What if Intraverted Women Tend to Dislike Java and Object Oriented Programming?

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Abstract—We consider the strong possibility that extraverted and intraverted women differ on preference for some aspects of programming, and how this difference might be more significant than its expression among men.

We discuss the reasons why we are moved to design a new study confirming a gender-specific relation of Myers-Briggs personality types to programming paradigms and specific language features. We discuss the implications of a significant gender difference on representation in industry, advancement in profession, and curriculum design. We invite hypotheses that explain a significant difference.

Past classroom questionnaires and future questions will be shown (but not data, since we are bound by IRB rules not to report them), as well as method of analysis and test for robustness in subcategories. We have a specific method for mitigating ambiguity and non-repeatability in Myers-Briggs type determination. Our cohort is expected to include about 500 Master's students per year, most from the same region in India, with about 25% women respondents, if we sample at past rates.

Keywords—java; object oriented programming; scripting; personality type; human factors; gender; software engineering; curriculum; programming language paradigm

I. INTRODUCTION

It is well known that many programmers have a strong preference for one programming language, or a strong dislike. Many programmers will defend one paradigm, such as object oriented programming, while others will attack it.

A common way of investigating personal preference is to look for frequency distinctions among personality types. Perhaps the best-known way of “sorting temperaments” is based on Jung's theory, as adapted by Katharine Briggs and Isabel Briggs Myers, over a half century ago. It remains one of the longest-lasting theories of personality, and is especially pertinent because it aims at differing styles of information processing and decision making (other personality tests aim at worker agreeableness, for example).

Myers Briggs Type Indicators (MBTI) have been correlated with many kinds of professional competence, including a long tradition in software engineering (pair programming / Katira 2004, code review / Cunha and Greathead 2007, team compatibility / Gorla and Lab 2004) and in student learning and retention (e.g., Koubek 1985, Felder 1988). MBTI has been used in the design of systems even before it was popular as a framework for understanding programmers. L. F. Capretz and his collaborators have been studying these issues for decades (e.g., Capretz 2003).

It is important to note that the main contention of this paper has to do with gender and extraversion, and that trait is part of several different personality theories, not just the Myers Briggs/Jung theory, e.g., Eysenck, Big Five and HEXACO. Hence, some of the claims are specific to MBTI personality theory, but the central claim is not.

In the MBTI E/I dichotomy, the essential question is whether a person expends "mental energy" with large groups of people, and whether a person is outwardly directed toward social gatherings or constructs. For example, a President might be very good at public speaking, and greeting large crowds of strangers, but may still take greater pleasure in solitary activities, or have a need to "recharge" with close family after large events. A doctor might possess a coolness toward people, and might tend toward professional reserve in social gatherings, but he could still be extraverted if standing in the community were extremely important to him.

II. PROPOSED STUDY

We have much anecdotal evidence and informal polling of past students from prior years: enough to suggest that a formal study is worth performing. Our current data are not reportable because polling was done informally, without IRB approval. Informal study has been valuable nevertheless, to suggest a specific protocol and questionnaire for formal study.

One technique we have used to good effect has been the recording of ambiguous MBTI dimensions, so that "borderline" cases need not be decided, arbitrarily, one way or the other. While this produces a large fraction of respondents with MBTI types that are not fully sorted, the actual
appearance of E/I, N/S, T/F, or J/P will be a small fraction of the total. We view this as removing measurement error, though some might contend that it is a restriction to those respondents who are strongly-E or strongly-I.

We expect to poll 250 students per semester, which would match our earlier informal polling rates, with 25% women. These students are all the same age from the same region with similar undergraduate preparation for computer science. Most importantly, they have not been pre-selected for compatibility with the U.S. programming standards and curriculum, which would represent a bias.

We also expect the study to show robustness to subsamples by time, delivery (online or on-campus), MBTI-determination method, and MBTI subclasses (e.g., rational NT, engineer NTP, and architect INTP). Statistical significance should be possible in the larger classes, such as N (e.g., IN vs. EN). A byproduct of our study will be ratios of the frequency of personality appearance among Master's in CS vs. the general population (we expect ENTJ types to be over-represented, and ISTJ to be under-represented). We expect to show that IS types do not all have trouble programming, as suggested in the past: most ISTP types might like programming.

III. CONCLUSIONS

Why should extraverted and introverted people disagree over their preference for Java over scripting, or vice versa? Our suggestion is that it is the object oriented paradigm, naming regimen, and expectation of code reuse that might be at work. Exportable names and reusable code seem to be extraverted characteristics. OOP tends to be as much about communication as manipulation of signifiers. Using a short, personal, polysemous name, "$x$", fits the intravert, while a more globally meaningful, proper, embeddable and acceptable name, "Fall2014_CSC570_testScores", fits the extravert. The former perhaps does not want anyone else looking at the code, while the latter has an expectation of shared source control and external review.

Why should a more pronounced preference be observed among females? The authors entertain several hypotheses. Perhaps the wrong programming paradigm acts as a multiplier of other hurdles. Perhaps it is viewed more as a privacy or control issue for women. Perhaps women have more options and can choose to avoid incompatible professional dogmas.

Whatever the cause, the implications would be eye opening. An insistence that all students, employees, or contractors program in a single paradigm will drive out as much as half of the female population. This would happen regardless of which paradigm was forcefully imposed. Men might put up with monoculture, but a full engagement of women could require multiple programming paradigms.

Our initial interest was not in gender. We wanted to show that P/J personality difference correlated with scripting/Java. But there was a first year woman having trouble in Java who wanted to drop out of computing, and one author suggested taking web programming first, then deciding. That student switched majors instead, thinking she could not program. Perhaps she was simply an introvert.

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REFERENCES