turalt

the technology of empathy

email edge™ technical report

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Contents

Overview

Email is a fundamental part of how we communicate in today's workplaces. A typical employee may spend up to 28% hours of a working week, (e.g., (Institute et al., 2012)), composing and reading email, such as co-ordinating, delegating and sharing tasks. A typical medium-sized company will invest millions of dollars a year in employee time into email communication.

However, despite the very clear return on investment from improving people's use of email in the workplace, there is little in the way of training to support people's use of email in the workplace. And what there is, is typically generic guidance on etiquette rather than focused, personal, training on how to improve practice.

At turalt, we believe that people in modern workplaces deserve better, and that technology can enhance empathy. We have over 25 years experience working as cognitive scientists in the learning sector, and that experience has enabled us to develop Email Edge™, a groundbreaking psychometric test that can help support email training, as well as many other aspects of interpersonal communication in the workplace.

Email Edge takes about fifteen minutes to measure and generate a fully-personalized report including a custom action plan. It is specifically designed to measure not just the personal traits that influence the way people write and perceive each other through the medium of email, but to measure behaviour through carefully constructed scenarios that elicit actual responses.

A complete report based on the email edge psychometric provides an invaluable basis for email training, for both individuals and teams.

Intended use

Email Edge is intended to be used as a reflective tool in support training for interpersonal communication, especially with email in the workplace.

Email Edge is not intended to be used as a source of employment criteria or credentialing. The report which supports the test results does make recommendations and suggestions, particularly through its personalized action plan. While these recommendations are intended to assist with personal development planning, they should not be interpreted as indicating areas of concern.

It is also not designed as a measure of personality. While there is evidence that personality traits do affect email perception (e.g., Boland & Queen, 2016; Kruger, Epley, Parker, & Ng, 2005; Shen, Brdiczka, & Liu, 2013), personality is focused more on relatively stable aspects of the way people behave. This makes it less amenable to support through training.

Test design and evaluation

The **email edge™** email psychometric instrument currently consists of three parts, each measuring a different aspect of people's reading, writing, and perception of email communication in the workplace. The overall instrument structure is as follows:

- 36 self rating items, measuring six distinct traits.
- 6 email response items, using a selection task with five or six pairs of response fragments per item to measure email writing preferences. These items simulate people writing an email in a number of typical workplace scenarios.
- 6 email rating items, measuring perception of six different emails representing typical workplace scenarios, each measured on six common rating scales.

Self rating items

The self rating part of the instrument measures the following six characteristics:

- **Assertiveness** is a measure of how easily people can communicate without either aggression or passivity. People who are higher in assertiveness find it easier to communicate their point of view in a self-assured way, where people who are lower in assertiveness may feel a need to be more defensive. This is important to email as assertiveness improves clear communications.
- **Compliance** measures how people respond to authority. People who are higher in compliance will tend to accept requirements from others, where people who are lower in compliance will tend to reject authority. This is important in email because it affects how people react to messages which require action.
- **Empathy** is a measure of how well people can understand or imagine what others are thinking or feeling. People who are high in empathy find it easier to read other people's motivations and behaviours, and use that to guide their actions. Empathy is particularly important in email because people don't see each others' body language or reactions, and the cues in their writing may be very subtle.
- **Expressiveness** is a measure of how easily people share how they are thinking and feeling. People who are more expressive are more likely to be open in their communication, people who are less expressive are be more reserved in their interactions with others. In email, this influences group communications, as it enables teams to have a better understanding of each other.
- **Flexibility** is somewhat awkwardly named, but it is perhaps best described as a measure of how well people embrace new challenges. Those who are higher in flexibility find it more natural to seek out new experiences, where those who are lower need a little more time and energy to adjust to change. Flexibility is important to many aspects of work (Bond & Flaxman, 2006), not just email, for example it is a good indicator of how stressed people might become.

- **Self-consciousness** is a measure of how people feel in group settings. People who are higher in self consciousness may be quieter and less likely to bring forward their opinions in new and unfamiliar situations, where those who are lower may feel less inhibited in saying what they think.

All of these characteristics vary widely depending on subtleties of the situation, such as how well people know one another. Also, they are not behaviours, they are more a description of how easy or natural those behaviours are. With training or practice, it is certainly possible for someone who is not naturally assertive or flexible to become better at these skills. They will just find it harder than others who are more natural.

Although some of these traits are associated with personality characteristics, email edge™ is not focused on personality, but on the factors which influence interpersonal communication and interaction, especially in the workplace. Where personality traits are relatively stable and relatively hard to improve through training, email edge™ takes a different strategy, and focuses on characteristics which influence workplace communication, but which are also relatively easy to work on with training.

Cronbach's alpha estimates of reliability for these six factors are shown in Table 1.

Table 1: Cronbach's alpha for each factor (n = 1121)

Factor	Alpha
Assertiveness	0.8
Compliance	0.78
Empathy	0.76
Expressiveness	0.71
Flexibility	0.76
Self-consciousness	0.85

A second measure to consider is the extent to which these characteristics are correlated. If the scores for any two sets of items are very highly correlated, then the items may actually be measuring the same underlying characteristics. A matrix of the correlations between items is shown in Table 2.

Table 2: Scale correlations (n = 1121)

	Assertiveness	Compliance	Empathy	Expressiveness	Flexibility
Compliance	-0.025				
Empathy	0.132	0.246			
Expressiveness	0.501	0.246	0.355		
Flexibility	-0.424	-0.223	-0.153	-0.576	

	Assertiveness	Compliance	Empathy	Expressiveness	Flexibility
Self-consciousness	-0.583	-0.218	-0.225	-0.756	0.699

Email response items

The second part of the email edge™ consists of six questions where participants are to asked to write an email message by choosing one of a sequence of paired text fragments. The fragments are designed to detect differences on two sets of scales: three factors selected from a model of emotional intelligence, and three factors selected from the SYMLOG® (Bales, 1950) model of group dynamics and interaction.

This is a novel item type for a psychometric instrument. Instead of using a rating scale, each alternative fragment may be scored on one (or more) of the scales, either as a positive value or as a negative value. See the example shown in Figure 1. The final score is then computed from the total score for each fragment associated with a given scale. Each fragment may be coded on several dimensions, consistently with the SYMLOG model (Bales, 1950).

The advantage of these items is that they are explicitly not personality-centred, and instead measure how people respond to realistic but carefully controlled scenarios. However, because these items are constructed to emphasise differences between individuals, reliability between individuals is not useful, and therefore measures like Cronbach's alpha are not appropriate. Instead, as predicted, there is only a slight agreement among participants within the email response items (Fleiss' kappa = 0.153, n = 1121). This is evidence that these items show no strong convergence on a set of predictable response choices within the sample group.

All message fragments used to build the email response items went through two rounds of a validation process (first with n = 100, second with n = 75), which also ensured that there was a reasonable within each pair. Any pair which was heavily skewed (with less that 10% of respondents choosing one side) was modified or eliminated.

The email response items measure behaviours on two distinct sets of factors, relating to emotional intelligence and to group interaction.

The email response items were assessed through item response theory models, initially using two parameters to model both individual and situational factors. These models showed reasonable robustness when based on different partitions of the data set, demonstrating elements of reliability. The challenge of these models, though, is that 2PL models cannot easily be tested, especially for construct validity, because they tend to fit to characteristics that the designers might not even be aware of.

The advantage of item response theory is that it allows individual instrument items to vary in the extent to which they reveal underlying traits, both according to the participant and according to the situation.

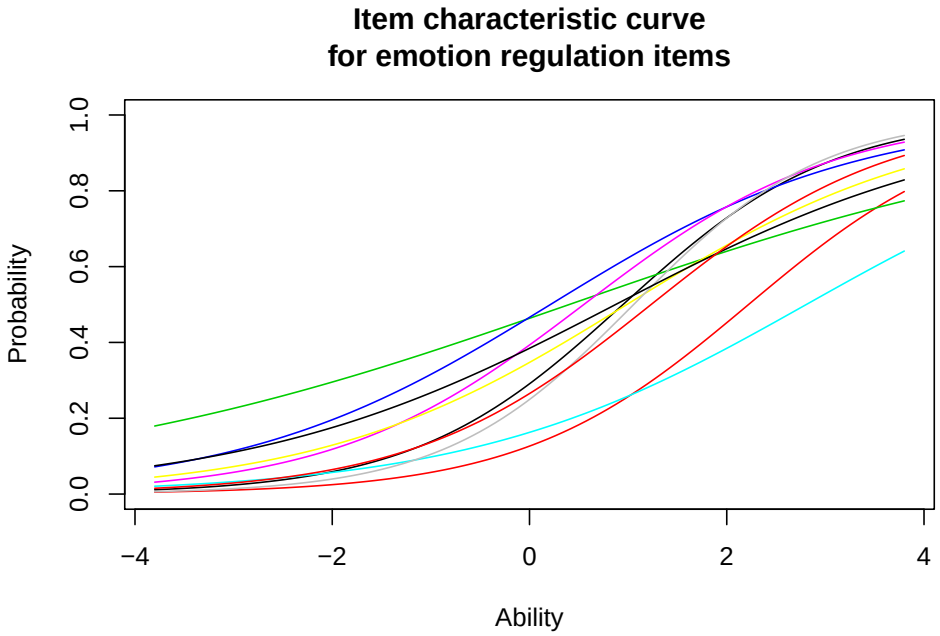
To ensure validity, we tested the item responses for an effect based on the self rating scales, whose reliability and construct validity have already been established. All six of the self rating factors showed a significant effect on the email response selections, in the case of three scales (assertiveness, compliance, and empathy) these effects were highly significant. Table 3 shows the probabilities of associations between the self rating scales and the email response patterns.

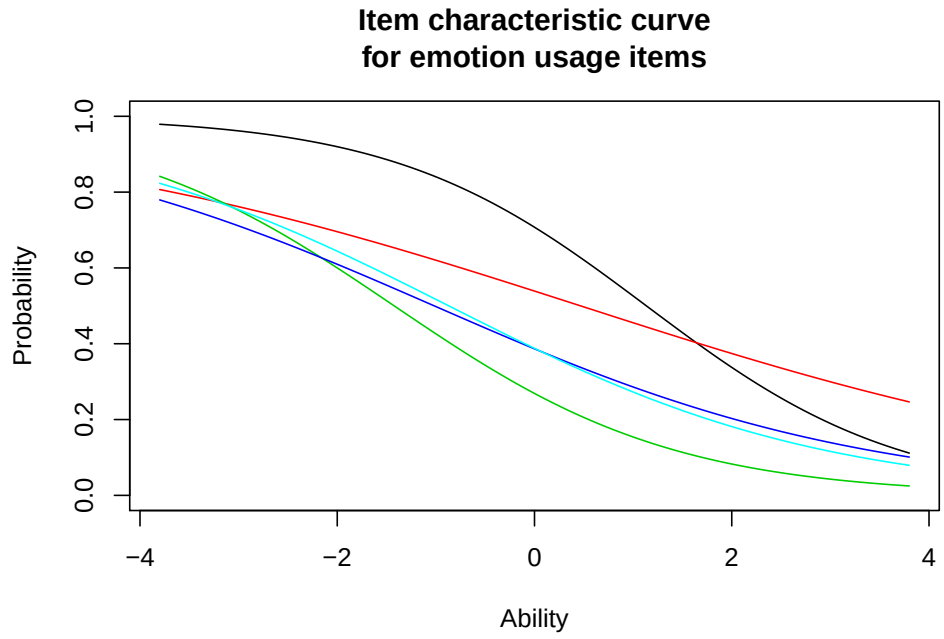
Table 3: Probability of association between self-rating and email responses

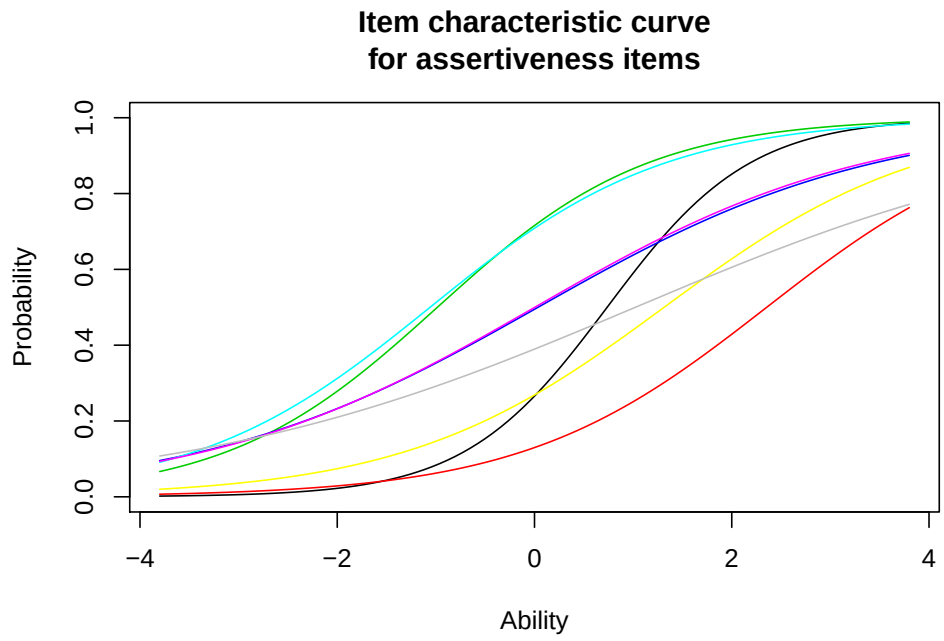
	Chi square	p
Assertiveness	128	3.67e-06
Compliance	121	2.1e-05
Empathy	207	6.24e-17
Expressiveness	90.8	0.0154
Flexibility	85.3	0.0391
Self-consciousness	99.1	0.00323

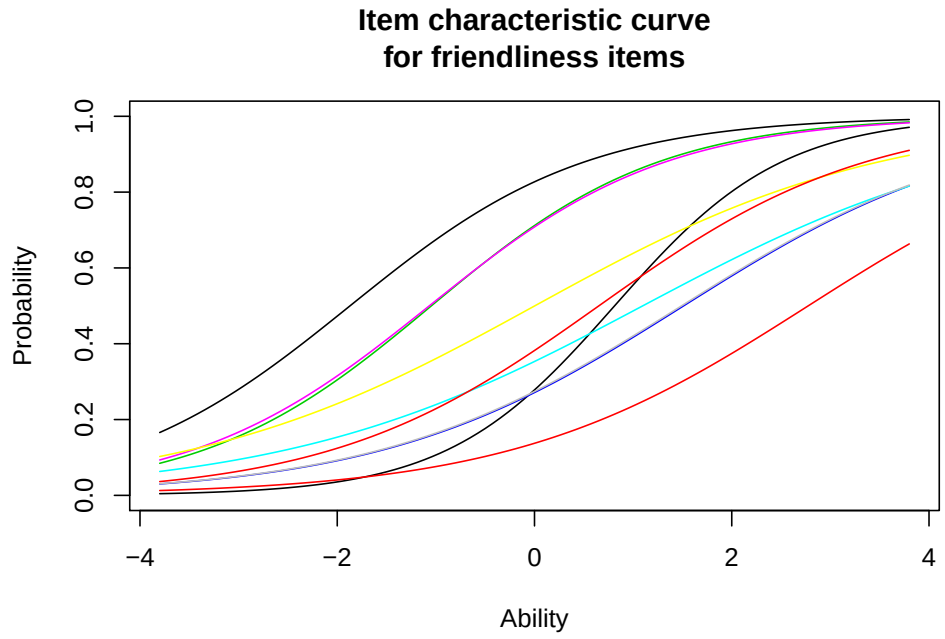
Item response theory uses a statistical technique called latent trait analysis, and essentially builds a model of the factors, both individual and item factors, that affect people's responses. This can be used with both rating scale items (polytomous variables) (like the email reaction items) and binary choices (dichotomous variables).

The following diagrams show the item characteristic curves for the four sets of items used to measure email response construction.









The diversity in sensitivities in each individual item is an important characteristic of these curves: this shows that the email items are not equally sensitive to the underlying factors.

Email rating items

The third part of the email edge™ instrument measures how people react to a range of realistic workplace emails. There are six messages, each of which corresponds to a scenario that is either confrontational or nonconfrontational. Participants rate each message on six different tone factors, which relate to either perception of emotion or perception of attitude. Table 4 shows the alpha estimates for these groups of items.

Table 4: Alpha and omega total for email rating items (n = 1121)

	Alpha	McDonald's omega total
Perception of attitude	0.75	0.82
Perception of emotion	0.77	0.84

Unlike the self rating items, which were explicitly designed to be unidimensional, the email rating items are situational, and, therefore, alpha alone is not a good metric of the internal consistency. In particular, the email scenarios are divided int two classes: confrontational and non-confrontational, which have a substantial effect on people's perception of attitude and emotion. A more detailed analysis of the internal structure of the email rating items using McDonald's omega with a Schmid Leiman transformation (Zinbarg, Revelle, Yovel, & Li, 2005)

showed that the email rating item structure is modelling these scenario classes and the internal structure effectively. The results from the factor loadings identified though the Schmid Leiman transformation are used as part of the dataset for the predictive reporting technology, in line with (Revelle & Zinbarg, 2008). For this reason, Table 4 includes McDonald's omega total (ω_t) estimates for the email items, as well as the conventional alpha estimates.

The email rating items are not only used in isolation. There are also strong associations between the email ratings and the self rating scores, although these are often specific to particular scenarios. These associations can be tested using a linear model for each scenarios email rating score against the self rating scores, and show a wide variety of scenario-specific effects, which are also used within the reporting technology.

Demographic differences

All analyses during the design and validation of the email edge™ were conducted with representative panels based on people who used in email in the workplace. The following tables show how the mean percentiles for each trait measured in the self rating items break down according to common demographic factors.

It is worth noting that while the mean percentile for an entire population will be 50, with traits which reflect learnable skills or other more malleable factors than typical personality traits, there are likely to be distinct differences by age or demographic backgrounds which are linked to differences in workplace life. It is important to consider these differences when interpreting an individual's results.

Table 5: Percentile means for traits by gender

	Female (n = 545)	Male (n = 576)
Assertiveness mean	46.3	53.5
Assertiveness std. deviation	28.3	28.9
Compliance mean	52.7	47.5
Compliance std. deviation	28.6	28.8
Empathy mean	53.8	46.5
Empathy std. deviation	28.6	28.5
Expressiveness mean	51.3	48.8
Expressiveness std. deviation	28.5	29.1
Flexibility mean	53.9	46.3
Flexibility std. deviation	28.4	28.8
Self-consciousness mean	52.5	47.7
Self-consciousness std. deviation	28.8	28.7

Table 6: Percentile means for traits by age band

	Under 21 (n = 78)	21 to 30 (n = 216)	31 to 40 (n = 324)	41 to 50 (n = 184)	51 to 60 (n = 152)	61 to 70 (n = 132)	Over 70 (n = 35)
Assertiveness mean	52.6	48.5	47.7	45.1	50.4	59.4	63.6
Assertiveness std. deviation	26	29.2	29.8	29	29.6	24.5	23.1
Compliance mean	50.2	49.5	50.3	50.5	50.9	49.4	45.9
Compliance std. deviation	26.3	29.6	28.9	28.3	29.1	29.7	28.6
Empathy mean	47.7	50.2	49.1	46.8	53.3	52.5	56.2
Empathy std. deviation	29.3	29.3	28.7	29.5	29.2	27.1	23.7
Expressiveness mean	47.6	47.3	47.7	49.3	54.4	55	59.7
Expressiveness std. deviation	26.6	29.3	29.6	28	31	26.3	20.6
Flexibility mean	64.9	56.2	49.9	47.2	48.5	40.1	38.3
Flexibility std. deviation	28.1	28.7	29.1	29.2	27.1	25.8	24.2
Self-consciousness mean	59.2	53.6	53.7	50.5	46	37.6	35.1
Self-consciousness std. deviation	27.1	28.6	29.6	29	28.4	25.1	20.1

Summary

The way people read and write email in the workplace is influenced by a range of psychological factors, some of which have been previously explored through a range of experimental and psychometric approaches (Boland & Queen, 2016; Kruger et al., 2005; Reinke & Chamorro-Premuzic, 2014; Shen et al., 2013). However, there is a substantial gap between the research literature and the practice of personal development in email communication, which remains rooted in etiquette, tips, and guidelines.

Email Edge bridges that gap by providing a sound, research-based, set of metrics that measure a range of individual characteristics that are linked to interpersonal communication and email use in the workplace. Email Edge profiles provide an innovative way to reflect on how people perceive each other's emails, and how they compose emails, specifically focusing on characteristics that are amenable to improvement through practice and training.

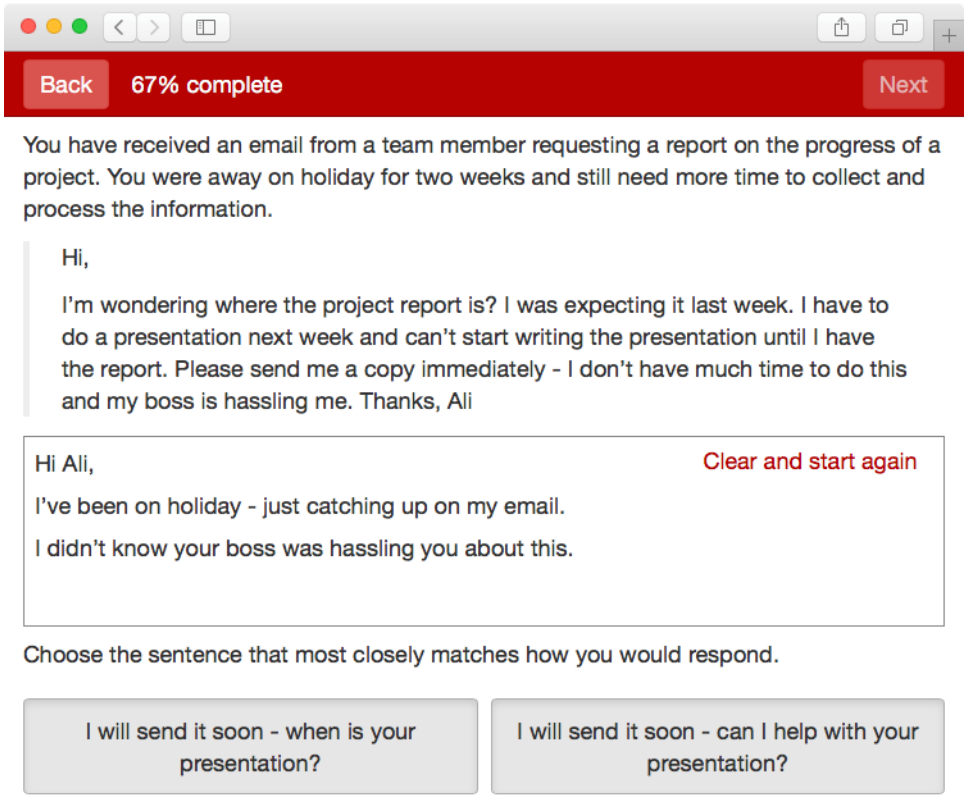


Figure 1: Example of an email response screen (not a real item)

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