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Rating e-mail personality at zero acquaintance

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Abstract

Electronic media are pervasive in daily communication. But how well do personality ratings of short e-mail messages match the self-reports of the authors? Here we describe a small-scale preliminary study to test this. Working independently and under experimenter supervision, 30 judges each rated 18 short e-mail texts. These texts were written under experimental conditions by authors of known personality, who briefly described their recent activities, and were collected as part of a previous study, which demonstrated linguistic projection of personality. Even with minimal textual cues there is relatively high agreement for ratings of Extraversion, with lesser agreement for Psychoticism. However, agreement for Neuroticism ratings, especially between target and judges, appears to be further reduced by the environment. In addition to demonstrating agreement in asynchronous—rather than *synchronous*—computer-mediated communication, this study adopts the three-factor model of personality and uses exemplar-based and subjective measures of personality perception. We note the need for further research.

Keywords: Personality perception; Language; Computer-mediated communication; Subjective measures

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1. Introduction

When we express ourselves through language, how much can others tell about our personality? What happens when we express ourselves via computer-mediated communication (CMC), and e-mail in particular? Given e-mail's popularity, this is a timely question.

In face-to-face interaction we are highly effective at judging personality (e.g., Funder & Colvin, 1988; Funder & Dobroth, 1987; Paunonen, 1989). But with only reduced behavioural cues to go on, the situation changes (Ambady, LaPlante, & Johnson, 2001; Blackman, 2002; Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004; Gosling, Ko, Mannarelli, & Morris, 2002; Hancock & Dunham, 2001; Markey & Wells, 2002). In particular, synchronous CMC, such as internet chat, is already known to make some personality judgements less confident or accurate (Hancock & Dunham, 2001; Markey & Wells, 2002), and effects have also been found with personal websites, a form of asynchronous CMC (Vazire & Gosling, 2004).

Here we focus on asynchronous e-mail, and we use Eysenck's three-factor model of personality (EPQ-R, Eysenck & Eysenck, 1991) with its dimensions of Extraversion, Neuroticism and Psychoticism. Where relevant, we discuss connections to five-factor models (Costa & McCrae, 1992; Digman, 1990), and their dimensions of Extraversion, Neuroticism, Conscientiousness, Agreeableness and Openness.

2. Background

Before discussing personality perception and the effects of CMC, we sketch some objective features of e-mail, as it relates to a communicator's personality.

2.1. Communicator personality and CMC

Outside of CMC, communicator personality and general language use are known to be linked, influencing syntax and lexical choice, as well as voice (e.g. Dewaele, 2001; Furnham, 1990; Pennebaker & King, 1999; Scherer, 1979).

CMC—specifically e-mail—is considered intermediate in form between speech and writing (Baron, 1998): It is written, with interlocutors physically separated; it is durable, and often utilises complex syntactic constructions. However, it is often unedited, makes extensive use of first and second person pronouns, present tense and contractions, and is informal. Colley and Todd (2002) identify stylistic 'emailisms', including ellipses, capitalisation, extensive use of exclamation marks and question marks.

Multi-dimensional linguistic analysis of a bulletin board corpus found that the genre resembled that of 'interviews and letters' (Collot & Belmore, 1996); an e-mail corpus has been found to be intermediate in formality, between 'personal letters' and 'scripted speeches' (Nowson, Oberlander, & Gill, 2005). Other work on the same corpus confirmed the persistence of general personality-related patterns in syntax and lexis, and revealed links between personality and emailisms (Gill & Oberlander, 2002).

2.2. Perception of personality

Personality judgements can be derived from self-report, or the perceptions of family, friends or strangers. Funder's Realistic Accuracy Model (1995) grounds the processes of accurate personality judgement in terms of the quality of the 'judge', 'target', 'trait', and 'information'. Kenny's Weighted Average Model (1994) is more elaborate, but includes parameters which are not directly relevant to the normal reception of e-mail. Thus, we here discuss relevant literature in terms of Funder's model.

Good judges are distinguished from bad by their more effective use of the cues available to them. It has been found that in at least some domains, judges with more communication experience, such as Extraverts, are better judges of personality (Akert & Panter, 1988). However, we acknowledge that the picture is more complicated than this, across situations and rating different traits.

Good targets are those whose behaviour makes available numerous and informative clues to their personality. More expressive targets exhibit more potential clues about their personality, and these in turn can inform personality perceptions (e.g. Borkenau & Liebler, 1992). Additionally Kenny notes the issue of consistency of target behaviour in personality judgement, although he acknowledges that most judges appear able to take this into account (Kenny, 1994).

Good traits are highly visible, and demonstrate low evaluativeness. Funder notes that Extraversion is highly visible and revealed by 'frequent positive social interaction' (Funder & Colvin, 1988; Funder & Dobroth, 1987; Paunonen, 1989), but relatively low in evaluativeness, or affective charge. However, Neuroticism is lower in visibility, or at least harder to make visible in experimental settings (e.g. worrying thoughts or feelings), and more evaluative. This may lead to: the concealment of undesirable behaviour from observers; a distortion of self-perception, leading to lower target-judge agreement; or a greater reluctance to judge such behaviours, resulting in reduced inter-judge agreement. When less evaluative measures of Neuroticism are used, agreement increases (John & Robbins, 1993).

In judgements by close acquaintances, much greater agreement is found for ratings of Extraversion than for Neuroticism in both the EPQ, and in five factor models. For the EPQ, Psychoticism has shown marginally lower agreement than Neuroticism (Goma-i-Freixanet, 1997). For the five-factor model, Openness generally shows similar levels of agreement to Extraversion, whereas Agreeableness shows low agreement similar to that of Neuroticism; Conscientiousness is located somewhere between these groups (e.g. McCrae & Costa, 1987). In different environments, for example rating personality on the basis of websites or bedrooms, other dimensions such as Openness to Experience may show greater agreement (Vazire & Gosling, 2004).

Good information about targets depends upon both quantity and relevance, and influences the judges' levels of agreement. Close acquaintances agree better with each other and with the target, than do other peers, or relative strangers (Funder & Colvin, 1988; Paunonen, 1989). When the amount of information for personality judgements is reduced, accuracy falls too. At zero-acquaintance, strangers rating personality using minimal cues (linguistic or visual) show greater agreement for more visible traits such as Extraversion or Conscientiousness (Albright, Kenny, & Malloy, 1988; Gifford & Hine, 1994).

More recent work has shown that zero-acquaintance judgements are particularly vulnerable to technological artifacts. For example, interviews conducted by telephone result in reduced self-

interviewer and peer-interviewer agreement than face-to-face interviews (Blackman, 2002). Impressions of personality following task-oriented synchronous CMC have been found to be less detailed but more intense compared with face-to-face communication. Judges seemed less able to rate their partners for Extraversion, Neuroticism, and Agreeableness (Hancock & Dunham, 2001). Following one-on-one interaction in an internet chat room, judges agreed over a target's Extraversion, Agreeableness, and Openness, but target-judge agreement was only found for Extraversion and Openness (Markey & Wells, 2002). In asynchronous CMC, the rating of personal websites showed Openness to have the best target-judge agreement (Vazire & Gosling, 2004).

In other situations where residues of behaviour have been used in the rating of personality, such as offices and bedrooms, ratings of Openness by naive judges agreed strongly with self- and acquaintance-reports; and in the case of bedrooms, Neuroticism ratings did too (Gosling et al., 2002). However, using 'thin slices' of videotaped behaviour to build up an impression of someone (Ambady et al., 2001), Borkenau et al. (2004) found that correlating both self- and acquaintance-reports with those of judges revealed greatest agreement for Extraversion, followed by Openness, with Neuroticism showing lower agreement.

2.3. Hypotheses

Although Openness has attracted recent attention, the fate of Neuroticism remains of interest, given that some CMC seems to make it harder to judge, but other behaviours appear to reveal it. In what follows, we exploit Eysenck's EPQ-R, since it gives robust, externally validated measures of both Extraversion and Neuroticism (Kline, 1993), and it also permits direct comparison with Goma-i-Freixanet (1997), one of the few studies to consider Psychoticism. We set out to test these hypotheses:

Trait: Extraversion will be the most easily perceived trait, due to its high visibility and low evaluativeness. So it will show the highest levels of agreement in CMC at zero-acquaintance. In comparison, both Neuroticism and Psychoticism will show reduced agreement, due to their higher evaluativeness, and lower visibility.

Information: Compared to face-to-face, agreement on Neuroticism and Psychoticism in CMC will be lower, but the two dimensions will be comparable with one another. Taking Goma-i-Freixanet's results as a starting point, this would imply that the effects of CMC on the two dimensions are similar.

We will also check for judge effects and interaction effects, between target and judge personalities; and it will be interesting to find out whether the EPQ's lack of an Openness measure is compensated by significant findings concerning Psychoticism.

3. Method

3.1. Judges

The 30 judges were undergraduate or postgraduate students, or recent graduates currently living in Edinburgh (15 males, 15 females; mean age = 21.6 years, SD = 1.24). All were experienced e-mail users (on a scale of 1–10, with 10 being 'a great deal'; mean = 9.23, SD = 0.77),

and all were naive raters of personality (18 had no experience of psychology; 12 had 'some' experience—having read books on it, or studied it as part of their degree). None had previously taken part in any personality rating experiments.

3.2. Materials

The rating booklet sections were similarly structured for each personality trait: First a description of the personality trait was given, and then on each subsequent page after an introduction to the task, there was a target text followed by several questions relating to the judge's perception of the text's author.

The target texts were taken from an e-mail corpus collected previously (Gill, 2003). This consisted of texts from 105 participants each of whom produced two texts describing their previous week, and plans for the next week, written as if to a good friend. These texts were collected under experimental conditions via the world-wide web, from mainly British English speakers who also completed the EPQ-R short form (Eysenck & Eysenck, 1991). From this set, 18 were selected for the experiment; six texts were chosen to represent a range of author personality for each dimension. Two extreme high texts were selected (greater than 1 standard deviation above the mean), along with one moderately high text (>.5 but <1 SD above mean). Similarly, we selected 1 moderately low (>.5 but <1 SD below mean), and two extreme low texts (>1 SD below the mean). This was repeated for each of the three personality dimensions; in each case, the scores for the other dimensions were controlled at $<\pm 1$ SD of the mean, and in most cases $<\pm .5$ SD. Mean length of texts in words were: Psychoticism = 258.67, Extraversion = 261.33, Neuroticism = 261.00.

The rating questionnaire was divided into three sections, one for each personality trait (Psychoticism, Extraversion, or Neuroticism); the terms "Tough-mindedness" and "Emotionality" were used instead of Psychoticism and Neuroticism. The texts for each dimension were arranged in random order, and the order for each dimension determined by a Latin square technique. Booklets were then given an identification code, to maintain judge anonymity.

The booklet was prefixed by an introduction emphasising our interest in 'how subjects think the author comes across', the need for them to answer 'honestly and accurately' and 'not to spend too long thinking about each question'. Here judges were asked to rate author personality on the basis of a single exemplar description provided for each of the three traits. These were based upon those of Eysenck and Eysenck (1991), but with minor re-wording to enhance intelligibility and minimise issues of social desirability.

Judges were then asked 'How (Tough-Minded/Extravert/Emotionally-Stable) is the author of the e-mail?', with the extremes of the 10-point scale labelled 'Not at All' and 'Very (Tough-Minded/Extravert/Emotionally-Stable)'.

Although it is more usual to rate personality using a standard set of questions (Costa & McCrae, 1992; Eysenck & Eysenck, 1991; cf. Ten-Item Personality Inventory, Gosling, Rentfrow, & Swann, 2003), Sneed (1998) have found that factors and their manifestation through behaviour can easily be identified using exemplars. Here we utilise single-item, exemplar-based rating to provide a quick method of measuring impressions of author personality. Finally, in order to examine whether judges were able to subjectively rate author personalities in relation to their own, they were asked 'How similar would you say is the personality of this e-mail's author to yours?' rated on a 10-point scale ranging from 'Very Different' to 'Very Similar'.

Finally as part of debriefing, judges completed the EPQ-R (Eysenck & Eysenck, 1991). This measure was chosen since it is a reliable and valid measure of the two personality traits at the centre of this study, Extraversion and Neuroticism (Kline, 1993; cf. Costa & McCrae, 1986); additionally it also gives the opportunity to study the behaviour of Psychoticism in CMC environments.

3.3. Procedure

Judges worked through the rating booklet at their own speed. Although there was no official time limit, they were encouraged to work 'quickly and efficiently' to minimise reflection and retain motivation. Several judges participated in the experiment at the same time, under exam-type conditions, over-seen by the experimenter. Equal numbers of participants were randomly assigned to each questionnaire. Finally, judges received payment for participation in the study.

4. Results

4.1. Judges

The judges' completion of the EPQ-R (short form; Eysenck & Eysenck, 1991) gave the following results: Psychoticism Mean score: 3.17, SD 2.4; Extraversion Mean score: 7.30, SD 2.6; Neuroticism Mean score: 5.30, SD 3.1; and Lie Scale Mean score: 3.27, SD 2.0. These indicate that the judges' personality profile is similar to the published norms.

4.2. Consistency and agreement of judges' ratings

All six authors for each of the three personality traits were scored on a 10-item scale (1–10) by each judge. Concordance between the judges was measured using Kendall's W, and in all cases the Kendall coefficient reached a level of statistical significance, indicating relative agreement among judges concerning the trait score of each text (Psychoticism, 0.287 ($W(5) = 43.05$; $p < 0.0001$); Extraversion, 0.471 ($W(5) = 70.64$; $p < 0.0001$); Neuroticism, 0.266 ($W(5) = 38.91$; $p < 0.0001$)). Additionally we examine how each judge agrees with each of the others. Therefore, correlations were performed for each judge with each of the other judges, and a further mean derived from the mean correlation of each judge (displayed in the second column of Table 1). Given the ordinal nature of the rating scale responses, Spearman rank correlations are used throughout these analyses.

From these results, Extraversion is shown to have the greatest inter-judge agreement, and in these terms appears to be the easiest trait to rate (mean $r_s = 0.482$). Psychoticism (mean $r_s = 0.333$), and Neuroticism (mean $r_s = 0.308$) both show lower levels of agreement, which suggests that they are harder to rate.

We have reported the means of these correlations, without using Fischer's r to z conversion, given the small number of cases, and since Spearman rank correlations are non-parametric, and therefore make no assumptions about the normal distribution of the data (Cohen & Cohen, 1983). To establish the significance of agreement between judges, intraclass correlations were cal-

Table 1
Target and judge agreement

Trait	Inter-judge	Target-judge
Psychoticism	0.333	0.754
Extraversion	0.482	0.886*
Neuroticism	0.308	−0.377
Mean P–E–N	0.374	0.421

Note: Inter-judge agreement is here reported as Mean r_s of each judge correlated with every other judge, and then the mean agreement calculated across all judges. Target-judge agreement is reported as aggregate r_s by calculating the mean of each judge's ratings correlated with each target's ratings.

* Indicates significance at $p < 0.05$.

culated across the 30 judges for their ratings of P, E, and N targets (the equivalent of performing correlations between all possible pairs of raters; McCrae & Costa, 1987). Again, Extraversion showed the highest agreement, with an intraclass correlation of 0.403, with relatively lower agreement for Psychoticism (0.206), and Neuroticism (0.248); all significant at $p < 0.0001$.

4.3. Target-judge correlation

We calculate the aggregate measure of personality ratings across multiple raters since McCrae and Costa (1987) suggest that this takes into account how the target is seen by the judgement group overall. Thus, we correlated the targets' raw EPQ-R score and mean judges' ratings (1–10) for each target: Extraversion $r_s = 0.886$; Psychoticism $r_s = 0.754$; Neuroticism $r_s = -0.377$ (Spearman, pairwise, two-tailed, six cases). Of these, only ratings of Extraversion showed significant target-judge agreement ($p < 0.05$; Psychoticism demonstrated significance at the $p < 0.1$ level).

4.4. Quality of targets

Turning to the target texts, if one text for a personality trait is particularly difficult to rate, then we expect greater variability in judges' ratings for it. Levene's test for homogeneity of variance was used to investigate this. Although significant differences were not found for Extraversion or Neuroticism, they were found for Psychoticism ($F(5,174) = 2.868$, $p < 0.05$). High Psychotic texts (2 high-P, and the mid-high-P) consistently showed the greatest variance in ratings, which suggests that the judges found these more highly Psychotic authors the most difficult to rate.

4.5. Judge personality and similarity ratings

Comparison of inter-judge and target-judge agreement for judges grouped as 'high' or 'low' (via a mean split) for Psychoticism, Extraversion or Neuroticism failed to find a significant difference across groups. We therefore turn to the analysis of similarity ratings to investigate how judges perceived the target author personalities relative to their own.

The six target texts for each personality dimension were grouped into categories of High, Mid, and Low. At this stage we ignore the judges' own personality scores, since here we are solely

interested in overall similarity effects for the judges as a whole. A within subjects analysis of variance (ANOVA) revealed effects of text personality type on ratings of similarity for Psychoticism ($F(2,58) = 7.999$, $p < 0.001$, $MSE = 1.6$), and for Extraversion ($F(2,58) = 4.052$, $p < 0.05$, $MSE = 1.6$), but not Neuroticism texts. Tukey HSD tests revealed that significant differences in similarity ratings were found between LowP ($M = 5.6$) and HighP ($M = 4.3$), and also HighP ($M = 4.3$) and MidP ($M = 5.1$) Psychoticism texts, and between the HighE ($M = 5.3$) and MidE ($M = 4.3$) Extraversion texts (all significant at $p < 0.05$).

Now, we investigate the use of judge similarity ratings as a way of measuring agreement of personality ratings between judges and the authors of the target texts. Here judges were categorised as either 'high' or 'low' on the personality dimension in question using a mean split. A two factor mixed-design ANOVA revealed for Psychoticism main effects of judge personality type ($F(1,28) = 6.555$, $p < 0.05$, $MSE = 3.1$) and (as would be expected) personality of text author ($F(2,56) = 8.063$, $p < 0.001$, $MSE = 1.6$). However, no interaction effect was found between judge personality and text author personality in the ratings of similarity. Within subjects ANOVA of only the low Psychoticism judges shows an effect of text type on similarity rating ($F(2,32) = 5.753$, $p < 0.01$, $MSE = 1.9$). Tukey tests revealed significant results ($p < 0.05$), with low Psychoticism judges rating themselves as most similar to the LowP texts ($M = 6.2$), and most dissimilar to the HighP texts ($M = 4.6$). The lack of interaction noted above can be attributed to high Psychoticism judges' tendency also to rate themselves as most dissimilar to the HighP texts; but this effect was only marginally significant at $p < 0.1$.

The two factor mixed-design ANOVA revealed for Extraversion a main effect for text personality type on similarity rating ($F(2,56) = 4.390$, $p < 0.05$, $MSE = 1.5$), and also an interaction effect for judge and text personality upon similarity ratings ($F(2,56) = 3.430$, $p < 0.05$, $MSE = 1.5$). Within subjects ANOVA of only the highly Extraverted judges shows (as expected from the significant interaction) effects of text type on their similarity ratings ($F(2,26) = 5.082$, $p < 0.05$, $MSE = 1.9$). Tukey tests reveal significant effects ($p < 0.05$): the highly Extraverted judges rated the HighE texts as most similar to themselves ($M = 6.1$) and the MidE texts as least similar ($M = 4.5$). No effects were found for Neuroticism.

5. Discussion

Regarding traits, it was expected that visibility and evaluativeness would influence perception. In particular, it was expected that Extraversion would be the easiest to perceive, with Psychoticism and Neuroticism more difficult. Regarding information, it was expected that CMC would have a uniform effect on Psychoticism and Neuroticism, making them similar in ease of perception.

Extraversion shows the greatest inter-judge agreement, and the best target-judge agreement, with a strong and significant correlation. This is consistent with previous findings, and reflects Extraversion's more observable and less evaluative properties. Neuroticism and Psychoticism both show lower levels of inter-judge agreement. However, turning to target-judge agreement, although both levels of agreement are lower than for Extraversion, Psychoticism actually shows a strong positive correlation approaching significance whilst Neuroticism demonstrates a weak and non-significant *negative* correlation.

The results conform with McCrae and Costa's (1978) findings, where Neuroticism shows relatively low agreement, compared with Conscientiousness and Agreeableness, which are the closest five-factor analogues of Psychoticism. But the results differ from Goma-i-Freixanet (1997)'s three factor study, where Neuroticism had marginally better target-judge agreement than Psychoticism. In Funder's Realistic Accuracy terms, it seems that Neuroticism is a 'bad' trait, with higher evaluativeness and lower visibility compared with Extraversion. But why does CMC information apparently affect Neuroticism more than Psychoticism?

The perceived similarity results bear on this question. For Extraversion, the high target-judge agreement already suggests the trait is visible and accurately perceived. The interaction effect in the similarity judgements demonstrate that the trait is less evaluative, despite the apparent desirability which leads the judges as a whole to rate themselves as more similar to the high Extravert targets. By contrast, target-judge agreement is still high for Psychoticism. Given its visibility, the lack of an interaction effect in similarity judgements would result from this trait's greater evaluativeness. Now consider the low target-judge agreement for Neuroticism. If the trait is evaluative, then the lack of any discernible pattern in the similarity judgements suggests that low visibility is an interfering factor. Perhaps e-mail fails to provide 'good information' for accurate judgement of this less visible trait.

But previous studies of the e-mail data have shown that linguistic features of Neuroticism are projected in CMC (Gill, 2003). So it may be that the judges are attending to the *wrong* information (cf. Scherer, 1972, whose speech study found a high level of inter-rater reliability for Extraversion, but little target-judge agreement). In our CMC case, for Neuroticism, judges may be attending to misinformed linguistic cues, perhaps primed by the exemplars used for rating. The exemplars seemed appropriate for Extraversion and Psychoticism, but it could be that the descriptions of Neuroticism increase the evaluativeness of this measure, and focus attention on the wrong linguistic features (cf. John & Robbins, 1993).

To follow up on these results, it is possible to determine which linguistic features are associated with perceived Neuroticism, and this would help construct a Brunswik lens model for this domain (Brunswik, 1956). But it is also necessary to establish to what extent the Neuroticism result is replicated with a larger sample; this would also allow more detailed analysis of the influence of judge personality, or other characteristics, on ratings. A more complex experimental design would also give scope for acquaintance-reports on targets, similarity measures, and direct comparison of single exemplar-measures and multi-item measures, possibly also including the Ten-Item Personality Inventory (Gosling et al., 2003). Finally, further investigation of Neuroticism's apparent low visibility demands explicit comparison with the high visibility for Openness being found in the literature.

6. Conclusion

From a text of around 300 words, 30 judges were able to consistently agree (both with each other and with the target individual's self-rating), on the personality of the text's author when rating them for Extraversion and to a slightly lesser extent, for Psychoticism. In both cases, judges used an exemplar-based rating of personality rather than a multi-item personality questionnaire. In addition, judges rated perceived target similarity. Although judges generally agreed with each

other regarding ratings of Neuroticism, unexpectedly little consistency was found with the targets' own personality assessments, or with perceived similarity. We propose that this is due to characteristics of the trait itself, interacting with the CMC environment at zero-acquaintance, which leads judges to attend to the wrong information.

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