

## Watch-wearing as a marker of conscientiousness

David A Ellis, Rob Jenkins

Several aspects of an individual's appearance have been shown to predict personality and related behaviour. While some of these cues are grounded in biology (e.g. the human face), other aspects of a person's appearance can be actively controlled (e.g. clothing). In this paper, we consider a common fashion accessory, the wristwatch. In an exploratory sample ( $N > 100$ ) and a confirmatory sample ( $N > 600$ ), we compared big-five personality traits between individuals who *do* or *do not* regularly wear a standard wristwatch. Significantly higher levels of conscientiousness were observed in participants who wore a watch. In a third study ( $N = 85$ ), watch wearers arrived significantly earlier to appointments in comparison to controls. These results are discussed in relation to enclothed cognition and the rise of wearable technology including smartwatches.

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**Abstract**

16 Several aspects of an individual's appearance have been shown to predict personality and related  
17 behaviour. While some of these cues are grounded in biology (e.g. the human face), other aspects  
18 of a person's appearance can be actively controlled (e.g. clothing). In this paper, we consider a  
19 common fashion accessory, the wristwatch. In an exploratory sample (N>100) and a  
20 confirmatory sample (N>600), we compared big-five personality traits between individuals who  
21 *do* or *do not* regularly wear a standard wristwatch. Significantly higher levels of  
22 conscientiousness were observed in participants who wore a watch. In a third study (N=85),  
23 watch wearers arrived significantly earlier to appointments in comparison to controls. These  
24 results are discussed in relation to encloded cognition and the rise of wearable technology  
25 including smartwatches.

**26 1. Introduction**

27 The ability to perceive, and generalize from variations in behaviour or appearance helps provide  
28 a sense of order and predictability in social interactions (Ambady & Skowronski 2008). and  
29 observers routinely make rapid inferences about personality based on aspects of personal  
30 appearance across a variety of contexts (Wall, Taylor, Dixon, Conchie & Ellis 2013). Inferences  
31 are often based on information revealed through cues from the face, body, or voice. For example,  
32 aspects of personality extracted from brief snippets of novel voices are remarkably consistent  
33 between participants (McAleer, Todorov & Belin 2014). Similarly, people with broad faces are  
34 rated as more aggressive (Carré & McCormick 2008). For some traits, there appears to be a  
35 strong biological basis that explains any behavioural correlate - testosterone affects facial  
36 appearance and aggression for example (Verdonch, Gaethofs, Carels & de Zegher 1999).  
37 However, a second related branch of research concerns other aspects of an individuals'  
38 appearance that can actively be controlled and a variety of specific inferential links have been  
39 observed between particular 'features' of clothing and components of character. Participants who  
40 wear glasses were rated as less extraverted and less open to experience (Borkenau 1991;  
41 Hellstorm & Tekle 2006) while the presence of tattoos are associated with lower levels of  
42 conscientious and higher levels of extraversion (Swami 2012).

43

44 This line of research also raises the question of how reliable these inferences are in terms of  
45 predicting behaviour. The fact that these facets of appearance are chosen by the individual rather  
46 than being biologically endowed may suggest a weaker link between appearance and behaviour,  
47 but a growing body of research on the phenomenon of 'enclothed cognition', where changes in  
48 clothing can also effect behaviour challenge this assumption. Adam & Galinsky (2012) recently

49 demonstrated that wearing a lab coat described as a ‘doctor’s coat’ increased sustained attention  
50 when compared to wearing a lab coat that was labeled as a ‘painter’s coat’. They argue that  
51 ‘enclothed cognition’ depends on both the symbolic meaning and the physical experience of  
52 wearing clothes. In addition, effects running in the opposite direction (from personality to  
53 appearance) may be more plausible for non-biological factors. An aggressive person for instance  
54 cannot chose to have a broader face, but he could choose to wear black clothes and make  
55 themselves appear more aggressive (Vrij 1997). Here we focus on one particular clothing  
56 accessory, the wristwatch. Watches are an interesting case because they are designed to perform  
57 a very specific function – to tell the time. This specificity of function lends itself to  
58 experimentation because it suggests very targeted predictions about personality and behaviour.

59

60 Despite the rise in mobile devices with built-in clocks, the number of standard watch owners has  
61 remained static in recent years (Hoffman 2009; Mintel 2010). On the other hand, while many  
62 people continue to regularly wear a wristwatch, many chose to avoid them completely. Their  
63 prominence or absence in everyday life again makes them an ideal candidate when considering  
64 external markers of personality.

65

66 While research concerning the relationship between personality and an individual’s outward  
67 appearance appears to be flourishing (e.g. Hellstrom & Tekle 2006; Gillath, Bahns, Ge &  
68 Crandall 2012; Swami 2012), a number of limitations continue to affect this literature. First,  
69 there remains an over-reliance on university student samples. These samples may not be  
70 representative of the wider population (Swami 2012). Secondly, previous research often fails to  
71 go beyond self-report (e.g. Gillath etl al 2012), with many papers failing to include an additional

72 behavioural measure that may help explain or confirm differences observed in personality scores  
73 alone.

74 In order to overcome these limitations, and based on the premise that a core component of  
75 Conscientiousness is good timekeeping, planning (Back, Schmukle & Egloff 2006), and  
76 organisation (Lee & Ashton 2004), we predicted that watch wearers would score consistently  
77 higher on a simple measure of conscientiousness in comparison to non-watch wearers.

78 Accordingly, timekeeping can be operationalised as punctuality and if watch wearers really are  
79 more conscientious then they will, in turn, be more punctual in a real-life setting.

80

## 81 **2. Study 1**

82

### 83 *Ethics Statement*

84 The University of Glasgow, College of Science & Engineering Ethics Committee approved all  
85 research (2013-4641). Participants were informed about procedures in detail and provided  
86 written informed consent.

87

### 88 *2.1. Method*

#### 89 *2.1.1. Measures*

90 We assessed personality using The Ten-Item Personality Inventory (TIPI). The TIPI was  
91 developed by Gosling, Rentfrow and Swann (2003) to meet the need for a very brief measure of  
92 the Big-Five personality dimensions (extraversion, agreeableness, conscientiousness, emotional  
93 stability and openness to experience). This measure was chosen due to its short nature, which

94 allowed us to collect comparable data from both members of the public and students who had a  
95 limited amount of time to take part.

### 96 *2.1.2 Participants*

97 One hundred and twelve participants were recruited and included members of the public  
98 attending The British Science Festival in 2010 and students studying psychology at Glasgow or  
99 Lincoln Universities in the United Kingdom (62.5% female) who were waiting to take part in  
100 experiments. Their ages ranged from 17-54.

### 101 *2.1.3 Procedure*

102 Individuals approaching a psychology stand were asked if they wished to take part in a short  
103 study related to personality. If written consent was obtained, participants were required to fill out  
104 the TIPI. They were then asked whether or not they regularly wore a wristwatch. A regular watch  
105 wearer was defined as someone who wore a standard wristwatch, most of the time, for at least a  
106 year. Finally, all participants were thanked for their time and fully debriefed as to the true nature  
107 of the study.

### 108 *2.1.4. Results*

109 As expected, participants who identified themselves as regular watch wearers rated themselves  
110 as significantly more conscientious when compared with controls (Table I). We also observed  
111 that watch wearers scored lower in extraversion, agreeableness and openness, but higher on  
112 emotional stability. However, before conducting a further multivariate analysis, we next sought  
113 to replicate this finding in a larger confirmatory sample.

114 ---Insert Table I about here---

115

116

### 117 3. Study 2

118 We attempted to replicate the results from Study 1 in a large online sample who, after  
119 completing the TIPI were asked:

120 *'Do you regularly wear a watch?'*

121 Participants were recruited via numerous email shots and twitter advertisements. They also  
122 provided information about their age, gender, location, working habits and mobile phone  
123 ownership. In total, 638 participants took part (48.6% female). Modal age bands were 35-54  
124 (36.4%) and 18-24 (30.5%); modal locations UK (60.8%), North America (13%). Regarding  
125 working habits, 49.7% confirmed that they worked a traditional Monday-Friday dayshift with the  
126 remainder working alternative hours (e.g. shifts, unemployed or students). Finally, 46% percent  
127 (N=290) identified themselves as being regular watch wearers.

#### 128 3.1 Preliminary Analysis

129 A primary analysis revealed no significant difference in the distribution of genders between the  
130 watch and non-watch groups [ $X^2(1, N=632) = 2.36, p = .124$ ]. While 97.48% of our sample  
131 owned a mobile phone, we also observed that there was no significant difference in this  
132 distribution of phone ownership between watch and non-watch wearers [ $X^2(1, N=635) = .803, p$   
133  $= .370$ ]. Finally, there was no significant difference in the distribution of those who worked  
134 traditional or shift based work between watch and non-watch groups [ $X^2(1, N=637) = .680, p =$   
135  $.410$ ].

#### 136 3.2 Replication of Study 1

137 An independent sample t-test again revealed significant differences in mean conscientiousness  
138 scores between watch and non-watch wearers (Table II). Further t-tests revealed no other  
139 significant personality differences between watch and non-watch wearers across the other four  
140 factors of personality [ $p$ 's > .05]. As observed in Study 1 however, we again observed similar  
141 trends whereby watch wearers scored lower in extraversion and openness in comparison to  
142 controls.

143

144 ---Insert Table II about here---

145

### 146 *3.3 Regression Model*

147 In order to confirm that the personality differences reported above hold after controlling for  
148 additional factors, we entered age, gender and all five personality factors into a binary logistic  
149 model. This model confirms that wearing a watch remains a visible indicator for  
150 conscientiousness even after controlling for gender and age (Table III). In other words, the odds  
151 of wearing a watch is significantly larger for a person who reports higher levels of  
152 conscientiousness (odds ratio = 1.147).

153

154 ---Insert Table III about here---

155

## 156 **4. Multivariate analysis**

157 Personality is a multidimensional construct and effect sizes should also be considered in relation  
158 to the overall magnitude of differences observed between two groups. When groups differ along



159 several variables at once, the overall between-group difference is not always accurately  
160 represented by *univariate* effect sizes in isolation. Therefore, Del Giudice, Booth & Irwing  
161 (2012) have argued that in order to aggregate differences across variables while also taking  
162 correlation patterns into account, it is necessary to computer a *multivariate* effect size. The  
163 Mahalanobis distance  $D$  metric allows for these comparisons and is given by the formula:

164

$$165 \quad D = \sqrt{\mathbf{d}'\mathbf{S}^{-1}\mathbf{d}}$$

166

167 where  $\mathbf{d}$  is the vector of univariate standardised differences (Cohen's  $d$ ) and  $\mathbf{S}$  is the correlation  
168 matrix.

169

170 We calculated the multivariate generalisation ( $D$  measure) of personality differences in both  
171 samples, factoring in changes between the groups across all five factors of personality. When  
172 evaluated in this way, personality differences observed in both samples are considerably larger  
173 than some of the Cohen's  $d$  effect sizes in isolation. The resulting multivariate effect sizes were  
174 calculated as  $D = .69$  in the exploratory sample and  $D = .23$  in the confirmatory sample. While  
175 significant differences were observed in levels of conscientiousness between the two groups, the  
176 overall differences in personality are not limited to a single personality factor. For example, in  
177 both samples watch wearers consistently produce lower extraversion and openness to experience  
178 scores.

179

180 **5. Study 3**

181 The previous results lend strong support to the notion that people who choose to wear a watch  
182 also tend to rate themselves as more conscientious. While organisation is often considered as a  
183 lower-order facet score in many personality measures (e.g. as part of the HEXACO Personality  
184 Inventory; Lee & Ashton 2004), higher levels of conscientiousness alone correlate with  
185 improved punctuality (Back et al 2006). Ashton (1998) also observed that conscientiousness was  
186 negatively associated with self-reported lateness in the workplace. Our final study therefore  
187 sought to investigate if punctuality is also related to watch wearing.

## 188 *5.1. Method*

### 189 *5.1.1 Participants*

190 Ninety participants (29% male) who arrived to complete a separate experiment in the School of  
191 Psychology took part in this study. Their ages ranged from 17 to 48. All participants had  
192 previously visited the department on at least one previous occasion. This ensured that  
193 participant's were unlikely to become lost before an experiment was scheduled to start.

### 194 *5.1.2 Procedure*

195 Participants arriving at the School of Psychology for an unrelated experiment had their exact  
196 time of arrival recorded by the experimenter. Time of arrival was recorded as time-lag in minutes  
197 between the experiment appointment time and time of each participant's arrival. It was also  
198 noted whether they were a regular watch wearer.

### 199 *5.1.3. Results*

200 Participants who exceeded an early or late arrival time of +/- 15 minutes were removed from the  
201 analysis (N=5) to ensure that data were normally distributed. On average, the remaining  
202 participants arrived 2.19 minutes before the appointed time ( $SD = 5.95$ ). Mean punctuality scores

203 (minutes late or early) were calculated for watch and non-watch wearers. A total of 34 watch  
204 wearers and 51 non-watch wearers arrival times were analysed (Fig I).

205

206 ---Insert Figure I about here---

207

208 An independent sample t-test demonstrated a reliable difference in punctuality with participants  
209 in the watch-wearing group arriving significantly earlier [ $M = 4.12$ ,  $SD = 5.45$ ] in comparison to  
210 those who were not wearing a watch [ $M = .90$ ,  $SD = 5.96$ ], [ $t(83) = 2.52$ ,  $p = .01$ ;  $d = .55$ ].

211

## 212 **6. General Discussion**

213 Choosing to wear a watch appears to act as a social marker for an individual who is likely to be  
214 more conscientious. A further replication across a larger sample supports this conclusion. We  
215 also observed consistent multivariate differences in personality between the two groups with  
216 watch wearers showing lower levels of extraversion and openness. Finally, watch wearers  
217 behave in way that is consistent with higher levels of conscientiousness by arriving at an  
218 appointment earlier than non-watch wearers.

219

220 While personality has previously been linked to time perception (e.g. Rammsayer 1997), this is  
221 the first study to link personality with the absence or presence of an everyday time cue. Higher  
222 levels of conscientiousness have previously been associated with increased levels of self-  
223 organisation in a variety of contexts and watch wearing may be an additional purchase decision  
224 that interacts with other related individual differences (Aaker 1997). Conscientiousness alone is

225 made up of many sub-facets of personality and one of these may play a more important role in  
226 watch wearing than others (e.g. organisation, diligence and perfectionism; Lee & Ashton 2004).

227

228 These results could also be considered in the context of enclothed cognition, that is, the influence  
229 clothes or fashion accessories can have on a wearer's psychological processes. Adam & Galinsky  
230 (2012) propose that changes in cognition depend on both the symbolic meaning and physical  
231 experience of wearing different types of clothes, but this could also apply to wristwatches. As a  
232 fashion accessory, or expression of social status the act of wearing a watch may provide an  
233 additional, albeit implicit cognitive impact on wearers, which makes them more conscientious  
234 and better planners. In terms of punctuality specifically, appointment type may be an important  
235 factor to consider in future research, but these results are consistent with research demonstrating  
236 that personality is likely to be important when considering punctuality in isolation (Back et al  
237 2006). Even if conscientious individuals are delayed, they will be dutiful enough to try to limit  
238 their lateness. In addition, our effect size relating to punctuality is far higher than previous  
239 correlations observed between conscientiousness and punctuality in a comparable sample by  
240 Back and colleagues (2006).

241

242 The standard watch remains technologically simple, but this simplicity explains why countless  
243 manufactures of smartwatches are attempting to capitalize on this specific form factor (Fogg  
244 2009). Such devices typically measure and provide additional feedback related to physical and  
245 physiological activity (e.g. heart rate). Interestingly, these devices are more likely to be  
246 purchased by those who already lead a healthy lifestyle (Swan 2009). The desire to own or wear

247 a standard wristwatch may therefore be driven by higher levels of conscientiousness in the first  
248 instance. Alternatively, the decision to purchase a watch may simply be motivated by a desire to  
249 know the time, become more organised and in turn attempt to become more conscientious.

250

251 Could the act of wearing a watch make an individual healthier or more conscientious? At  
252 present, this line of enquiry only extends to more simplistic devices like pedometers, where  
253 feedback correlates with an increase in physical activity, but not beyond the duration of the  
254 original intervention (Bravata et al 2007). While watch wearing and smartwatch ownership  
255 correlate with increased levels of conscientiousness and health promoting behaviours, the  
256 direction of these relationships remains unclear, but worthy of further investigation. This is  
257 particularly relevant given existing links between the accuracy of clocks and long-term health  
258 outcomes (Levine & Bartlett 1984; Levine & Norenzayan 1999).

259

260 Another future direction for this research would be to explore the effect that watch wearing can  
261 have on first impressions and consider the relationship between self and others' perceptions of  
262 watch wearing. How such a time cue could influence other evaluative judgments by prompting  
263 attributions remains unclear. One might predict that the presence of a watch would serve to help  
264 improve an individual's first impression in a specific social context for example, at a job  
265 interview (Chaplin, Phillips, Brown, Clanton & Stein 2000; Dougherty, Turban & Callender  
266 1994).

267

268 One limitation which could be levelled at this study is that some participants may own a mobile  
269 phone, but not a standard watch, which may act as a confounder because they still have rapid  
270 access to the time. However, 100% of our exploratory sample and 97.48% in our second sample  
271 also owned a mobile phone so this is unlikely to have been an influencing factor. It is worth  
272 noting however, that the effect size relating to differences in conscientiousness reduced  
273 considerably between our exploratory and confirmatory samples. While the effect size is reduced  
274 in our larger sample, small effects could have larger aggregated consequences. For example, the  
275 short nature of the personality measure chosen suggests that a larger effect may be observed if a  
276 more in-depth measure of personality was deployed, but this may have limited our sample size.  
277 For now, we simply wanted to demonstrate that our exploratory findings could be replicated in a  
278 further independent sample using an identical measure of personality.

279

280 A second limitation concerns the reasons behind watch ownership. While an alternative  
281 explanation might conclude that choosing to wear a watch is related to social status and not a  
282 desire to know the time, this argument does not chime with the consistency of our results  
283 reported here. This is particularly pertinent when considered alongside our behavioural measure  
284 however, we cannot rule this additional explanation out completely.

285

286 In sum, wearing a device that tells the time on the wrist is likely to remain an important tool for  
287 the foreseeable future and to our knowledge this is the first study to demonstrate a link between  
288 watch wearing, personality and related behaviour (Anwar 2012). Specifically, watch wearers  
289 from a variety of backgrounds elicit significantly higher levels of conscientiousness and lower  
290 levels of extraversion and openness. They also arrive earlier for appointments. From the present

291 data, it is not clear whether being conscientious inclines a person to wear a watch, or whether  
292 wearing a watch makes a person more conscientious. Whichever the direction of the relationship,  
293 watch wearing is a valid external marker of both personality and associated behaviour.

294

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298

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**Table 1** (on next page)

Personality differences between watch and non-watch wearers in an exploratory sample

Note: \* =  $p < .05$ . Standard Deviations appear in parenthesis alongside means.

1

2 Table I. Personality differences between watch and non-watch wearers in an exploratory sample

Exploratory Sample N=112

	$\alpha$	Watch		$t$	$d$
		yes n=53	no n=59		
Extraversion	.48	4.53 (1.17)	4.69 (1.30)	.67	-.13
Agreeableness	.13	4.49 (1.32)	4.73 (.88)	1.13	-.22
Conscientiousness	.63	5.35 (1.54)	4.31 (1.24)	3.94*	.75
Emotional Stability	.45	4.65 (1.31)	4.57 (1.21)	.35	.07
Openness to Experiences	.39	5.18 (1.26)	5.46 (.98)	1.31	-.25

3 Note: \* =  $p < .05$ . Standard Deviations appear in parenthesis alongside means.

4

5

**Table 2** (on next page)

Personality differences between watch and non-watch wearers in a confirmatory sample

\*\*The TIPI was intentionally designed to produce low coefficient alphas, which are themselves misleading when calculated on scales with a reduced number of items (Kline 2000; Wood & Hampson 2005). Our reported values compare favorably to the internal measures of consistency observed by Gosling et al (2003) during the scales initial development.

1 Table II. Personality differences between watch and non-watch wearers in a confirmatory sample

Confirmatory Sample N=638

	$\alpha^{**}$	Watch		<i>t</i>	<i>d</i>
		yes n=290	no n=348		
Extraversion	.77	3.83 (1.57)	3.90 (1.60)	.55	-.04
Agreeableness	.36	4.71 (1.20)	4.64 (1.22)	.80	.06
Conscientiousness	.58	4.81 (1.39)	4.56 (1.37)	2.21*	.18
Emotional Stability	.66	4.53 (1.48)	4.57 (1.46)	.33	-.03
Openness to Experiences	.41	5.14 (1.15)	5.32 (1.15)	1.89	-.01

2 Notes. \* =  $p < .05$ . Standard Deviations appear in parenthesis alongside means.

3 \*\*The TIPI was intentionally designed to produce low coefficient alphas, which are themselves  
 4 misleading when calculated on scales with a reduced number of items (Kline 2000; Wood &  
 5 Hampson 2005). Our reported values compare favorably to the internal measures of consistency  
 6 observed by Gosling et al (2003) during the scales initial development.

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**Table 3**(on next page)

Results from a binary logistic model [ $X^2$  (9, N=617\*) = 20.51,  $p = .015$ ]. This controls for a number of other variables that may also predict watch wearing.

Notes: \*N=617 (22 participants from the original sample did not confirm their age and/or gender). \*\*Significant p-values are highlighted in bold.

1 Table III. Results from a binary logistic model [ $X^2(9, N=617^*) = 20.51, p = .015$ ]. This controls  
 2 for a number of other variables that may also predict watch wearing.

Variables	$\beta$	S.E.	Wald	Sig**	Exp ( $\beta$ )
<b>Gender</b>	.243	.182	1.781	.182	1.276
<b>Age</b>					
18-24			9.254	<b>.026</b>	
25-34	-.348	.221	2.479	.115	.706
35-49	.184	.204	.818	.366	1.203
55+	.617	.409	2.269	.132	1.853
<b>Personality</b>					
Extraversion	.000	.056	.000	.999	1.000
Agreeableness	.022	.072	.093	.760	1.022
Conscientiousness	.137	.062	4.837	<b>.028</b>	1.147
Emotional Stability	.004	.062	.005	.944	1.004
Openness to Experiences	-.113	.076	2.210	.137	.893

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5 Notes:

6 \*N=617 (22 participants from the original sample did not confirm their age and/or gender).

7 \*\*Significant p-values are highlighted in bold.

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## 1

Differences in arrival times between watch and non-watch wearers.

