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Wristwatches predict personality and punctuality

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Wristwatches predict personality and punctuality

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Abstract

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.

Keywords: time, appearance, personality, conscientiousness, punctuality
1. Introduction

An array of individual differences interact with our experience of time. People with a greater capacity for attention and engagement (Block & Zakay 1997), novelty (Danckert & Allman 2005), impulsivity (Van den Broek, Bradshaw & Szadadi 1992), all perceive time as passing more quickly than others. Personality factors have also been linked to duration perception with mixed results. While overestimation has previously been shown to correlate with increased levels of extraversion (Rammsayer 1997; Zakay, Lomranz & Kaziniz 1984) and emotional stability (Kirkcaldy 1984), recent experiments have found no linear relationship between personality scores and timing performance (Rammsayer & Rammstedt 2000). While current links between time and personality are somewhat contradictory, there remain distinct situational influences on temporal experience that are likely to interact with other individual differences. These influences range from the speeding effects of body temperature, alcohol and caffeine (Terry, Doumas, Desai & Wing 2009; Wearden & Penton-Voak 1995) to the perceived slowing effects of social rejection (Twenge, Catanese & Baumeister 2003).

Psychologically, the feeling of time being distorted prompts people to seek an explanation (Sackett, Meyvis, Nelson, Converse, & Sackett 2012). While the factors outlined above shed some light on the psychological influences that govern time perception, they do attempt to explore individual differences that may interact with the choices people make when choosing to be closer or further away from the actual passing of time itself. This is surprising given that time cues have previously shown themselves to be of great importance across experimental and real-life contexts. For example, Sackett and colleagues (2012) conducted a series of experiments that manipulated a digital clock where time appeared to move slightly faster or slower in comparison to real time. When people believed that time had passed unexpectedly quickly, they rated tasks as more engaging, noises as less irritating and songs
as more enjoyable. Similarly, Levine and Bartlett (1984) observed that national clock accuracy was positively associated with increased walking and work speed.

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

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

In order to overcome these limitations, and based on the premise that conscientiousness is associated with time-keeping, planning (Back, Schmukle & Egloff 2006), and organisation (Lee & Ashton 2004), we predicted that watch wearers would score consistently higher on a simple measure of
conscientiousness in comparison to non-watch wearers. Accordingly, if watch wearers really are more conscientious then they will, in turn, be more punctual in a real-life setting.

2. Study 1

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

2.1. Method

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

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

2.1.3 Procedure

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

2.1.4 Results

Table I. Personality differences between watch and non-watch wearers in an exploratory sample
Exploratory Sample N=112

<table>
<thead>
<tr>
<th></th>
<th>Watch</th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes</td>
<td>no</td>
<td>t</td>
<td>d</td>
</tr>
<tr>
<td>Extraversion</td>
<td>α**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>N=53</td>
<td>N=59</td>
<td>.67</td>
<td>-.13</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.63</td>
<td></td>
<td>3.94*</td>
<td>.75</td>
</tr>
<tr>
<td>Emotional Stability</td>
<td>.45</td>
<td></td>
<td>.35</td>
<td>.07</td>
</tr>
<tr>
<td>Openness to Experiences</td>
<td>.39</td>
<td></td>
<td>1.31</td>
<td>-.25</td>
</tr>
<tr>
<td></td>
<td>4.53 (1.17)</td>
<td>4.69 (1.30)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.49 (1.32)</td>
<td>4.73 (.88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.35 (1.54)</td>
<td>4.31 (1.24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.65 (1.31)</td>
<td>4.57 (1.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.18 (1.26)</td>
<td>5.46 (.98)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**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). They are included here for reference only.

As expected, participants who identified themselves as regular watch wearers rated themselves as significantly more conscientious when compared with controls (Table I). We also observed that watch wearers scored lower in extraversion, agreeableness and openness, but higher on emotional stability.

However, before conducting a further multivariate analysis, we next sought to replicate this finding in a larger comformatory sample.

### 3. Study 2
We attempted to replicate the results from Study 1 in a large online sample who, after completing the TIPI were asked:

‘Do you regularly wear a watch?’

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

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

<table>
<thead>
<tr>
<th></th>
<th>Watch</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>yes N=290</td>
<td>no N=348</td>
<td>t</td>
<td>d</td>
<td></td>
</tr>
<tr>
<td>Extraversion</td>
<td>.77</td>
<td>3.83 (1.57)</td>
<td>3.90 (1.60)</td>
<td>.55</td>
<td>-.04</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>.36</td>
<td>4.71 (1.20)</td>
<td>4.64 (1.22)</td>
<td>.80</td>
<td>.06</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>.58</td>
<td>4.81 (1.39)</td>
<td>4.56 (1.37)</td>
<td>2.21*</td>
<td>.18</td>
</tr>
<tr>
<td>Emotional Stability</td>
<td>.66</td>
<td>4.53 (1.48)</td>
<td>4.57 (1.46)</td>
<td>.33</td>
<td>-.03</td>
</tr>
<tr>
<td>Openness to Experiences</td>
<td>.41</td>
<td>5.14 (1.15)</td>
<td>5.32 (1.15)</td>
<td>1.89</td>
<td>-.01</td>
</tr>
</tbody>
</table>

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

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

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

5. Study 3

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

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

5.1.2 Procedure

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

5.1.3 Results

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

Figure 1: Differences in arrival times between watch and non-watch wearers.
An independent sample t-test demonstrated a reliable difference in punctuality with participants in the watch-wearing group arriving significantly earlier \([M = 4.12, SD = 5.45]\) in comparison to those who were not wearing a watch \([M = .90, SD = 5.96]\), \([t (83) = 2.52, p = .01; d = .55]\).

6. General Discussion

Choosing to wear a watch appears to act as a social marker for an individual who is likely to be more conscientious. A further replication across a larger sample supports this conclusion. We also observed consistent multivariate differences in personality between the two groups with watch wearers showing lower levels of extraversion and openness. Finally, watch wearers behave in way that is consistent with higher levels of conscientiousness by arriving at an appointment earlier than non-watch wearers.
While personality has previously been linked to time perception (e.g. Rammsayer 1997), this is the first study to link personality with the absence or presence of an everyday time cue. Higher levels of conscientiousness have previously been associated with increased levels of self-organisation in a variety of contexts and watch wearing may be an additional purchase decision that interacts with other related individual differences (Aaker 1997). Conscientiousness alone is made up of many sub-facets of personality and one of these may play a more important role in watch wearing than others (e.g. organisation, diligence and perfectionism; Lee & Ashton 2004). In terms of punctuality, appointment type may be an important factor to consider in future research, but these results are consistent with research demonstrating that personality is likely to be important when considering punctuality in isolation (Back et al 2006). Even if conscientious individuals are delayed, they will be dutiful enough to try to limit their lateness. In addition, our effect size relating to punctuality is far higher than previous correlations observed between conscientiousness and punctuality in a comparable sample by Back and colleagues (2006).

It is also interesting to consider how the wearing of a watch or the desire to know the time accurately may interact with an individual’s health. Levine & Bartlett (1984) observed that the accuracy of clocks in a given country positively correlated with faster walking speeds and work pace. Time urgency – the perpetual struggle to achieve a great many goals in a short period of time has also been associated with higher rates of death, coronary heart disease, higher smoking rates and improved subjective well-being (Levine & Norenzayan 1999). A complementary strand of current research therefore concerns the growth and potential effectiveness of smartwatches that provide enhanced functionality beyond timekeeping. Such devices typically measure and provide additional feedback related to physical and physiological activity (e.g. heart rate). Interestingly, these devices are more likely to be purchased by
those who already lead a healthy lifestyle (Swan 2009). The desire to own or wear a traditional wristwatch may therefore be driven by higher levels of conscientiousness in the first instance. Alternatively, the decision to purchase a watch may simply be motivated by a desire to know the time, become more organised and in turn attempt to become more conscientious.

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

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

One limitation which could be levelled at this study is that some participants may own a mobile phone, but not a traditional watch, which may act as a confounder because they still have rapid access to the
time. However, 100% of our exploratory sample and 97.48% in our second sample also owned a mobile phone so this is unlikely to have been an influencing factor. It is worth noting however, that the effect size relating to differences in conscientiousness reduced considerbaly between our exploratory and confirmatory samples. Here we observe the frequently cited ‘decline effect’ when small scale findings are extrapolated out into larger samples (Schooler 2011). This may be caused by a simple regression to the mean and the short personality measure used would support this assertion. However, while the effect size is reduced in our larger sample, small effects could have larger aggregated consequences. For example, the short nature of the personality measure chosen suggests that a larger effect may be observed if a more in-depth measure of personality was deployed, but this may have limited our sample size. For now, we simply wanted to demonstrate that our exploratory findings could be replicated in a further independent sample using an identical measure of personality.

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

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

Acknowledgments

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References


coordination, and time perception after the administration of alcohol or caffeine. *Psychopharmacology*. 202(4), 719-729. doi: 10.1007/s00213-008-1352-z


