



Brief Report

How extraverted is honey.bunny77@hotmail.de? Inferring personality from e-mail addresses

Mitja D. Back *, Stefan C. Schmukle, Boris Egloff

Department of Psychology, University of Leipzig, Seeburgstr. 14-20, 04103 Leipzig, Germany

Abstract

Computer mediated communication (CMC) plays a rapidly growing role in our social lives. Within this domain, e-mail addresses represent the thinnest slice of information that people receive from one another. Using 599 e-mail addresses of young adults, their self-reported personality scores and the personality judgments of 100 independent observers, it was shown that personality impressions based solely on e-mail addresses were consensually shared by observers. Moreover, these impressions contained some degree of validity. This was true for neuroticism, openness, agreeableness, conscientiousness, and narcissism but not for extraversion. Level of accuracy was explained using lens model analyses: Lay observers made broad use of perceivable e-mail address features in their personality judgments, features were slightly valid and observers were sensitive to subtle differences in validity between cues. Altogether, even the thinnest slice of CMC—the mere e-mail address—contains valid information about the personality of its owner.

© 2008 Elsevier Inc. All rights reserved.

Keywords: Personality judgment; Impression formation; Accuracy; Zero acquaintance; Lens model; e-mail; Computer mediated communication; Stereotypes

1. Introduction

“Nomen est omen”

Imagine receiving an e-mail from honey.bunny77@hotmail.de. What conclusions would you draw about the personality of the owner of this e-mail address? Perhaps, you would assume the owner to be a rather extraverted person. Would your judgment be correct?

In everyday life, judging others is a ubiquitous phenomenon. We infer personality traits of other individuals even from minimal information and tend to stick to our first impressions. The accuracy of interpersonal perceptions is therefore crucial for successful social interactions. Recent research has revealed that personality judgments at zero acquaintance show at least some validity. First impressions do not exclusively lie in the eye of the beholder, but are consensually shared by lay observers or acquaintances and are correlated with observable behaviors and other ecologically valid criteria. This has, for example, been shown to be true for

* Corresponding author. Fax: +49 341 9735909.

E-mail addresses: honey.bunny77@hotmail.de, mback@uni-leipzig.de (M.D. Back).

real life encounters (e.g. Levesque & Kenny, 1993), thin slices of videotaped behavior (e.g., Borkenau & Liebler, 1992), streams of thought (Holleran & Mehl, in press) and stills (e.g., Borkenau & Liebler, 1992). Moreover, perceivers are able to accurately predict the personality of strangers on the basis of targets' offices and bedrooms (Gosling, Ko, Mannarelli, & Morris, 2002) or their music preferences (Rentfrow & Gosling, 2006).

Nowadays, a rapidly growing proportion of our social interactions and perceptions occur via computer mediated communication (CMC). One of the most pervasive forms of CMC is presumably e-mail (Thurlow, Lengel, & Tomic, 2004). There is an increasing trend to exchange personal and task-oriented information via e-mail or other forms of text-based CMC—a communication domain with its own linguistic structure and social consequences (e.g. Baron, 1998). The accuracy of CMC-based personality impressions (e-perceptions), especially in the context of e-mail communication, is thus of growing importance for our social lives.

This study examined whether first impressions based solely on knowledge of an e-mail address show some degree of consensus and accuracy. To this end, we analyzed e-mail addresses as a medium for personality expressions and impressions: How personality manifests itself in e-mail addresses and how e-mail addresses influence the personality judgments of strangers.

2. Background and research questions

Previous studies on e-perceptions have concentrated on personality judgments based on personal websites (Marcus, Machilek, & Schütz, 2006; Vazire & Gosling, 2004) or on text-based personal communication (Markey & Wells, 2002; Rouse & Haas, 2003). Compared to these domains, mere e-mail addresses contain considerably less information—they are, so to speak, the thinnest slice of a person perceivable via CMC. Another research tradition examined personality stereotypes based on (non-Internet) names and nicknames (e.g., Leierer, Hamilton, & Carpenter, 1982; Mehrabian, 2001). These studies indicate that names have a powerful influence on first impressions but did not analyze whether these impressions are correct. In the present study, we examined the consensuality and validity of thinnest slice e-perceptions for the Big Five (neuroticism, extraversion, openness, agreeableness, conscientiousness) and narcissism as personality traits that may express themselves and impress others through e-mail addresses.

We first analyzed whether there is consensus in thinnest slice e-perceptions due to “shared stereotypes” and “shared meaning systems” (Kenny, 1994). Thus, we examined whether lay observers agreed in their personality judgments based on e-mail addresses (*Question 1: Consensus*)? While, however, accuracy implies consensus, consensus does not necessarily imply accuracy, since all perceivers might be wrong (Kenny, 1994). Thus, we analyzed whether first impressions based solely on e-mail addresses contain some degree of validity, that is: Were observer impressions accurate (*Question 2: Accuracy*)?

Besides answering the intriguing question as to whether others can be judged by their e-mail address, this study aimed to examine *how* accuracy of thinnest slice e-perceptions was or was not achieved. Models of interpersonal perception (e.g., Brunswik, 1956; Funder, 1995; Gosling et al., 2002; Kenny, 1994) assume that accurate stranger ratings are made when (a) perceivers make use of available cues (cue utilization), (b) available cues have some validity (cue validity) and (c) perceivers use these cues according to their respective validities (sensitivity).

In line with these theoretical concepts, we analyzed whether strangers use features of e-mail addresses in judging personality and what kind of cues they use for different types of judgment. That is, we examined the influence of e-mail address features on observer impressions (*Question 3a: Cue Utilization*). Moreover, we also examined whether a basis for accurate judgments exist: That is, to what extent features of e-mail addresses provide valid personality cues (*Question 3b: Cue Validity*). Finally, we investigated whether perceivers are sensitive to the validity of cues, i.e., do judges use the appropriate features of e-mail addresses to the right extent in judging personality (*Question 3c: Sensitivity*)?

3. Method

In order to address the research questions, three independent data sources were collected: Personality scores of e-mail address occupants as accuracy criteria (target personality), visible features of e-mail addresses (cues) and lay personality judgments based on e-mail addresses (observer ratings).

3.1. Target personality

Six hundred young adults participated in a web-based survey. One participant was excluded on account of too many missings, so that the final sample consisted of 599 participants (457 women) with an average age of 16.04 ($SD = 0.52$). Participants provided their e-mail address and completed a brief personality questionnaire. This questionnaire comprised short forms of the Big Five Inventory (Rammstedt & John, 2007) and the Narcissistic Personality Inventory (Raskin & Terry, 1988).

3.2. Cues

In order to analyze how personality is expressed in e-mail addresses and how e-mail addresses impress lay perceivers a number of e-mail address characteristics (cues) were obtained. The choice of cues was based on extensive inspection of available e-mail addresses by five independent members of the research team. Each of them was given the total number of e-mail addresses with the instruction to subdivide them into a number of coherent groups, each consisting of similar e-mail addresses. Subsequently, they had to expatiate which features of e-mail addresses they had used to carry out the sorting task. Afterwards, each person was asked to produce additional characteristics of e-mail addresses using a thinking-aloud technique. Finally, to avoid redundancies, highly similar characteristics (e.g., funny and humorous) were combined.

According to this procedure, three kinds of e-mail features were then quantified. First, objective cues were obtained by means of counting (e.g. number of underscores) or categorization (e.g. is the provider “yahoo” or not; does the e-mail address contain an own name or a fantasy name). Second, four coders independently rated the gender of the respective occupant of each e-mail address (from 1 = “definitely a woman” to 6 = “definitely a man”; Cronbach’s $\alpha = .98$). Thirdly, the four coders rated each of the 284 fantasy name e-mail addresses with respect to six content-related features (e.g., creativity of e-mail address). All codings were reasonably reliable, with a mean alpha coefficient of .70 across features.

3.3. Observer ratings

Hundred students (69 women) participated as lay observers in exchange for research participation credit. Their average age was 22.14 years ($SD = 3.73$). E-mail addresses were randomly displayed on a computer screen. For each address, perceivers were required to make 11 personality ratings. For Big Five ratings, we applied the same 10 items that had been used for the self-ratings. For narcissism, the item “Regards him/herself as something special” was used. Eight independent groups of 12 to 13 participants were formed and each e-mail address was rated by two of the groups. Thus, each observer rated 150 e-mail addresses and each e-mail address was rated by 24 to 26 perceivers. Composite observer rating scores were obtained for each of the six personality dimensions and each target by aggregating across observers and items.

4. Results

4.1. Question 1 (Consensus): Did observers agree in their personality judgments?

In order to estimate the consensuality of impressions, we calculated within each of the eight observer groups both the reliability of single ratings using the intraclass correlation $ICC(2, 1)$, and the corresponding reliability of ratings averaged across observers $ICC(2, k)$ (Shrout & Fleiss, 1979). We then computed mean intraclass correlations across the 8 groups of observers using Fisher’s r -to- Z formula. For significance testing, group was used as the unit of analyses and one-sample t tests were performed (see Kenny, 1994). As can be seen in Column 1 of Table 1, consensus was significant for all personality dimensions and strongest for ratings of extraversion followed by conscientiousness and narcissism.

Table 1

Judgments based on e-mail addresses: accuracy, consensus, cue validity, cue utilization and sensitivity

Personality dimensions	Question 1: Consensus	Question 2: Accuracy	Question 3: Lens model analysis		
			Cue utilization	Cue validity	Sensitivity
Neuroticism	.06 (.44)**	.08*	.60**	.18 ⁺	.48*
Extraversion	.19 (.74)**	.05	.74**	.05	-.09
Openness	.07 (.47)**	.13**	.56**	.22**	.58**
Agreeableness	.08 (.50)**	.08*	.56**	.12	.47*
Conscientiousness	.14 (.66)**	.12**	.76**	.22**	.27
Narcissism	.12 (.62)**	.09*	.75**	.21*	.33

Notes. Consensus is the mean single-rater intraclass correlation, ICC (2, 1), across eight groups of observers ($N = 12\text{--}13$ perceivers per group). The average-rater intraclass correlation, ICC (2, k) with $k = 12\text{--}13$ is shown in parentheses. For significance testing, group was used as the unit of analyses and one-sample t tests were performed (see Kenny, 1994). Accuracy is the correlation between aggregated observer ratings and targets' self-reports ($N = 599$). Cue utilization is the adjusted R when mean observer ratings were regressed on cue scores. Cue validity is the adjusted R when targets' self-reports was regressed on cue scores. Sensitivity scores reflect the convergence (vector correlations) between absolute values of cue-utilization and cue-validity correlations. Significance of sensitivity scores is based on the number of e-mail address attributes coded (23). Mean correlations and vector correlations were computed using Fisher's r -to- Z formula.

⁺ $p < .10$, * $p < .05$, ** $p < .01$.

4.2. Question 2 (Accuracy): Were observer impressions accurate?

Accuracy was computed by correlating aggregated observer ratings with target self-ratings on each dimension. As can be seen in Column 2 of Table 1, accuracy scores were positive and significant for all personality dimensions except extraversion, with greatest accuracy being observed for openness. Accuracy scores were relatively low compared to other studies of zero acquaintance or e-perceptions based on websites. However, in light of the extreme narrowness of information provided by e-mail addresses, the finding of above chance level accuracy is a striking result.

In order to address how this level of accuracy was obtained, we applied lens model analyses (Borkenau & Liebler, 1992; Brunswik, 1956). We drew on the perceivable features of e-mail addresses (cues) and examined (a) the usage of cues, (b) the validity of cues and (c) the sensitivity of observers to the validity of cues.

4.3. Question 3a (Cue Utilization): Influence of e-mail address features on observer impressions

We first analyzed the extent to which observers make use of perceivable features of e-mail addresses by regressing mean observer ratings on multiple cue values for each personality dimension. The full information maximum likelihood (FIML) estimator for multiple regression models with missing data (Enders, 2001) was used due to the fact that content-related cues (e.g., creativity) were only present for e-mail addresses containing fantasy and not own names. Adjusted R values of the multiple regressions indicate the extent to which observers used perceivable features of e-mail addresses for their personality judgments. As can be seen in Column 3 of Table 1, these values were generally high and somewhat elevated for extraversion, conscientiousness and narcissism.

In order to analyze which cues were used for which personality dimension, we computed cue utilization scores for each single cue as the correlation between cue values and composite observer ratings (see right hand section of Table 2). Findings show that observers' judgments of targets were associated with a number of e-mail address attributes. For example, ratings of conscientiousness were positively related to the number of characters and the number of dots, but negatively related to the number of digits. Targets with fantasy names as opposed to own names as well as those with funny e-mail addresses and "hotmail" as provider were rated as more extraverted. Self-enhancing aspects and the salaciousness of e-mail addresses influenced impressions of narcissism. Furthermore, observer ratings indicated the usage of gender stereotypes: Targets that appeared to be female were rated as more neurotic, open, agreeable and conscientious.

Table 2
A lens model analysis of judgments based on e-mail addresses

Cue validity						Cues ("lens")	Cue utilization					
<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>	Nar.		<i>N</i>	<i>E</i>	<i>O</i>	<i>A</i>	<i>C</i>	Nar.
<i>Objective count or categorization^b</i>												
-.01	-.02	-.05	-.04	-.01	.06	# characters	.12	-.09	.05	.11	.37	-.06
.00	-.01	-.01	.04	.07	-.03	# dots	.20	-.31	-.11	.01	.30	-.29
.02	-.02	.04	.02	-.04	-.01	# hyphens	-.05	.09	.10	-.01	-.02	.07
.01	-.02	.09	-.03	-.03	-.05	# underscores	-.07	.07	-.03	.04	.01	.06
-.02	.05	.02	.02	-.02	-.02	# digits	-.08	.23	-.11	.04	-.31	.21
.01	.02	.05	.05	.05	-.07	web.	.06	-.03	.02	.04	.06	-.03
-.05	.01	-.03	-.07	-.01	.01	gmx.	.01	-.04	-.01	.03	.03	-.05
.04	-.02	.00	-.01	.02	-.01	yahoo.	.00	.03	-.04	.04	-.01	.03
.01	-.07	-.03	.06	-.03	-.01	aol.	-.03	.09	-.04	-.10	-.16	.14
.03	-.02	-.01	.02	-.04	.04	hotmail.	-.03	.11	.04	-.05	-.06	.07
.02	.03	.03	.01	.06	.00	freenet.	.03	-.03	-.01	-.04	.01	-.02
.00	.02	.05	-.01	.01	.01	t-online.	.03	-.12	-.03	-.03	.09	-.09
.06	.05	.07	-.02	.12	-.04	.de	.11	-.13	.03	.08	.21	-.16
-.08	.02	-.06	-.04	-.04	.04	.net	-.06	.00	-.04	-.05	-.06	.06
.01	-.07	-.04	.05	-.12	.01	.com	-.09	.16	.00	-.06	-.21	.15
.02	.02	.02	-.01	-.07	.01	fantasy name (vs. own name)	-.46	.61	.24	-.06	-.60	.59
<i>Perceived gender of target^{a,b}</i>												
-.15	-.08	-.18	-.08	-.13	.15		-.35	.01	-.39	-.24	-.38	.02
<i>Ratings of fantasy name e-mail addresses^c</i>												
-.07	.02	.10	-.09	-.16	.09	creative	-.25	.37	.18	-.11	-.15	.32
.07	.03	.05	.06	.14	-.08	cute	.25	.19	.27	.53	.17	.07
-.05	.02	.07	-.05	.00	.14	salacious	.00	.29	-.13	-.07	-.17	.35
-.21	-.02	-.02	-.12	-.08	.15	self-enhancing	-.34	.58	-.11	-.26	-.36	.63
.09	-.08	.09	.04	-.01	.03	confusing	.07	-.39	-.16	-.33	-.11	-.25
-.07	.01	.03	-.01	-.14	.07	funny	-.23	.38	.05	.02	-.20	.28

Notes. Coefficients represent Spearman rank correlations when cues are counted due to skewed distributions, point-biserial correlations when cues are coded as present (1) vs. absent (0), and Pearson correlations when cues are rated. Counts are indicated by #. Cue validity is the self-rating/cue correlation, and cue utilization is the observer rating/cue correlation with neuroticism (*N*), extraversion (*E*), openness to experience (*O*), agreeableness (*A*), conscientiousness (*C*), and narcissism (Nar.), respectively.

^a Perceived gender of target is rated on a scale ranging from 1 = "definitely a woman" to 6 = "definitely a man".

^b $N = 599$; for $r \geq |.07|$, $p < .10$, $r \geq |.08|$, $p < .05$, and $r \geq |.11|$, $p < .01$.

^c $N = 284$; for $r \geq |.10|$, $p < .10$, $r \geq |.12|$, $p < .05$, and $r \geq |.15|$, $p < .01$.

4.4. Question 3b (Cue Validity): To what extent do features of e-mail addresses provide valid personality cues?

We first analyzed whether there were any significant relations between personality and e-mail address attributes by regressing targets' self-reported personality scores on multiple cue values for each personality dimension. Adjusted *R* values of the multiple regressions indicate the extent to which e-mail address features reflected the personality of address occupants. Cue validities ranged from $R = .05$ for extraversion to $R = .22$ for openness and conscientiousness (see Column 4 of Table 1). Only few single cues significantly correlated with self-reported personality (see left hand section of Table 2). Narcissistic persons, for instance, had more self-enhancing e-mail addresses. The opposite was true for neuroticism. Conscientious persons had addresses that were less funny and more often contained the domain .de. Openness was positively correlated with the creativity of e-mail addresses and the number of underscores used. Moreover, gender stereotypes for neuroticism, openness, agreeableness and conscientiousness held a kernel of truth, with female targets obtaining higher scores on all dimensions.

4.5. Question 3c (Sensitivity): Did observers use available e-mail address features appropriately?

Observer sensitivity to the validity of cues can be estimated using the correspondence of cue validity and cue utilization correlations. We therefore computed column vector intercorrelations for each personality

dimension (see Borkenau & Liebler, 1992). These vector correlations are highly sensitive to the signs of single data entries, since these affect the variance of correlations within each vector. Vector correlations might thus be artificially inflated when the direction in which variables are coded is arbitrary. Since the coding for some of our cue variables was arbitrary (“self-enhancing” could, for instance, also have been labelled “self-diminishing”, resulting in reversed signs for respective cue validity and cue utilization correlations), we used a rather conservative strategy and correlated Fisher’s *Z*-transformed *absolute* values of cue validity and cue utilization correlations (cf. Rentfrow & Gosling, 2006). Resulting sensitivity scores are displayed in Column 5 of Table 1. They indicate how well observers draw on more valid cues in making their judgments. Sensitivity was strongest for openness followed by neuroticism, agreeableness, narcissism and conscientiousness. It was absent for extraversion.

5. Discussion

This study demonstrated that personality judgments based solely on e-mail addresses were widely shared by observers. Hence, consensual personality stereotypes exist about e-mail addresses. Moreover these consensual e-perceptions proved somewhat accurate: They significantly correlated with e-mail owner self-reports of personality for five (neuroticism, openness, agreeableness, conscientiousness and narcissism) of six personality dimensions. These findings were explained to a large extent by three factors that influence the accuracy of personality judgments in general: the use of available cues, the existence of valid cues and the sensitivity of observers to subtle variations in cue validity.

Judgments of openness proved most accurate. This finding was due to comparatively high cue validity and a high sensitivity of observers to the validity of cues. For conscientiousness and narcissism, accuracy was a little lower given a similar amount of cue validity, but a lower sensitivity of observers. The accuracy of agreeableness and neuroticism judgments was reflective of comparatively low cue utilization and cue validity scores. For extraversion, lay judgments were not significantly related to targets’ self-ratings, even though cue utilization and consensus were highest among all personality dimensions. This apparent contradiction can be explained by low cue validity and sensitivity scores. Interestingly, while comparatively strong and consensual lay theories thus exist concerning the degree of extraversion expressed through different e-mail addresses, these appear to be rather wrong: E-mail addresses do not seem to contain much valid information about their occupant’s level of extraversion.

Replications are certainly needed to confirm the present results, especially regarding the specific personality–cue and cue–judgment relations found in this study. Moreover, the present sample was relatively young and predominantly female. Thus, examining thinnest slice e-perceptions in other samples might be worthwhile. Additionally, research on e-perceptions might profit from experimentally varying certain aspects of e-mail addresses while keeping others constant (e.g., length, domain).

In sum, we were able to show that the e-mail addresses (“nomen”) we use can influence the impressions we make on other people. Moreover—and even more interestingly—these impressions contain a kernel of truth (“est omen”) for five of six personality dimensions. In light of the extreme narrowness of information and the complex processes involved in making accurate judgments, the mere existence of above chance level accuracy in personality judgments based on e-mail addresses is remarkable (e.g., Funder, 1995). An interesting exception to this finding was also found: Judgments of extraversion based on e-mail addresses were not accurate. Therefore, we would probably have (consensually) misjudged honey.bunny77@hotmail.de to be extraverted. Judging thefascinatingking@gmx.net to be narcissistic might, on the other hand, have been a pretty good guess.

Acknowledgments

Preparation of this article was supported by Grant BA 3731/1-1 from the German Research Foundation (DFG) to Mitja Back. We thank Nancy Voigt for her help with data collection and Steffen Nestler and Nancy Voigt for inspiring discussions of this research.

References

- Baron, N. S. (1998). Letters by phone or speech by other means: The linguistics of email. *Language & Communications, 18*, 133–170.
- Borkenau, P., & Liebler, A. (1992). Trait inferences: Sources of validity at zero acquaintance. *Journal of Personality and Social Psychology, 62*, 645–657.
- Brunswik, E. (1956). *Perception and the representative design of experiments*. Berkeley, CA: University of California Press.
- Enders, C. K. (2001). The performance of the full information maximum likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement, 61*, 713–740.
- Funder, D. C. (1995). On the accuracy of personality judgments: A realistic approach. *Psychological Review, 102*, 652–670.
- Gosling, S. D., Ko, S. J., Mannarelli, T., & Morris, M. E. (2002). A Room with a cue: Personality judgments based on offices and bedrooms. *Journal of Personality and Social Psychology, 82*, 379–398.
- Holleran, S. E., & Mehl, M. R. (in press). Let me read your mind: Personality judgments based on a person's natural stream of thought. *Journal of Research in Personality*, doi:10.1016/j.jrp.2007.07.011.
- Kenny, D. A. (1994). *Interpersonal perception: A social relations analysis*. New York: Guilford Press.
- Leirer, O., Hamilton, D. L., & Carpenter, S. (1982). Common first names as cues for inferences about personality. *Personality and Social Psychology Bulletin, 8*, 712–718.
- Levesque, M. J., & Kenny, D. A. (1993). Accuracy of behavioral predictions at zero acquaintance: A social relations analysis. *Journal of Personality and Social Psychology, 65*, 1178–1187.
- Marcus, B., Machilek, F., & Schütz, A. (2006). Personality in cyberspace: Personal web sites as media for personality expressions and impressions. *Journal of Personality and Social Psychology, 90*, 1014–1031.
- Markey, P. M., & Wells, S. M. (2002). Interpersonal perception in internet chat rooms. *Journal of Research in Personality, 36*, 134–146.
- Mehrabian, A. (2001). Characteristics attributed to individuals on the basis of their first names. *Genetic, Social, and General Psychology Monographs, 127*, 59–88.
- Rammstedt, B., & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality, 41*, 203–212.
- Raskin, R., & Terry, H. (1988). A principle components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54*, 890–902.
- Rentfrow, P. J., & Gosling, S. D. (2006). Message in a ballad: The role of music preferences in interpersonal perception. *Psychological Science, 17*, 236–242.
- Rouse, S. V., & Haas, H. H. (2003). Exploring the accuracies and inaccuracies of personality perception following Internet-mediated communication. *Journal of Research in Personality, 37*, 446–4467.
- Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin, 86*, 420–428.
- Thurlow, C., Lengel, L., & Tomic, A. (2004). *Computer mediated communication: Social interaction and the Internet*. London, England: Sage.
- Vazire, S., & Gosling, S. D. (2004). E-perceptions: Personality impressions based on personal websites. *Journal of Personality and Social Psychology, 87*, 123–132.