/downloads/doc/AACD%20Smile%20Survey.doc> Accessed on 17 July 2007.
- Durkin S J, Paxton S J. Predictors of vulnerability to reduced body image satisfaction and psychological wellbeing in response to exposure to idealized female media images in adolescent girls. *J Psychosom Res* 2002; **53**: 995-1005.
- Pinhas L, Toner B B, Ali A, Garfinkel P E, Stuckless N. The effects of the ideal of female beauty on mood and body satisfaction. *Int J Eat Disord* 1999; **25**: 223-226.
- Richins M L. Social comparison and the idealized images of advertising. *J Consum Res* 1991; **18**: 71-83.
- Newton J T, Minahs G. Exposure to 'ideal' facial images reduces facial satisfaction: an experimental study. *Community Dent Oral Epidemiol* 2005; **33**: 410-418.
- Etcoff N L. Beauty and the beholder. *Nature* 1994; **368**: 186-187.
- Strahan E J, Wilson A E, Cressman K E, Buote V M. Comparing to perfection: how cultural norms for appearance affect social comparisons and self-image. *Body Image* 2006; **3**: 211-227.

## Appendix A Items used to measure personality traits

**Social competence (SC)**

SC1: The subject works for a big organisation. Rate how popular you think the individual is with other colleagues

0 Very unpopular	1 Quite unpopular	2 Indifferent	3 Quite popular	4 Very popular
------------------	-------------------	---------------	-----------------	----------------

SC2: How friendly does the individual appear?

0 Very unfriendly	1 Quite unfriendly	2 Indifferent	3 Quite friendly	4 Very friendly
-------------------	--------------------	---------------	------------------	-----------------

SC3: How trustworthy does the individual appear?

0 Very untrustworthy	1 Quite untrustworthy	2 Indifferent	3 Quite trustworthy	4 Very trustworthy
----------------------	-----------------------	---------------	---------------------	--------------------

**Intellectual ability (IA)**

IA1: Rate how successful the individual was at school

0 Very unsuccessful	1 Quite unsuccessful	2 Indifferent	3 Quite successful	4 Very successful
---------------------	----------------------	---------------	--------------------	-------------------

IA2: How intelligent does the individual appear to be?

0 Very unintelligent	1 Quite unintelligent	2 Indifferent	3 Quite intelligent	4 Very Intelligent
----------------------	-----------------------	---------------	---------------------	--------------------

IA3: How possible was it for the individual to be successful at university?

0 Very impossible	1 Quite impossible	2 Indifferent	3 Quite possible	4 Very possible
-------------------	--------------------	---------------	------------------	-----------------

**Psychological adjustment (PA)**

PA1: How introverted or extroverted does the individual seem?

0 Very introverted	1 Quite introverted	2 Indifferent	3 Quite extroverted	4 Very extroverted
--------------------	---------------------	---------------	---------------------	--------------------

PA2: How happy does the individual appear to be?

0 Very unhappy	1 Quite unhappy	2 Indifferent	3 Quite happy	4 Very happy
----------------	-----------------	---------------	---------------	--------------

PA3: How self-confident is the individual?

0 Not at all self-confident	1 Not very self-confident	2 Indifferent	3 Quite self-confident	4 Very self-confident
-----------------------------	---------------------------	---------------	------------------------	-----------------------

**Relationship satisfaction (RS)**

RS1: How attractive is the individual?

0 Very unattractive	1 Quite unattractive	2 Indifferent	3 Quite attractive	4 Very attractive
---------------------	----------------------	---------------	--------------------	-------------------

RS2: How sexually fulfilled is the individual?

0 Very unfulfilled	1 Quite unfulfilled	2 Indifferent	3 Quite fulfilled	4 Very fulfilled
--------------------	---------------------	---------------	-------------------	------------------

RS3: How likely is the individual to be in a relationship?

0 Very unlikely	1 Quite unlikely	2 Indifferent	3 Quite likely	4 Very likely
-----------------	------------------	---------------	----------------	---------------