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Wristwatches predict personality and punctuality

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In exploratory (N>100) and confirmatory samples (N>600), we compared big-five personality traits between individuals who do or do not regularly wear a traditional wristwatch. Alongside lower levels of extraversion and openness, significantly higher levels of conscientiousness were observed in participants who wear a watch. In a third study (N=85), we observed that watch wearers arrive significantly earlier to appointments in comparison to controls. These results are discussed in relation to the rise of wearable technology including smartwatches.

2 **Wristwatches predict personality and punctuality**

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18 **Abstract**

19 In exploratory (N>100) and confirmatory samples (N>600), we compared big-five personality traits
20 between individuals who do or do not regularly wear a traditional wristwatch. Alongside lower levels
21 of extraversion and openness, significantly higher levels of conscientiousness were observed in
22 participants who wear a watch. In a third study (N=85), we observed that watch wearers arrive
23 significantly earlier to appointments in comparison to controls. These results are discussed in relation
24 to the rise of wearable technology including smartwatches.

25 **Keywords: time, appearance, personality, conscientiousness, punctuality**

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27

28 **1. Introduction**

29 An array of individual differences interact with our experience of time. People with a greater capacity
30 for attention and engagement (Block & Zakay 1997), novelty (Danckert & Allman 2005), impulsivity
31 (Van den Broek, Bradshaw & Szadadi 1992), all perceive time as passing more quickly than others.

32 Personality factors have also been linked to duration perception with mixed results. While
33 overestimation has previously been shown to correlate with increased levels of extraversion
34 (Rammsayer 1997; Zakay, Lomranz & Kaziniz 1984) and emotional stability (Kirkcaldy 1984), recent
35 experiments have found no linear relationship between personality scores and timing performance
36 (Rammsayer & Rammstedt 2000). While current links between time and personality are somewhat
37 contradictory, there remain distinct situational influences on temporal experience that are likely to
38 interact with other individual differences. These influences range from the speeding effects of body
39 temperature, alcohol and caffeine (Terry, Dumas, Desai & Wing 2009; Wearden & Penton-Voak
40 1995) to the perceived slowing effects of social rejection (Twenge, Catanese & Baumeister 2003).

41

42 Psychologically, the feeling of time being distorted prompts people to seek an explanation (Sackett,
43 Meyvis, Nelson, Converse, & Sackett 2012). While the factors outlined above shed some light on the
44 psychological influences that govern time perception, they do attempt to explore individual differences
45 that may interact with the choices people make when choosing to be closer or further away from the
46 actual passing of time itself. This is surprising given that time cues have previously shown themselves
47 to be of great importance across experimental and real-life contexts. For example, Sackett and
48 colleagues (2012) conducted a series of experiments that manipulated a digital clock where time
49 appeared to move slightly faster or slower in comparison to real time. When people believed that time
50 had passed unexpectedly quickly, they rated tasks as more engaging, noises as less irritating and songs

51 as more enjoyable. Similarly, Levine and Bartlett (1984) observed that national clock accuracy was
52 positively associated with increased walking and work speed.

53

54 One everyday example of a common time cue is the traditional wristwatch. This alone may be an
55 additional purchase decision that interacts with other relevant individual differences and associated
56 behaviours (Aaker 1997). Despite an exponential increase in the number of clocks that surround us and
57 the growth of portable digital products in the 21st century, including smartwatches, the number of
58 traditional watch owners has remained static (Hoffman 2009; Mintel 2010). On the other hand, while
59 many people continue to regularly wear a wristwatch, many chose to avoid them completely. Their
60 prominence or absence in everyday life therefore makes them an ideal candidate when considering
61 external markers of personality.

62

63 While research concerning the relationship between personality and an individual's outward
64 appearance appears to be flourishing (e.g. Hellstrom & Tekle 2006; Gillath, Bahns, Ge & Crandall
65 2012; Swami 2012), a number of limitations continue to affect this literature. First, there remains an
66 over-reliance on university student samples. These samples may not be representative of the wider
67 population (Swami 2012). Secondly, previous research often fails to go beyond self-report (e.g. Gillath
68 et al 2012), with many papers failing to include an additional behavioral measure that may help explain
69 or confirm differences observed in personality scores alone.

70

71 In order to overcome these limitations, and based on the premise that conscientiousness is associated
72 with time-keeping, planning (Back, Schmukle & Egloff 2006), and organisation (Lee & Ashton 2004),
73 we predicted that watch wearers would score consistently higher on a simple measure of

74 conscientiousness in comparison to non-watch wearers. Accordingly, if watch wearers really are more
75 conscientious then they will, in turn, be more punctual in a real-life setting

76

77 **2. Study 1**

78

79 *Ethics Statement*

80 The University of Glasgow, College of Science & Engineering Ethics Committee approved all research
81 (2013-4641). Participants were informed about procedures in detail and provided written informed
82 consent.

83

84 *2.1. Method*

85 *2.1.1. Measures*

86 We assessed personality using The Ten-Item Personality Inventory (TIPI). The TIPI was developed by
87 Gosling, Rentfrow and Swann (2003) to meet the need for a very brief measure of the Big-Five
88 personality dimensions (extraversion, agreeableness, conscientiousness, emotional stability and
89 openness to experience). This measure was chosen due to its short nature, which allowed us to collect
90 comparable data from both members of the public and students who had a limited amount of time to
91 take part.

92

93

94 *2.1.2 Participants*

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

99

100 *2.1.3 Procedure*

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

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114 *2.1.4. Results*

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

Exploratory Sample N=112

	α^{**}	Watch		<i>t</i>	<i>d</i>
		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

116 Notes: * = $p < .05$. Standard Deviations appear in parenthesis alongside means.

117 **The TIPI was intentionally designed to produce low coefficient alphas, which are themselves
 118 misleading when calculated on scales with a reduced number of items (Kline 2000; Wood & Hampson
 119 2005). They are included here for reference only.
 120

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

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132 **3. Study 2**

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

135 ‘Do you regularly wear a watch?’

136 Participants were recruited via numerous email shots and twitter advertisements. In total, 638
137 participants took part (48.6% female). Their ages ranged from 18-85. 64.15% were located in the UK,
138 with the rest based in Europe, the United States and Canada. Forty-six percent (N=290) identified
139 themselves as being regular watch wearers.

140
141 Table II. Personality differences between watch and non-watch wearers in a confirmatory sample

Confirmatory Sample N=638

	α	Watch		t	d
		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

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

143

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

149

150 4. Multivariate analysis

151 Personality is a multidimensional construct and effect sizes should also be considered in relation to the
152 overall magnitude of differences observed between two groups. Therefore, we also calculated the
153 multivariate generalisation (D measure) of personality differences in both samples (Del Giudice, Booth
154 & Irwing 2012). This factors in changes between the groups across all five factors of personality.
155 When evaluated in this way, personality differences observed in both samples are considerably larger
156 than some of the Cohen's d effect sizes in isolation. The resulting multivariate effect sizes were
157 calculated as $D = .69$ in the exploratory sample and $D = .23$ in the confirmatory sample. While
158 significant differences were observed in levels of conscientiousness between the two groups, the
159 overall differences in personality are not limited to a single personality factor. For example, in both
160 samples watch wearers consistently produce lower extraversion and openness to experience scores.

162 5. Study 3

163 The previous results lend strong support to the notion that people who choose to wear a watch also tend
164 to rate themselves as more conscientious. While organisation is often considered as a lower-order facet
165 score in many personality measures (e.g. as part of the HEXACO Personality Inventory; Lee & Ashton
166 2004), higher levels of conscientiousness alone correlate with improved punctuality (Back et al 2006).
167 Ashton (1998) also observed that conscientiousness was negatively associated with self-reported
168 lateness in the workplace. Our final study therefore sought to investigate if punctuality is also related to
169 watch wearing.

171 5.1.1 Participants

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

176

177 *5.1.2 Procedure*

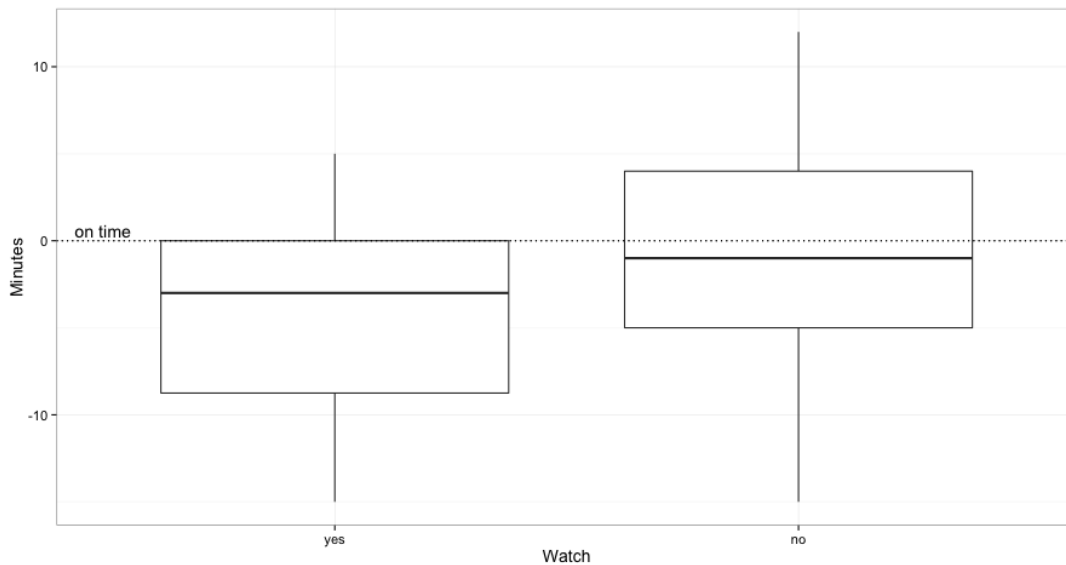
178 Participants arriving at the School of Psychology for an unrelated experiment had their exact time of
179 arrival recorded by the experimenter. Time of arrival was recorded as time-lag in minutes between the
180 experiment appointment time and time of each participant's arrival. It was also noted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

182

183 *5.1.3. Results*

184 Participants who exceeded an early or late arrival time of +/- 15 minutes were removed from the
185 analysis (N=5) to ensure that data were normally distributed. On average, the remaining participants
186 arrived 2.19 minutes before the appointed time ($SD = 5.95$). Mean punctuality scores (minutes late or
187 early) were calculated for watch and non-watch wearers. A total of 34 watch wearers and 51 non-watch
188 wearers arrival times were analysed (Fig I).

189 Figure 1: Differences in arrival times between watch and non-watch wearers.



190

191

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

195

196 6. General Discussion

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

202

203 While personality has previously been linked to time perception (e.g. Rammsayer 1997), this is the first
204 study to link personality with the absence or presence of an everyday time cue. Higher levels of
205 conscientiousness have previously been associated with increased levels of self-organisation in a
206 variety of contexts and watch wearing may be an additional purchase decision that interacts with other
207 related individual differences (Aaker 1997). Conscientiousness alone is made up of many sub-facets of
208 personality and one of these may play a more important role in watch wearing than others (e.g.
209 organisation, diligence and perfectionism; Lee & Ashton 2004). In terms of punctuality, appointment
210 type may be an important factor to consider in future research, but these results are consistent with
211 research demonstrating that personality is likely to be important when considering punctuality in
212 isolation (Back et al 2006). Even if conscientious individuals are delayed, they will be dutiful enough
213 to try to limit their lateness. In addition, our effect size relating to punctuality is far higher than
214 previous correlations observed between conscientiousness and punctuality in a comparable sample by
215 Back and colleagues (2006).

216

217 It is also interesting to consider how the wearing of a watch or the desire to know the time accurately
218 may interact with an individual's health. Levine & Bartlett (1984) observed that the accuracy of clocks
219 in a given country positively correlated with faster walking speeds and work pace. Time urgency – the
220 perpetual struggle to achieve a great many goals in a short period of time has also been associated with
221 higher rates of death, coronary heart disease, higher smoking rates and improved subjective well-being
222 (Levine & Norenzayan 1999). A complementary strand of current research therefore concerns the
223 growth and potential effectiveness of smartwatches that provide enhanced functionality beyond
224 timekeeping. Such devices typically measure and provide additional feedback related to physical and
225 physiological activity (e.g. heart rate). Interestingly, these devices are more likely to be purchased by

226 those who already lead a healthy lifestyle (Swan 2009). The desire to own or wear a traditional
227 wristwatch may therefore be driven by higher levels of conscientiousness in the first instance.
228 Alternatively, the decision to purchase a watch may simply be motivated by a desire to know the time,
229 become more organised and in turn attempt to become more conscientious.

230

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

238

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

245

246 One limitation which could be levelled at this study is that some participants may own a mobile phone,
247 but not a traditional watch, which may act as a confounder because they still have rapid access to the

248 time. However, 100% of our exploratory sample and 97.48% in our second sample also owned a
249 mobile phone so this is unlikely to have been an influencing factor. It is worth noting however, that the
250 effect size relating to differences in conscientiousness reduced considerably between our exploratory
251 and confirmatory samples. Here we observe the frequently cited 'decline effect' when small scale
252 findings are extrapolated out into larger samples (Schooler 2011). This may be caused by a simple
253 regression to the mean and the short personality measure used would support this assertion. However,
254 while the effect size is reduced in our larger sample, small effects could have larger aggregated
255 consequences. For example, the short nature of the personality measure chosen suggests that a larger
256 effect may be observed if a more in-depth measure of personality was deployed, but this may have
257 limited our sample size. For now, we simply wanted to demonstrate that our exploratory findings could
258 be replicated in a further independent sample using an identical measure of personality.

259
260 A second limitation concerns the reasons behind watch ownership. While an alternative explanation
261 might conclude that choosing to wear a watch is related to social status and not a desire to know the
262 time, this argument does not chime with the consistency of our results reported here. This is
263 particularly pertinent when considered alongside our behavioural measure however, we cannot rule this
264 additional explanation out completely.

265
266 In sum, wearing a device that tells the time on the wrist is likely to remain an important tool for the
267 foreseeable future and to our knowledge this is the first study to demonstrate a link between watch
268 wearing, personality and related behaviour (Anwar 2012). Specifically, watch wearers from a variety of
269 backgrounds elicit significantly higher levels of conscientiousness and lower levels of extraversion and
270 openness. They also arrive earlier for appointments. While the direction of this relationship remains

271 unclear, for now we show that watch wearing remains an important external marker for both
272 personality and associated behaviour.

273

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276

277

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