

# Do Shy People Prefer to Send E-Mail?

## Personality Effects on Communication Media Preferences in Threatening and Nonthreatening Situations

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**Abstract.** Personality aspects are largely neglected in existing models of media preferences. Based on a functional approach, it is hypothesized that media preferences are affected by Extraversion and Neuroticism particularly in situations that correspond to the motivational implications of these traits. The results of a questionnaire study ( $N = 228$ ) on preferences for communication media with varying levels of media richness (face-to-face conversation, e-mail) revealed Extraversion and Neuroticism as significant predictors of media preferences. Moreover, these effects were mediated by the motivational manifestations of these traits in social situations (i.e., social skills, social anxiety). Finally, the effects were moderated by the potential threat of a communication situation, showing significant trait effects particularly in social conflicts.

**Keywords:** media preferences, media richness model, personality, extraversion, neuroticism

Recent decades have brought major changes in the way we communicate with other people. The development of Internet-based communication technologies has substantially increased the range of communication media available. New media such as electronic mail (e-mail), instant messaging systems, and Web-based video-conferencing tools supplement more traditional means of communication such as face-to-face conversation, telephone, or conventional mail. Using new communication media, and e-mail in particular, not only has become common place in job-related settings (Dennis & Kinney, 1998; Hertel & Konradt, 2004; Luskin, 2002; Maruping & Agarwal, 2004; Stone, 2003) but also in many private interactions (e.g., Jackson et al., 2003; Kraut et al., 2002; Tyler, 2002). However, the effectiveness and efficiency of both traditional and new communication media can vary substantially.

Various theoretical models have been developed in recent years to explain and predict media preferences and media choice (e.g., Carlson & Zmud, 1999; Daft & Lengel, 1986; Dennis & Valacich, 1999; Rice, 1993; Treviño, Webster, & Stein, 2000; Walther, 1992). Key factors considered in these models are the content and purpose of communication, conditions of the situational context, and technical aspects of the media expertise of the people involved. What has been largely neglected, however, are determinants of media preferences that originate from stable personality dispositions. Apart from studies on the effects of personality on the consumption of mass media (e.g., Finn, 1997), there are only a few empirical studies that address the in-

fluence of personality on media preferences for interpersonal communication.

Consequently, the objective of the current study was to extend existing models of media preferences by examining personality dispositions and their motivational manifestations in social situations. In addition to communication content and context, we expected that media preferences would also be determined by the personality of the users and related motivational implications. Specifically, we expected that extraverted compared to introverted persons would more strongly prefer rich communication media that enable synchronous interaction on various channels (e.g., face-to-face conversation). Similarly, we expected that individuals high on Neuroticism compared to individuals low on Neuroticism would prefer less complex, asynchronous media that enable higher situational control and avoid direct interactions with others. We further expected that these effects would be mediated by self-efficacy beliefs and social anxiety as motivational manifestations of these general personality traits in social situations. Finally, we expected that the proposed differences would occur particularly in situations that correspond to the motivational manifestations of the personality differences. Both for Neuroticism and for Extraversion, this should be particularly the case in situations where the potential of social threat is high and direct communication is difficult and challenging. We first develop our propositions in more detail and then report an initial study testing these assumptions empirically.

## Communication Media Choices

Classic transmission models (e.g., Shannon & Weaver, 1949) describe communication as an interpersonal and context-dependent process during which a sender and a receiver exchange information on various communication channels in order to influence each other. The available communication media today can be categorized according to various features, such as whether the message is written (e.g., letter, fax, e-mail) or transmitted acoustically (e.g., face-to-face conversation, telephone), whether the involved persons interact at the same time (synchronously; e.g., face-to-face conversation, telephone, online chat) or at different times (asynchronously; e.g., e-mail, letter, voice-messages), whether the communication acts are initiated by the sender ("pushed") or by the receiver ("pulled"), or whether only one channel (e.g., e-mail) or multiple channels are used (e.g., face-to-face conversation; Maruping & Agrarwal, 2004; Walther, 1996; Wood & Smith, 2005). Apart from mere categorization, these features have important implications for the preference of communication media by users.

Preferences for communication media have been described in various descriptive and prescriptive models (e.g., Carlson & Zmud, 1999; Daft & Lengel, 1986; Dennis & Valacich, 1999; Rice, 1993; Treviño et al., 2000; Walther, 1992). Media richness theory (MRT; Daft & Lengel, 1986; Daft, Lengel & Treviño, 1987) is, perhaps, the most prominent approach and was developed as a theoretical framework for media choices at work, particularly for managers in organizations. Consistent with a general information-processing view of organizations, MRT asserts that the main goal of communication is to reduce uncertainty (e.g., by providing additional information) and ambiguity (e.g., by providing decision algorithms). Moreover, the efficiency of communication is largely determined by the relative match between the requirements of a certain communication task or goal and the specific functional features of the communication media used. Thus, successful communicators should choose communication media as a function of the relative level of insecurity and ambiguity of the given communication situation.

MRT, as well as more recent extensions such as the media synchronicity theory (MST; e.g., Dennis & Valacich, 1999; Maruping & Agrarwal, 2004), involves a framework for assessing different functionalities of communication media. The key characteristic in this framework is *richness*, defined in terms of the capability of media to change understanding within a time interval (Daft & Lengel, 1986; Maruping & Agrarwal, 2004; Rice, 1993). Media richness refers to a continuum determined by a number of related functionalities. Among them are the immediacy of feedback, the amount of information transferable during a given time interval, and the number of communication channels. Face-to-face conversation, for instance, can be considered as having a high richness level because multiple channels

(visual, auditory, etc.) are available, immediate feedback by both sender and receiver is possible, and the amount of information transferable – predominantly in oral mode – is high. Text-based e-mail, on the other hand, has a low level of richness because only one channel is used, immediate feedback is rare because of asynchronicity, and the amount of information transferred in a given time interval is low because the message must first be typed, sent, and then read by the recipient. Although text-based e-mails can be enriched by symbols expressing emotions of the sender ("emoticons," i.e., pictograms constructed from characters symbolizing human faces in various mood states), such verbal or para-verbal symbols provide only small parts of the complex context of information in a communication setting.

From an economic perspective, media with low richness levels might be considered as less effective because they require more time for the transmission of information. However, according to MRT and MST, it is not richness per se that determines media effectiveness (and media choice), but the relative match between richness and the specific requirements of a certain communication task (i.e., ambiguity and insecurity). Moreover, since media with higher richness levels are usually more expensive and/or time consuming, low richness media are often more cost-effective in situations where insecurity and chances of misunderstandings are low.

Although the propositions associated with MRT are quite plausible, empirical evidence for the MRT is described as rather ambiguous (Dennis & Kinney, 1998; Fulk & Collins-Jarvis, 2001). Apart from theoretical problems of the theory, such as multiple (and varying) dimensions of richness and situational ambiguity, the ambiguous evidence might also point to important moderator variables. Some potential moderators, such as the availability of communication media, have already been integrated into MRT (Treviño, Daft, & Lengel, 1990). Other potential moderators, such as communication habits, prior media experience, expertise of media use (Carlson & Zmud, 1999; Schmitz & Fulk, 1991), cognitive style (Treviño, Bodensteiner, Gerloff, & Muir, 1990), norms and rules within larger organizational contexts (Venkatesh & Davis, 2000), and the symbolic meaning of media still await a better integration (Irmer & Bordia, 2003). However, in addition to potential moderators originating from the situational context, personality dispositions and related motivational implications might be considered as moderators as well.

## Personality and Media Preferences

The relative level of uncertainty in a given communication situation is not only determined by external factors, but also by internal dispositions of the participating individual(s). Consequently, aspects of media richness not only have implications for the efficiency of communication but also for

the psychological needs and fears of the users (Jackson et al., 2003; Weiser, 2002). We argue that individuals strongly prefer communication media that better fulfill specific needs.

Prominent examples include the interest in and practice of direct interactions with communication partners and related self-efficacy beliefs as the motivational manifestation of extraversion, or the need for control and self-protection during communication as the motivational manifestation of Neuroticism. For instance, synchronous communication media not only have the advantage of high time-related efficiency because the partners can react to each other immediately, but also increase the intensity of interpersonal contact during a conversation (e.g., Nowak, Watt, & Walther, 2005). When the communication is potentially strained, as for instance in social conflicts, the higher intensity of interpersonal contact can facilitate clarification and discussion of the conflict but also requires sufficient social skills. Thus, synchronous communication under such challenging conditions should be preferred as a function of Extraversion and related self-efficacy beliefs of an individual. However, synchronous communication can also increase negative emotions and stress, which might be particularly aversive for individuals high on Neuroticism. Asynchronous communication, on the other hand, provides control and protection (O'Sullivan, 2000; Walther, 1996), which should be particularly attractive for persons high on Neuroticism. In fact, asynchronicity can sometimes facilitate the de-escalation of conflicts because the involved individuals can analyze the situation in a safe and nonthreatening atmosphere (Maruping & Agrawal, 2004).

In a similar way, the interests and fears of communicating people also correspond to the mode in which communication is transmitted. While oral communication provides better opportunities for direct interpersonal contact, written communication provides more opportunities for control and protection against dominant or verbally more dexterous partners. Although the transmission mode is conceptually independent from synchronicity of communication media (e.g., voice-mail as an example of oral asynchronous communication, online chat systems as an example of synchronous written communication), in practice the two aspects are usually correlated because oral communication is predominantly realized by synchronous communication media (face-to-face conversation, phone, etc.), while written communication is more often based on asynchronous media (e-mail, letter, fax, etc.).

Finally, the number of channels of communication media correspond to interests and fears of individuals during communication. A high intensity of interpersonal contact and closeness is more easily realized with multichannel communication media (face-to-face communication, etc.). High control over communication processes, on the other hand, is easier when only a few communication channels are involved (e.g., writing a letter or an e-mail; Stritzke, Nguyen, & Durkin, 2004). Together, synchronicity, transmission mode, and number of channels of communication

media not only have implications for the efficiency of communication processes, but also correspond to the fulfillment of different interests and needs of the users, such as the need for control and self-protection or communication-related self-efficacy beliefs, which are partly determined by personality dispositions.

Surprisingly, only a few empirical studies have addressed personality factors in the context of new communication media (Amichai Hamburger & Ben-Artzi, 2000; Jackson et al., 2003; Marcus, Machilek, & Schütz, 2006; Renner, Schütz, & Machilek, 2005; Swickert, Hittner, Harris, & Herring, 2002; Tuten & Bosnjak, 2001), and even fewer have explored personality factors as determinants of people's communication media preferences (Joinson, 2004; Sheeks & Birchmeier, 2007; Stritzke et al., 2004). In one of these studies, Joinson (2004) demonstrated that communication media preferences were affected by participants' self-esteem. Low-self-esteem participants showed greater preference for e-mail compared to face-to-face communication in various hypothetical scenarios. Moreover, low odds of success lead to an increase in preference for e-mail, at least in some of the scenarios. These results are consistent with our motivational perspective of media preferences. However, these effects have yet to be integrated into a broader personality approach. Moreover, it would be interesting to explore the mediating psychological mechanisms of the observed personality effects.

Our theoretical approach builds on a multilevel conceptualization of the Big Five personality model (Costa & McCrae, 1992; Digman, 1990; Goldberg, 1992). In this approach, general traits, such as Extraversion or Neuroticism, can be distinguished from motivational subsets or manifestations of the traits in social situations (e.g., specific self-efficacy beliefs, social anxiety) that mediate effects of general traits on behavior. As discussed above, effects of Extraversion should be particularly visible for media that correspond to users' interest in direct contacts with others and related self-efficacy beliefs, whereas effects of Neuroticism should be particularly visible for media that correspond to users' needs for control and self-protection (Furnham, 1981; Costa & McCrae, 1992).

Extraverts are described as social, active, and talkative, and are, in general, more strongly interested in interactions with other people compared to introverts. From a need-oriented perspective, extraverts should enjoy higher levels of stimulation and prefer communication media that enable direct and immediate contact with others. Moreover, this effect should be mediated by higher self-efficacy beliefs regarding social skills as a more behavior-related motivational manifestation of extraversion. Because of their higher interest in social contacts and more successful interactions with others, extraverts are expected to develop more social skills than introverts (Levin & Stokes, 1986; Stokes, 1985). In contrast, introverts are expected to have a lower need for social interaction (it should be noted that this is not synonymous with social anxiety; see Borkenau & Ostendorf, 1993) and, thus, should acquire fewer social

skills. Consequently, introverts should feel more comfortable with media of lower richness levels in the sense of asynchronous and written media<sup>1</sup>. Stated more formally, we expect:

- Hypothesis (H1a): Compared to introverts, extraverts should more strongly prefer communication media with high richness levels.
- Hypothesis (H1b): This relationship should be mediated by self-efficacy beliefs regarding social skills as a motivational manifestation of extraversion.

The expected influence of Neuroticism on media preferences is also based on a motivational perspective. Individuals high on Neuroticism are described as rather timid in social situations and report negative affective states more often than individuals low on Neuroticism (Costa & McCrae, 1992). As a consequence, individuals high on Neuroticism should have a higher need for control in social interactions. Communication media with low richness levels, such as asynchronous written media, provide higher control compared to synchronous, multichannel communication media. This is because communicators are not directly confronted with the (emotional) reactions of their counterparts, and fewer communication channels are involved. E-mail or written letters, for instance, provide more time for preparation and rehearsal, people can consider their opinions and interests in a safe atmosphere, can formulate their arguments with as much time as they need, and can ask others for advice before sending or responding to a message. Thus, compared to individuals low on Neuroticism, persons high on Neuroticism should more strongly prefer communication media with low richness levels, and this relationship should be mediated by social anxiety. Stated more formally, we expect:

- Hypothesis (H2a): Compared to individuals low on Neuroticism, individuals high on Neuroticism should more strongly prefer communication media with low richness levels.
- Hypothesis (H2b): This relationship should be mediated by social anxiety as a motivational manifestation of neuroticism.

Finally, in addition to the discussed main effects of personality variables and mediation effects of motivational subsets, we expect a moderating influence of the type of communication situation. If, as asserted, the effects of personality differences are a result of their motivational manifestations, they should particularly occur in situations that correspond to these motivational manifestations. For instance, social anxiety and higher need for self-protection as manifestation of high levels of Neuroticism should be

particularly triggered in situations where the potential of social threat is high compared to nonthreatening settings. In a similar way, high perceived social skills as a manifestation of high levels of Extraversion should be particularly triggered in situations where communication is difficult and challenging. Thus, the effects of Neuroticism and Extraversion on media preferences should be particularly evident in potentially threatening situations, such as social conflicts. In less difficult and nonthreatening communication situations, the personality effects described are expected to be weaker or not visible at all. Stated more formally, we expect:

- Hypothesis (H1c): Difficulty and potential threat of a communication situation should moderate the relationship between Extraversion and media preferences. The effects of Extraversion on media preferences should be stronger in difficult and potentially threatening situations compared to nonthreatening situations.
- Hypothesis (H2c): Potential threat of a communication situation should moderate the relationship between Neuroticism and media preferences. The effects of Neuroticism on media preferences should be stronger in potentially threatening situations compared to nonthreatening situations.

Please note that our distinction between situations with different levels of potential social threat is different from the distinction between “strong” and “weak” situations suggested by Mischel (1977) and recently discussed as moderators of a personality effect on performance or cooperative decisions (e.g., Beaty, Cleveland, & Murphy, 2001; de Kwaadsteniet, van Dijk, Wit, & de Cremer, 2006). Whereas the latter distinction merely refers to the amount of normative structure and lack of latitude in a social situation, our distinction is more specific and explicates situational triggers of specific needs and interests associated with personality attributes.

Although our predictions for Extraversion and Neuroticism are similar in their effects, the underlying processes are conceptualized slightly different. Whereas the effects of Extraversion are considered as mainly mediated by self-efficacy beliefs about social skills, the effects of Neuroticism are considered as mainly mediated by social anxiety. However, both processes can also overlap because Extraversion and perceived social skills can be related to (a lack of) social anxiety, and Neuroticism and social anxiety can restrict the development of social skills (Stokes, 1985). By exploring both traits and related mediating processes in the same study, we gain more insight into the relative weight of the two traits. A summary of our model assumptions and hypotheses is displayed in Figure 1.

<sup>1</sup> The relationship between social skills and personality variables is still controversial. Some authors consider social skills as related to Agreeableness in the Big Five framework; others even consider social skills to be independent from personality dispositions (e.g., Witt & Ferris, 2003). We must refrain from a more thorough discussion of this issue because of space constraints.

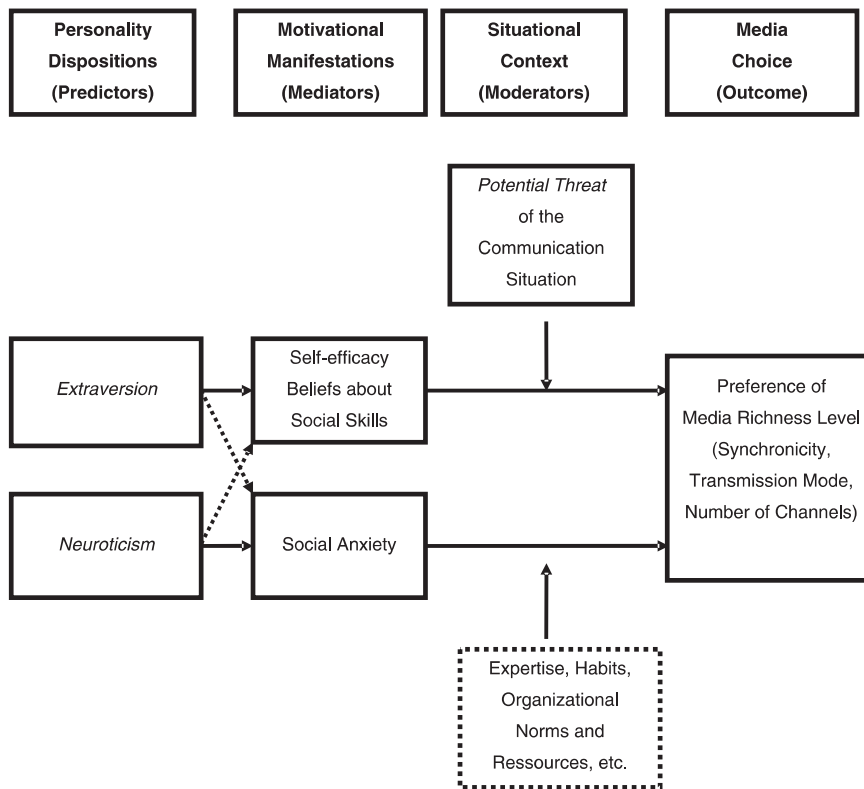


Figure 1. Conceptual model of personality effects on media choice.

Note: A dotted frame indicates that these moderators are part of the theory but were not included in our study.

## Method

### Design, Participants, and Procedure

The proposed hypotheses were tested in a questionnaire study that followed a mixed design. Personality traits as predictors (Extraversion, Neuroticism) and motivational manifestations as mediators (social skills, social anxiety) were measured as continuous variables. Potential threat of a communication situation as moderator was manipulated experimentally (low vs. high), while media preferences as the dependent variable was measured for two different communication media (face-to-face conversation and e-mail) that varied in terms of media richness (i.e., synchronicity, transmission mode, and number of channels).

Two separate subsamples took part in this study. Participants in the first subsample ( $n = 99$ ) were predominantly students, located on the campus of the University of Kiel, Germany. They were asked to complete a conventional paper-and-pencil version of the questionnaire. Participants in the second subsample ( $n = 129$ ) were recruited via the Internet and completed an online version of the questionnaire. These participants were living all across Germany, and in this subsample 57% were students. A thorough com-

parison of the two subsamples (reported in Hertel, Naumann, Konradt, & Batinic, 2002) revealed virtually no differences on the main variable measures both in terms of mean scores and standard deviations, and in terms of scale reliabilities. Thus, the two subsamples were combined in subsequent analyses (total  $N = 228$ ). The pattern of results reported below was virtually identical in both subsamples. As such, the data can be taken as representing a main study and a replication of the general results. However, because of power issues for some of the more sophisticated analyses (e.g., the mediation analyses) we chose to document the results based on the combined data set.

Participants in both subsamples first completed personality scales measuring Extraversion and Neuroticism, as well as perceived social skills and social anxiety. Participants then indicated their preferences for different communication media in two different communication situations. The aforementioned aspects of media richness (synchronicity, transmission mode, number of channels) were varied within subjects by asking participants to indicate their preference for face-to-face conversation (high richness level) and for e-mail communication (low richness level).<sup>2</sup> Potential threat of the communication situation was varied within subjects by asking participants first to indicate their

<sup>2</sup> For exploratory reasons, preferences were also measured for other communication media (IRC chat, video-conferencing, etc.). However, we chose to restrict these analyses to face-to-face conversation and e-mail for reasons of conceptual clarity. Also, ratings for some of the media (e.g., IRC chat) suffered from missing data.

media preferences for simple communication situations with low potential threat (“Please imagine chatting with a colleague about the last weekend, planning a party, etc.”) and then for communication situations with high potential threat (“Please imagine you are angry about the egoistic behavior of a colleague, or having to argue with an unfriendly colleague, etc.”).

## Measures

### Personality Traits

To assess Extraversion and Neuroticism we used items from the German version of the NEO-FFI (Costa & McCrae, 1992) by Borkenau and Ostendorf (1993). However, only the paper-and-pencil sample answered the complete set of 12 items per scale. In the Internet version, we restricted the overall length of the questionnaire to 70–80 items to avoid too many drop-outs (Ployhart, Weekly, Holtz, & Kemp, 2003). Thus, for the Internet version we selected the three items from each scale with the highest item-total correlations.

### Perceived Social Skills and Social Anxiety

Self-efficacy beliefs about personal social skills were measured using a subscale of the German self-monitoring scale by Nowack and Kammer (1987). The Internet sample answered a reduced version of the scale, this time including the five items with the highest item-total correlations. The paper-and-pencil sample answered the whole set of nine items. Social anxiety was measured using a subscale from Merz’s (1986) German scale of dispositional self-consciousness. Again, the paper-and-pencil sample answered all 12 items, whereas the Internet version of the survey contained only the five items with the highest item-total correlations.

### Media Preferences Ratings

Preferences for e-mail (low media richness) and face-to-face conversation (high media richness) were indicated by participants on an 8-point scale ranging from 0 (*not at all*) to 7 (*very much*) separately for the low- and the high-threat situations. Together, four preference ratings were obtained from each participant.

## Results

### Scale Reliabilities

#### Big Five Dimensions

For the shortened scales measuring Extraversion and Neuroticism, the resulting reliabilities (Cronbach’s  $\alpha = .60$  for Extraversion and  $\alpha = .65$  for Neuroticism) were satisfactory considering the limited number of items. With regard to the paper-and-pencil sample, the bivariate correlations between scores obtained from the complete 12-item set and the 3-item version were  $r = .81$  for Extraversion and  $r = .88$  for Neuroticism.

#### Perceived Social Skills and Social Anxiety

For perceived social skills, internal consistency for the overall sample was acceptable (Cronbach’s  $\alpha = .69$ ). Similarly, the internal consistency of the social anxiety scale for the overall sample was satisfactory as well (Cronbach’s  $\alpha = .81$ ). In the paper-and-pencil-sample, both short scales had high correlations with their respective full scales ( $r = .90$  for perceived social skills and  $r = .91$  for social anxiety; see Hertel et al., 2002, for a more detailed analysis of scale properties).

### Intercorrelations Among the Personality Traits

As expected, both NEO-FFI dimensions showed their strongest bivariate correlations with their respective behavioral subsets. The correlation between Extraversion and social skills was  $r = .38$ ,  $p < .001$ , and the correlation between Neuroticism and social anxiety was  $r = -.47$ ,  $p < .001$ ; Table 1. Additionally, perceived social skills and social anxiety showed a considerable negative correlation,  $r = -.49$ ;  $p < .001^3$ .

### Effects of Situational Threat and Media Richness: Repeated Measures ANOVA

A 2×2 repeated measures ANOVA demonstrated a main effect for both situational threat and media richness on media preference, as well as a significant interaction. First, the main effect of media richness revealed that respondents generally preferred high-richness media (face-to-face conversation, mean preference  $M = 6.40$ ) over low-richness media (e-mail,  $M = 3.86$ ),  $F(1, 227) = 317.87$ ,  $p < .001$ ,  $\eta_p^2 = .583$ . Second, the main effect of situational threat indi-

<sup>3</sup> Moreover, a confirmatory factor analysis of the items related to Extraversion, Neuroticism, social skills, and social anxiety showed a satisfactory fit for the four constructs. These results are available from the first author upon request.

**Table 1.** Means and standard deviations of extraversion, neuroticism, perceived social skills and social anxiety, and scale correlation scores

		<i>M</i>	<i>SD</i>	1	2	3	4
1	Extraversion	3.77	0.64	(.60)			
2	Neuroticism	2.47	0.85	-.33**	(.65)		
3	Perceived social skills	2.95	0.69	.38**	-.23**	(.69)	
4	Social anxiety	2.79	0.82	-.27**	.47**	-.49**	(.81)

Notes: Values on the diagonal represent scale reliabilities of the short versions of the subscales (*N* between 220 and 226 because of missing values). \*\* $p < .01$ .

cates that respondents generally preferred communication in nonthreatening situations ( $M = 5.77$ ) over communication in threatening conflict situations ( $M = 4.57$ ),  $F(1, 227) = 241.23$ ,  $p < 0.001$ ,  $\eta_p^2 = .515$ . Third, in accordance with MRT, a significant interaction between media richness and situational threat confirmed that the richer medium (face-to-face conversation) was more strongly preferred in conflict situations compared to nonconflict contexts,  $F(1, 227) = 23.46$ ,  $p < .001$ ,  $\eta_p^2 = .094$ .

## Effects of Personality Variables

### Analytical Design

The study design contained a within-subjects manipulation of both situational threat and media richness. Two orthogonal within-subjects contrasts representing the main effects of media richness (i.e., face-to-face conversation vs. e-mail) and situational threat (i.e., conflict vs. no-conflict) were calculated (Judd, McClelland, & Culhane, 1995, or Maxwell & Delaney, 2004, for a description of the analysis for 2x2 repeated measures designs). In essence, the contrast representing the effects of media richness is equivalent to a difference score between the communication preferences in high- vs. low-richness conditions. Similarly, the contrast representing the interaction of media richness and situational threat is equivalent to a difference score between difference scores, thus, modeling a 2x2 interaction.

In order to test the expected effects of personality variables, we conducted regression analyses for the two orthogonal within-subjects contrasts representing the effects of media richness, and the interaction of media richness and situational threat. Predictors in the regressions were the two personality variables of Extraversion and Neuroticism. Both predictors, as well as the mediator variables, were centered prior to regression. This allows for better interpretation of the regression coefficients as effects when all other predictors are at their mean (Jaccard, Turrisi, & Wan, 1990).

### Regression Analyses of the Media Richness Contrast

To explore the effect of Extraversion and Neuroticism on the preference for rich media, both bivariate and multiple

regression analyses were performed. With respect to the bivariate analyses, regressing the contrast representing media richness on Extraversion yielded an additional ( $R^2 = 0.047$ ) and significant effect in explaining the strong preference for rich media,  $F(1, 226) = 11.22$ ,  $p = .001$  (Table 3, first regression analysis). Specifically, extraverted participants preferred rich media more strongly than introverted participants ( $\beta = .22$ ,  $p = .001$ ), thus, supporting hypothesis H1a. In accordance with hypothesis H2a, this pattern was reversed for participants scoring high on Neuroticism: Participants high on Neuroticism had a lower preference for rich media ( $\beta = -.13$ ,  $p < .05$ ) than participants low on Neuroticism. This effect was significant,  $F(1, 226) = 4.03$ ,  $p < .05$ , but smaller ( $R^2 = .018$ ) than the effect for Extraversion (Table 2, second regression analysis).

The relative importance of Extraversion and Neuroticism when both are considered simultaneously in the same analysis was determined in a multiple regression analysis (Table 2, third regression analysis). Regressing the contrast representing media richness on Extraversion and Neuroticism simultaneously, however, did not explain significantly more variance ( $R^2 = .051$ , adjusted  $R^2 = .044$ ) than the regression on Extraversion alone. Consequently, the effect of Extraversion in this analysis was significant ( $\beta = .20$ ,  $p < .001$ ), whereas the effect of Neuroticism was not ( $\beta = -.07$ ,  $p = .35$ ).

### Regression Analyses of the Interaction Contrast

In order to test whether the effects of personality factors on the preference for rich media were additionally moderated by situational threat, we regressed the within-subjects contrast representing the interaction of situational threat and media richness on Extraversion and Neuroticism. First, Extraversion as sole predictor in a bivariate regression had an additional ( $R^2 = .058$ ) and significant effect in explaining the interaction of media richness and situational threat,  $F(1, 226) = 13.85$ ,  $p < .001$  (Table 4, first regression analysis). As expected in Hypothesis H1c, extraverts compared to introverts preferred rich media even more strongly in potentially threatening situations ( $\beta = .24$ ,  $p < .001$ ).

Second, regressing the contrast representing the interaction of media richness and situational threat on Neuroticism also yielded an additional ( $R^2 = .037$ ) and significant effect,  $F(1, 226) = 8.73$ ,  $p < .01$ . Participants scoring high

Table 2. Summary of regression analyses of the media richness contrast ( $N = 228$ )

Variables	<i>b</i>	SE <i>b</i>	B	<i>t</i>
Bivariate regression on Extraversion ( $R^2 = .047$ )				
Constant	2.52	0.14		18.15***
Extraversion	0.73	0.22	.22	3.35***
Bivariate regression on Neuroticism ( $R^2 = .018$ )				
Constant	2.52	0.14		17.89***
Neuroticism	-0.34	0.17	-.13	-2.01*
Multiple regression ( $R^2 = .051$ )				
Constant	2.52	0.14		18.12***
Extraversion	0.66	0.23	.20	2.82**
Neuroticism	-0.17	0.18	-.07	-0.94

Notes: Unstandardized regression constants indicate the main effect of media richness in relation to the original eight-point scale used in the study, whereas the respective *t*-values mirror the main effect of media richness found in an ANOVA analysis. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p = .001$ .

Table 3. Summary of regression analyses of the interaction contrast ( $N = 228$ )

Variables	<i>b</i>	SE <i>b</i>	B	<i>t</i>
Bivariate regression on Extraversion ( $R^2 = .058$ )				
Constant	0.51	0.10		4.89***
Extraversion	0.61	0.16	.24	3.72***
Bivariate regression on Neuroticism ( $R^2 = .037$ )				
Constant	0.51	0.10		4.85***
Neuroticism	-0.37	0.12	-.19	-2.96**
Multiple regression ( $R^2 = .071$ )				
Constant	0.50	0.10		4.89***
Extraversion	0.50	0.17	.20	2.88**
Neuroticism	-0.24	0.13	-.13	-1.82#

Notes: Unstandardized regression constants indicate the interaction effect of media richness and potential threats in the communication situation in relation to the original eight-point scale used in the study. Again, the associated *t*-values mirror the interaction effect found in an ANOVA analysis. #  $p < .05$ , one-tailed. \*\* $p < .01$ , two-tailed. \*\*\* $p < .001$ , two-tailed.

on Neuroticism again reported less preference for rich media in threatening situations ( $\beta = -.19$ ,  $p < .01$ ) than respondents low on Neuroticism, which is consistent with Hypothesis H2c (Table 3, second regression analysis).

Third, the relative importance of Extraversion and Neuroticism were determined in a multiple regression analysis. In this analysis, we regressed the within-subjects contrast representing the interaction of situational threat (conflict vs. no conflict) and media richness (face-to-face communication vs. e-mail) on Extraversion and Neuroticism simultaneously. The multivariate model ( $R^2 = .071$ , adjusted  $R^2 = .064$ ; Table 4 third regression analysis) explained significantly more variance than either the bivariate regression on Extraversion,  $\Delta R^2 = .013$ ,  $F(1, 226) = 2.98$ ,  $p = .05$  (directional test), or the bivariate regression on Neuroticism,  $\Delta R^2 = .034$ ,  $F(1, 226) = 7.95$ ,  $p < .01$ . Both personality traits had unique effects on the explanation of preference for rich media in more difficult and potentially threatening situations, which is also reflected in their respective partial correlations with the contrast representing the interaction of situational threat and media richness ( $r_p = .19$  for Extraversion, and  $r_p = -.12$  for Neuroticism). Overall, the pattern of results in this analysis strongly resem-

bles the results obtained in the bivariate regression analyses. Regression coefficients were slightly lower (Table 3), but still significant ( $\beta = .20$ ,  $p < .01$  for Extraversion;  $\beta = -.13$ , one-sided  $p < .05$  for Neuroticism), further supporting hypotheses H1c and H2c.

To explore the nature of personality effects on the contrast representing the interaction of media richness and situational threat in more detail, we performed separate analyses for the two experimental levels of situational threat (conflict vs. no conflict). Analogous to the computation of within-subjects contrasts for the main effects, difference scores representing the different preferences for media with high vs. low richness were calculated separately for threatening and nonthreatening situations. Thus, these two scores represent the simple effects of media richness within each level of situational threat. Finally, both difference scores were regressed on Extraversion and Neuroticism in separate multiple regressions.

Neither Extraversion ( $\beta = .05$ ,  $p = .48$ ) nor Neuroticism ( $\beta = .03$ ,  $p = .68$ ) affected the preference for rich media in the nonconflict condition, and the explained variance was negligible ( $R^2 = .002$ ). There were, however, significant



Table 4. Mediation of the effects of extraversion and neuroticism on the richness and interaction contrasts based on the path model results

Effect	Estimate	SE	95% CI	
			Standard normal	Bootstrap percentile
Effects on richness contrast				
Extraversion				
Direct	0.16	0.08	(0.01, 0.30)	(0.02, 0.32)
Indirect via social skills	0.03	0.02	(-0.02, 0.07)	(0.00, 0.08)
Indirect via social anxiety	0.01	0.01	(-0.01, 0.03)	(0.00, 0.05)
Neuroticism				
Direct	-0.00	0.05	(-0.09, 0.91)	(-0.18, 0.00)
Indirect via social skills	-0.01	0.01	(-0.03, 0.01)	(-0.04, -0.00)
Indirect via social anxiety	-0.05	0.03	(-0.12, 0.01)	(-0.14, -0.07)
Effects on interaction contrast				
Extraversion				
Direct	0.16	0.06	(0.04, 0.29)	(0.04, 0.29)
Indirect via social skills	0.01	0.01	(-0.02, 0.04)	(0.00, 0.06)
Indirect via social anxiety	0.02	0.01	(-0.00, 0.05)	(0.00, 0.06)
Neuroticism				
Direct	-0.02	0.05	(-0.13, 0.08)	(-0.20, 0.00)
Indirect via social skills	-0.00	0.01	(-0.02, 0.01)	(-0.03, -0.00)
Indirect via social anxiety	-0.10	0.04	(-0.17, -0.03)	(-0.18, -0.03)

Note. Bootstrap percentiles are based on a multivariate adaptation of the procedure suggested by Shrout and Bolger (2002); 1000 bootstrap samples with 228 cases each.

effects for both personality variables in the conflict condition. In the multiple regression analysis, Extraversion had a significant positive effect ( $\beta = .23, p = .001$ ) on the preference for rich media, whereas Neuroticism had a marginally significant negative effect ( $\beta = -.11, p = .06$  for a directional test). Figure 2 illustrates the joint effects of Extraversion and Neuroticism on the preference for rich media in both levels of situational threat.

Similar to the regression analyses of the interaction contrast, the follow-up analyses of partial difference scores demonstrate that the effects of personality variables on the contrast representing the interaction of media richness and situational threat is results from both a preference (for Extraversion; H1c) and avoidance (for Neuroticism; H2c) of rich media in complex and threatening situations. In the final analysis, we explored mediating factors of these effects in a multivariate path model.

### Complete Path Model and Mediation Analyses

In order to test the mediating effects of perceived social skills and social anxiety, we developed and tested a multivariate path model. Unlike results from a longitudinal design, results based on cross-sectional data cannot establish causal effects. A test of the path model indicates, however, whether or not the proposed mediating effects are consistent with the empirical data. The path model incorporated Extraversion and Neuroticism as predictors, perceived social skills

and social anxiety as mediators, and both the media-richness contrasts and the interaction contrast as outcomes. Statistical tests of direct and indirect effects of Extraversion and Neuroticism were performed using bootstrapping (Table 4).

Results of this analysis are illustrated in Figure 3. In the multivariate analysis, Extraversion had significant direct effects on both the richness contrast ( $\beta = .16, p < .05$ ) and the interaction contrast ( $\beta = .16, p < .05$ ), mirroring results from the multiple regression analyses. It also significantly predicted perceived social skills ( $\beta = .33, p < .001$ ), and, less strongly, social anxiety ( $\beta = -.11, p < .05$ ). The effect of perceived social skills on both the richness contrast ( $\beta = .08, p = .06$  for a directional test) and the interaction contrast ( $\beta = .03, p > .05$ ) were weak or negligible. The resulting indirect effects of Extraversion are not significant, as indicated by the confidence intervals in Table 4. Thus, in contrast to H1b, the significant effect of Extraversion on the preference for rich media was not mediated by perceived social skills.

In contrast, Neuroticism had no significant effects on the richness contrast ( $\beta = -.00, p > .05$ ) or the contrast representing the interaction of media richness and situational threat ( $\beta = -.02, p > .05$ ). It did, however, substantially predict social anxiety ( $\beta = .45, p < .001$ ), which in turn predicted the interaction contrast ( $\beta = -.22, p < .01$ ). Together, Neuroticism yielded a significant indirect effect on the interaction contrast via social anxiety ( $\beta_1 \times \beta_2 = -.10, p < .05$ ; Table 4). Thus, the multivariate analysis confirms

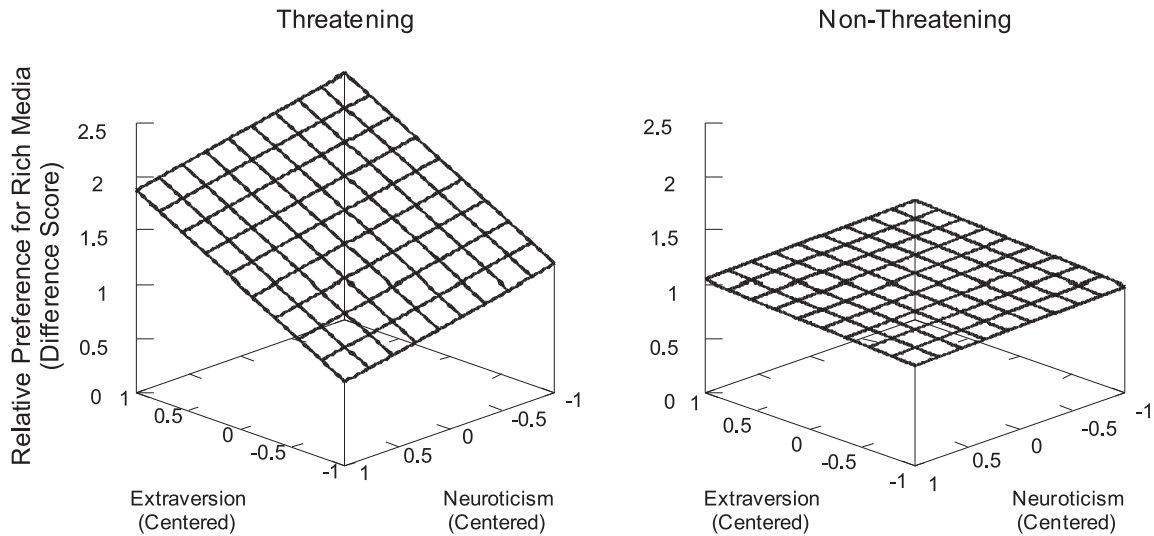
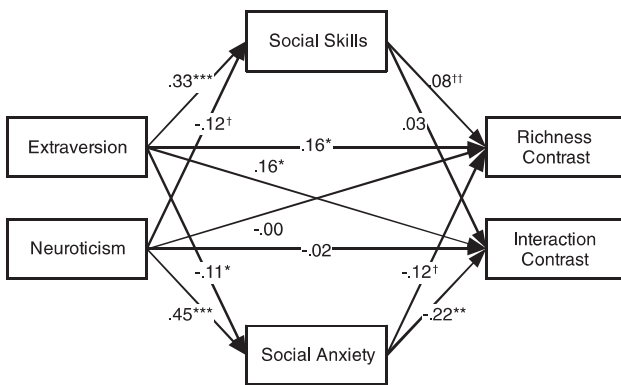


Figure 2. Relative preference for rich media in threatening (conflict) vs. nonthreatening situations as predicted by Extraversion and Neuroticism.



†† $p = .06$ , directional test. † $p < .05$ , directional test. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

Figure 3. Path model of the direct and indirect effects of Extraversion and Neuroticism on the preference for rich media as well as on the interaction of media richness and potential threats in the communication situation.

that the effect of Neuroticism on the preference for rich media in threatening situations was, in fact, mediated by social anxiety, supporting H2b.

## Discussion

Current technological developments, and particularly the invention of the Internet, have significantly increased the number of communication media available (Walther, 1996; Wood & Smith, 2005). Previous research on media preferences predominantly considered external or situational factors (e.g., Carlson & Zmud, 1999; Dennis & Valacich, 1999; Daft & Lengel, 1986; Rice, 1993; Treviño et al.,

2000; Walther, 1992). The main contribution of the present paper is that communication media preferences are also a function of stable personality dispositions (of the users) and related motivational manifestations in social situations. Building on MRT as, perhaps, the most prominent approach in this field, we argued that the richness of communication media (i.e., synchronicity, transmission mode, and number of channels) not only has implications for the efficiency of information exchange, but also for the needs and fears of the users as a function of more general personality dispositions. More specifically, we argue that the preferences for communication media should be partly determined by their potential to fulfill specific interests and needs of the user, which are connected to their personality structure. The potential of a communication medium to fulfill these interests and needs is determined by its richness level, and the effects of personality on media preferences should be more visible in situations that correspond to the motivational implications of the personality trait.

Consistent with these expectations, the reported results revealed that Extraversion and Neuroticism were significantly correlated with media preferences. Extraverts and participants low on Neuroticism more strongly preferred media with high-richness levels (face-to-face communication compared to e-mail) than introverts and individuals high on Neuroticism. As documented by the scores of the constant terms in Table 3, the additional effects of these personality dispositions are of similar strength as the general interaction effect between media richness and situational threat. Also consistent with our expectations, the effects of Extraversion and Neuroticism were at least partly mediated by perceived social skills and social anxiety as motivational manifestations of the more general traits. Thus, extending prior research (Jackson et al., 2003; Joinson, 2004; Stritzke et al., 2004; Tuten & Bosnjak, 2001),

the current study not only demonstrated significant relationships between personality traits and media preferences, but also provided data on psychological processes that explain the observed intercorrelations in the context of a multilevel approach to personality. Consistent with our expectations, the effects of Extraversion on media preferences were predominantly mediated by perceived social skills, while the effects of Neuroticism were predominantly mediated by social anxiety. Moreover, the results also confirmed the assumption that the investigated personality traits do not correspond with preferences to communicate per se, but rather with preferences for certain ways of communication. Thus, the observed personality effects seem to be specific to media preferences, but not to more general activity preferences (e.g., Furnham, 1981).

Further contributing to a deeper understanding of the underlying dynamics of media preferences, the data confirmed our hypothesis that the personality effects were moderated by situational triggers of the motivational processes. Consistent with our assumption that media preferences are determined by people's interests and fears in a given situation, significant personality effects were particularly observed in scenarios that require high social skills and entail high social threat (social conflicts). In contrast, when challenges and potential threat of a communication situation were low, no significant personality effects occurred. This moderation is consistent with other findings (Joinson, 2004) and further underscores the functional aspects of media preferences and their interplay with personality dispositions. Finally, in addition to the observed support for our hypotheses, the results also provide information on the relative impact of the two explored personality traits. In the final integrative analyses, the effects of Extraversion were clearly stronger than the effects of Neuroticism ( $\beta = .20$  vs.  $\beta = -.13$ ).

Together, this study adds to existing knowledge in several respects. First, the study is one of the first empirical explorations of personality effects on communication media preferences. Focusing on Extraversion and Neuroticism, the study explored the most influential ("classic") personality traits in the context of activity preferences (Furnham, 1981). Moreover, in addition to correlational analyses between single personality scales and media preferences, our work is embedded in a multilevel approach to personality in which effects of general traits are considered to be mediated by their motivational manifestations. The reported empirical data are consistent with such an approach as well as with the assumed moderation by the potential social threat within a situation. Please note that given the high similarity of findings both in the paper-and-pencil and Internet-based subsamples, the general pattern of results can be considered as quite robust. Finally, the integration of personality approaches and MRT connects two lines of research that have been rather isolated from one another. Additionally, motivational aspects of media preferences, such as perceived self-efficacy and need for control, were considered in addition to economic and rational aspects of media use.

In terms of practical implications associated with the reported results, Extraversion and Neuroticism should be considered jointly with their motivational manifestations when communication media preferences play a role. For instance, human resource representatives might consider personality aspects together with the communication media given when they select employees for tasks with high conflict potential (e.g., service or controlling personnel). Moreover, supervisors might consider personality-related needs and fears of an employee when this person has to be confronted with difficulties at work. In general, when the communication content is rather critical and one wishes the communication partner to feel comfortable, extraverts and people low on neuroticism are perhaps better approached via rich media (e.g., face-to-face communication) while introverts and persons high on Neuroticism might sometimes prefer media with a lower richness level (e.g., e-mail).

Before concluding, a number of limitations and questions for further research should be mentioned. First, the current study only focused on two communication media that clearly differed in the three considered aspects of media richness. Replications are desirable that not only explore personality effects on other communication media (phone, fax, video-conferencing, etc.), but also vary the different aspects of richness (synchronicity, transmission mode, number of channels) more systematically. Potential results might show different intercorrelations between personality and the three aspects of media richness when measured separately, indicating different sensitivities of these aspects for motivational factors. Moreover, the media chosen in the current study also differ in other aspects, such as novelty or level of technology, thus, somewhat confounding media richness with other constructs. Future research is desirable to disentangle these aspects.

In a similar way, although Extraversion and Neuroticism may be the most central personality traits in the context of activity preferences (Amichai Hamburger & Ben-Artzi, 2000; Furnham, 1981), it might be interesting to include other trait concepts as well (e.g., Jackson et al., 2003; Joinson, 2004; Sheeks & Birchmeier, 2007; Stritzke et al., 2004; Tuten & Bosnjak, 2001). For example, trait-like computer-specific anxiety might further influence media preferences (Beckers & Schmidt, 2001) and explain gender differences in media usage patterns (Chua, Chen, & Wong, 1999). However, future studies should also consider potential mediators and moderators (such as situational threat, level of prior media experience, etc.) in order to better understand the underlying psychological dynamics.

The main criteria measures in this study were ratings of media preferences for hypothetical work-related communication scenarios. Further research is necessary to replicate these findings in real communication settings, considering measures of experienced stress, satisfaction, and communication efficiency in addition to media choices and media change. Moreover, research in different contexts with different norms of media use (e.g., work and nonwork

contexts) might be considered as a further extension. However, given the robustness of our findings in a rather simplistic setting, we are quite optimistic that similar or even stronger effects of personality dispositions on media preferences should occur in more complex field settings.

### Authors' Note

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