Reduced Empathizing Skills Increase Challenges for User-Centered Design

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ABSTRACT
User-Centered Design is surprisingly difficult. One of the biggest issues, certainly for those with no HCI or usability experience, is a lack of appreciation of how users think and work. Their assumption is that users will approach and solve problems in the same way as the designers and developers of an interactive solution. Extreme examples of this self-as-user outlook is the belief that interaction problems are either the direct fault of users or the failure of users to follow instructions (the 'RTFM' syndrome [9]).

This paper explores a psychological explanation of the self-as-user outlook through Empathizing-Systemizing theory, including a large-scale study (n = 441) of men and women working in the Information Technology field. The study found that men whose role was technological had significantly lower empathizing scores. The results of the study help to explain the self-as-user outlook and how it needs to be overcome in the design process.

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User-centered design, empathy, designer behavior, social issues.

ACM Classification Keywords
H.5.2 User Interfaces (User-Centered Design).

INTRODUCTION

Empathizing-Systemizing Theory

Simon Baron-Cohen and his colleagues at the Autism Research Centre propose two major behavioral dimensions: empathizing and systemizing [3, 4]. Empathizing is concerned with people and the interactions between them while systemizing is centered on the physical world and causality. Their theory is used to explain significant psychological differences between men and women. It is also the basis for Baron-Cohen's Extreme Male Brain (EMB) model of autism and Asperger's syndrome (AS) [2].

In the EMB model, highly gifted scientists and engineers with AS are found to have strong systemizing behavior but at considerable expense to empathizing. They are recognized as having abnormal social and communicative development as well as a very narrow set of interests, among other traits.

The researchers have devised self-completion questionnaires (described in detail in [3, 4]) to measure systemizing and empathizing quotients, SQ and EQ respectively. On average, men have higher SQ scores than women while women have higher EQ scores than men. Furthermore, Baron-Cohen and his colleagues found a small but statistically significant negative correlation between SQ and EQ in the normal population.

Clearly, SQ is of great importance in the construction and understanding of information systems while EQ is equally important in dealing with the interaction between systems and users.

The purpose of the new study described here was to establish the extent to which SQ and EQ varied with respect to the job roles participants performed within the Information Technology (IT) industry and any implications this might have in user-centered design (UCD).

THE STUDY

Participants were recruited from a number of usability and web development email lists in the US and UK. They were requested to complete online versions of the EQ and SQ questionnaires, then to report their scores along with a simple index of their primary job role in IT (called the People-Technology index, abbreviated P-T). An index of 1 indicated a primarily *people*-oriented role such as technical author or usability specialist while an index of 5 indicated a purely *technical* role such as a software or web developer. Participants were also asked to indicate whether they were male or female. Since the EQ and SQ questionnaires were quite time-consuming to complete (about 15-20 minutes each), no further demographic information was collected.

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	People-Oriented		P-T		Tech-Oriented	Total
	1	2	3	4	5	
FEMALE (n)	60	78	75	49	23	285
Mean EQ	46.9	46.5	45.0	49.6	41.5	46.3
Mean SQ	30.2	32.5	37.1	42.8	38.3	35.4
MALE (n)	26	33	32	35	30	156
Mean EQ	44.1	42.0	42.2	32.8	31.3	38.3
Mean SQ	37.7	38.5	39.7	41.5	42.3	40.0
COMBINED (n)	86	111	107	84	53	441
Mean EQ	46.0	45.2	44.2	42.6	35.7	43.5
Mean SQ	32.4	34.3	37.9	42.3	40.5	37.1

Table 1. Mean *EQ* and *SQ* scores by *Gender* and *P-T*

RESULTS

A summary of results for the 441 participants is shown by gender and P-T in Table 1 (the People-Technology index is described above). Note that mean EQ scores are consistent with those found in the Baron-Cohen Study 1, for the normal population, referred to in this paper as 'controls' [4].

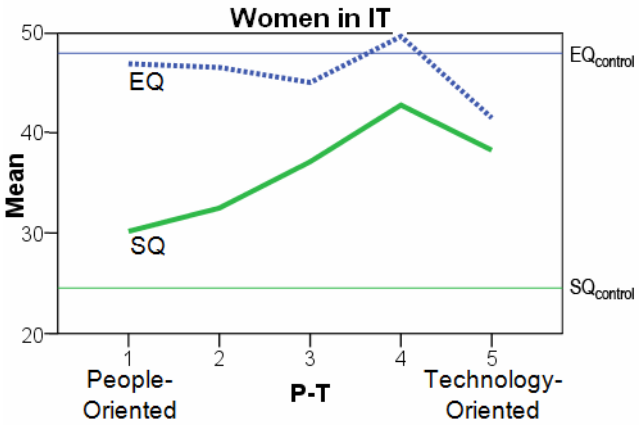

Figure 1. *EQ* and *SQ* by *P-T* for Women

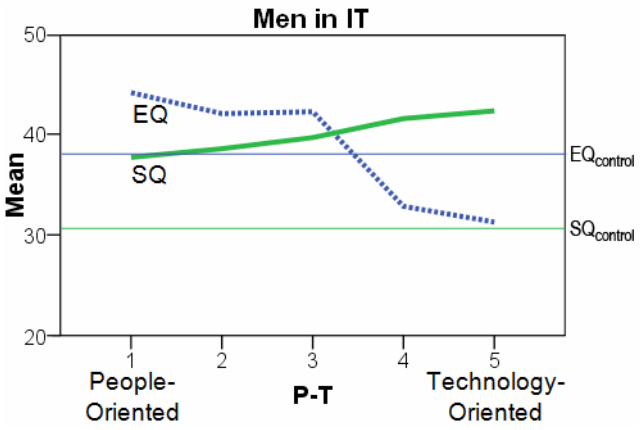

Figure 2. *EQ* and *SQ* by *P-T* for Men

Unsurprisingly, since all of the participants work in the IT industry, their SQ scores are much higher than the controls as can be seen in Figures 1 and 2. One-way t-tests for the lowest SQ values (P-T = 1, people-oriented job roles) show they are very significantly above their respective controls ($t(222) = 3.80$, $p < 0.001$ for women; $t(138) = 2.87$, $p < 0.01$ for men). SQ then rises from that starting point for both men and women with the sole exception of P-T = 5 (technology-oriented job roles) for women, where it then returns to approximately the P-T = 3 level.

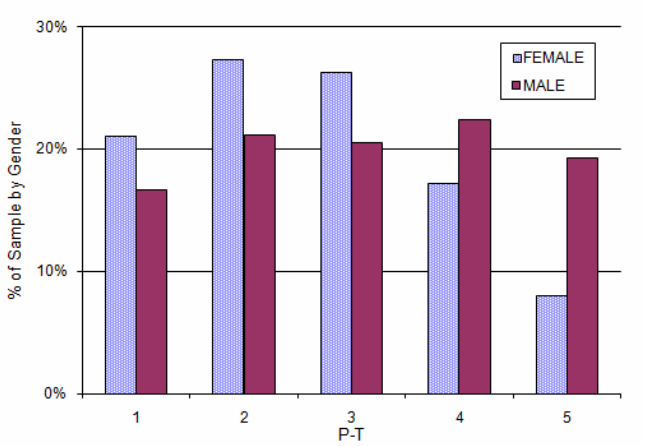

Figure 3. % of Sample by Gender and P-T

From Table 1 and Figure 3 it can be seen that relatively few women placed themselves in the P-T = 5 category (from one half to one third of the category 1 – 4 counts). This may be because very few women work in purely technical roles or they do not see their roles as exclusively technical. In any event, combining categories 4 and 5 removes the anomalous drop in SQ but has only a minor impact on the other results reported here.

That SQ would rise with the increasing technical orientation of job (towards P-T = 5) is perhaps predictable. From the study results, though, we can see a much larger rise in women than in men. In fact, for women, an analysis of variance across P-T is very significant ($F(4, 280) = 8.95$, $p < 0.001$) while for men it is not significant at all ($F(4, 151) = 0.77$, $p > 0.5$). This reflects men's generally higher mean score for SQ, meaning that job role (P-T) is less selective within IT. (In other words, men working in IT have higher SQ scores regardless of their actual function.)

But the most dramatic results are in the relationship between job role (P-T) and EQ. For women, an analysis of variance shows a small effect between P-T and EQ ($F(4, 280) = 2.48$, $p < 0.05$) but this disappears if categories 4 and 5 are combined. However, for men, the change in mean EQ across P-T is striking (see Figure 2). A trend analysis of variance shows $F(1,151) = 23.27$, $p < .001$ for the linear term (weighted).

DISCUSSION

As mentioned above, the mean EQ scores are consistent with the general population (as measured in the Baron-Cohen study of the normal population) while the SQ scores are all significantly higher. However, the dramatic drop in EQ by job role (P-T) for men in particular has important implications for user-centered design.

Low Empathy

The first is that because of low empathizing skills (EQ), male technologists (P-T > 3) will inherently find it difficult to see problems from a user's perspective. Coupled with the fact that they are excellent systemizers (high SQ) it is not surprising that they do not understand why a system might be confusing to users. Hence the tendency for technologists to blame users or to criticize their ability to follow instructions (the 'RTFM syndrome' referred to at the outset of the paper).

Multidisciplinary Design

This situation means that UCD practitioners are justified in promoting multidisciplinary design (as described in the ISO standard for human-centered systems [1]). As the study shows, higher empathizing skills can be included in a design team just by including more people-oriented job roles (of either sex). Furthermore, organizations need to acknowledge that empathizing skills are as important as systemizing in building *successful* interactive systems. Token involvement of non-technologists will in practice achieve very little.

Empathetic Awareness

To address some of the issues that arise as a result of low empathy, the problem must first be acknowledged. If technologists are aware that they may not understand a problem from a users' perspective, they can become more involved in discovering how that perspective differs from their own. Many UCD activities are ideal for this purpose: ethnographic research, usability studies, card sorting and so on. However, technologists must be actively involved. Reading a report of such activities will have very little impact by comparison. In fact, research into mirror neurons [5, 7] suggests that vision plays a primary role in empathy and the understanding of intention. This makes second-hand accounts of user needs and interaction problems a very poor substitute for first-hand or video-recorded observation – an effect that is well known among usability practitioners.

A further point is that empathizing skills can be taught, although research in this area has been limited to AS sufferers and high-functioning autistics [6]. (Note that although the EQ score in Figure 2 does drop below $EQ_{control}$, it is still substantially higher than the mean reported in Baron-Cohen's Study 2 [6] for Asperger's Syndrome and High-Function Autistics. The reported mean EQ there was 20.3.)

No Back Room

It is not enough to push technologists into the back room and close the door. A large number of interactive systems are built without the active involvement of HCI or usability practitioners. Also, technologists are often left to specify, design and build complete (although, admittedly, small) systems. On larger projects it does not benefit team cohesion to have key members who fail to understand user-centered design or the need for it. And unless systems are specified in minute detail, important characteristics are left to the implementers' discretion. Ideally implementers would recognize when further user-centered specification is needed, but this is unlikely if they lack the appropriate empathizing skills.

CONCLUSIONS

This paper and the study it describes raise issues that will come as no surprise to anyone who has worked in the IT industry for any length of time. Technologists – those in this study with primarily technology-focused job roles – are mostly male [8]. Their low empathizing (EQ) scores mean they have significant difficulty in recognizing and addressing the issues of 'real' users. For interactive system design in particular, various strategies for dealing with this 'EQ-SQ imbalance' are suggested in the paragraphs above. They involve techniques that expose technologists to users, rather than the current 'segregated' approach that sees technologists maintained at a safe distance from users. But there are larger issues relating to science and technology in general.

These observations are by no means intended to dismiss the very important role that systemizing skills have in many disciplines. But for any society seeking to increase women's involvement in technology-related domains, an important step would be to recognize the problems that reduced empathy raises and to work towards creating an environment that would nurture a better balance between the sexes.

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