The Australian Library Journal

ISSN: 0004-9670 (Print) 2201-4276 (Online) Journal homepage: www.tandfonline.com/journals/ualj20

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To cite this article: Margaret Gaff (1994) GUI vs CUI: Individual personality types and the experience of learning to use library databases, The Australian Library Journal, 43:3, 183-191, DOI: 10.1080/00049670.1994.10755687

To link to this article: https://doi.org/10.1080/00049670.1994.10755687

GUI vs CUI: Individual personality types and the experience of learning to use library databases

• Margaret Gaff •

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Manuscript received April 1994

Some people have more problems than others in learning and using computer applications. The theory of personality type as developed by Myers and Briggs provides a model that could explain why this is so. The theory holds that if the working and learning situation matches the personality type preferences of the individual, then the experience will be more productive, more personally rewarding and less tiring. This is because the preferred and developed processes of the individual are called upon. This research, although very limited in scope, supports this view.

A pilot project, conducted as part of the course work for a Graduate Diploma in Social Ecology assessed the compatability between the Personality Types of five participants and their learning to use a database with a Character User Interface (CUI) and one with a Graphic User Interface (GUI). All participants found it was much easier and less stressful to use the GUI than the CUI database when they were learning to use them.

I AM particularly interested in the topic of database or computer interfaces and their compatibility with users because I, myself, find it an intimidating experience to be faced with the need to learn something new with computers. As a librarian in a government department, I am also aware that library users demonstrate a variety of attitudes when they need to use computers to access information: some prefer me to get out of the way so that they can do it themselves, and others prefer to have nothing at all to do with the computer.

Library databases can broadly be defined as those with Character User Interfaces (CUI) and those with Graphical User

Interfaces (GUI). Given the evidence that personality type preferences have a significant impact on the way individual students learn, I decided to apply personality type theory to assess the ease of learning to use databases having Character User Interfaces compared with those having Graphical User Interfaces.

The project was carried out as part of the requirements for a Graduate Diploma in Social Ecology. It was severely limited in the number of participants, and should be regarded as a pilot study providing tentative conclusions that could form the basis for future work.

Literature search

At the time my project was carried out in 1992, I found no research on the personality types of users of computers or of library databases. There was a trickle of literature on personality type as it related to library management.[1] There was considerable literature on users of Online Public Access Catalogues (OPACs).[2]

Martin Dillon described the experiences of relative frustration in users of Graphical User Interfaces (GUI) and Character-based User Interfaces (CUI).[3] His paper prompted me to think in terms of personality type, particularly when I realised that the favoured interface of his users was of the same stable as my employer's system, UNIX/SUN. Gordon Lawrence claims that personality type preferences have significant impact on how individual students learn.[4]

Fraser and Greevy reported on initial stages of research into individual learning styles of online users and their compatibility with the interfaces.[5] More recently, Margaret Muspratt and Heather Todd presented a paper at the 1993 ALIA Reference and Information Services Section(RAISS) Conference that argued the significance of self confidence for those learning to use library systems.[6]

Personality type theory

A well known version of the theory of personality types is the Myers-Briggs Personality Type Indicator (MBTI),[7] developed by Isabel Briggs Myers with Katherine Briggs.

Myers and Briggs developed their model of personality types from the work of Carl Jung.[8] Jung insisted that the personality type preferences of individuals remain constant, even though differing circumstances and situations cause people to overdevelop or underdevelop their preferences.

The theory allows for individuals to operate between the poles of opposites as illustrated below.

Table 1: The poles of personality type

Introvert	Extrovert
Sensing	INtuitive
Thinking	Feeling
Judging	Perception

In Jung's model, each individual has a preferred position along the poles, e.g. between Sensing and INtuitive. A preference for one or the other does not prescribe nor proscribe one's attitude and behaviour, but it does describe one's preferred way of doing things, of seeing the world and making sense and value of it.

A well balanced personality is flexible and is able to choose behaviour and attitude between the poles as a given situation requires.

Knowledge of one's own preferences and of the fact that others, too, have preferences, gives one a great advantage in understanding more about personal, relational and operational dynamics.

The following table lists the sixteen types as determined by MBTI. There are eight types that are **E**xtrovert and eight that are **I**ntrovert.

Table 2: 16 Personality types and their Dominant (D) function

Type	D	Type	D	Type	D	Type	D
ISTJ	S	ISFJ	S	INFJ	N	INTJ	N
ISTP	T	ISFP	F	INFP	F	INTP	T
ESTP	S	ESFP	S	ENFP	N	ENTP	N
ESTJ	T	ESFJ	F	ENFJ	F	ENTJ	T

Myers-Briggs used the individual's preference on each of the poles (see Table 1), including the extra poles they identified as **J**udging and **P**erception, as a guide to their personality type and to determine the dominant (**D**) function that is preferred above any of the others.

Work expectations

Myers developed the following work expectations for each preference.[9]

- *Extroverts* prefer to work interactively with a succession of people or with activity outside the office or away from the desk.
- *Introverts* prefer work that permits some solitude and time for concentration.
- *Intuitive types* prefer work that provides a succession of new problems to be solved.
- *Sensing types* prefer work that requires attention to details and careful observation.
- *Thinking types* prefer work that requires logical order, especially with ideas, numbers or physical objects.
- *Feeling types* prefer work that provides service to people and a harmonious and appreciative work environment.
- *Judging types* prefer work that imposes a need for systems and order.
- *Perceptive types* prefer work that requires adapting to changing situations, or where understanding situations is more important than managing them.

When there is a mismatch between type and occupation, the client usually reports feeling tired and inadequate. According to type theory, the mismatch causes fatigue because it is more tiring to use less preferred processes. A mismatch also causes discouragement, because despite the greater expenditure of effort, the work product is less likely to show the quality of products that would be developed if the preferred process were utilised. Tasks that call on the preferred and developed processes require less effort for better performance, and give more satisfaction.[10]

The specific combination of an individual's preferences lend particular strengths and weaknesses to different situations. Thus in applying the above information to the experience of learning to use a library database, it is apparent that if the logic of the interface matches the type preferences of the individual user, the experience will be less tiring and less frustrating than an interface that does not match.

Personality type data

A source of MBTI type data is G. P. Macdaid's *Myers-Briggs type indicator atlas of type tables* [Atlas] of 1986.[11] The data are generated from the scoring service

which began in 1971 and included more than 250,000 records at the time of publication.[12]

Some of the MBTI statistics are of particular interest because they indicate some of the practical ramifications of the combinations of preferences. For example, those people whose preferences are for both **IN**tuition and **P**erceptive can constitute as little as 1% or 3% of the national population depending on the combination of their other preferences. Yet these preferences can constitute up to 30% of university students.

Those with preferences for both **S**ensing and **P**erceptive, and particularly if they also are **E**xtrovert, are disadvantaged in that few complete their secondary education. I suspect that those users of my library reference materials who show a particular reluctance to read the materials for themselves have these preferences. One can deduce that they may also have had learning problems in the school room, but nevertheless they are competent and successful workers in their own fields.

Those people whose preferences are in the minority of the population tend to take longer to establish their own sense of competence and self worth because these aspects of self are developed in relationship to others. This self-perception can be reflected particularly in their attitude and approach to situations where their preferences are not the required strengths. It has particular significance when these people are learning to use computer applications.

Pilot study: CUI v GUI

As a pilot, I confined my study to a small population of five participants, each of whom conducted a number of predetermined searches on two databases, one having a graphical, and the other a character, user interface.

The participants

The participants for this project were five people who readily agreed to help me with my research: one was a teacher-librarian and four were geologists. All participants had completed tertiary studies: one had a degree in education and a graduate diploma, two had honours degrees, one was completing a PhD, another had both a masters degree and a PhD. With such a small sample it was not possible to cover the full range of personality types. By chance all were introverts, but with a range of other preferences. The personality types represented were INTP, INFP, ISTJ, ISPJ and INFJ.

In addition, five others participated in the development of the questionnaires and the process of the research. It is significant that the type preferences and experiences in learning to use the two library databases reflected those of the participants in the study proper

The databases

GeoRef is a typical PC based CD-ROM screen interface.[13] It is a character-based user interface: it is menu driven, with character prompts and options displayed on the window periphery. The CD-ROM version of the database contains some 1.5 million records and is produced by the American Geological Institute using Silverplatter software. The database has been available both in hard copy as *Bibliography and Index of Geology*, and online through DIALOG Information Services Inc., for many years. The CD-ROM has been on the market for something over two years and is updated annually.

Because *GeoRef* is intended to be self explanatory with its instruction handout and on-screen helps, I decided not to give participants additional verbal instructions.

The printed instruction handout is in a point-by-point format. It is quite complex because the database allows for very complex searching and has a range of options that are designed to limit the product of a search to the user's particular requirements.

GeoRef provides a range of helps and instructions on screen. There is quite a lot of detail on each screen that the new user must read carefully. The on-screen guide requires the user to go through a range of screens to find the appropriate prompt or command. The novice must discover the significance of the language in the context of this database and find the particular prompts and terms to use.

LibraryIndex is an open-windows, graphic user interface (GUI) mounted on a UNIX based SPARC network.[14] It has graphic options either on display or available by clicking the mouse to select pull-down menus or windows beneath a series of icons. The database is the joint use catalogue of the Northern Territory Department of Mines and Energy and is networked from Darwin and Alice Springs. It contained some 12,000 records at the time my research was carried out.

The interface was designed inhouse using commercial software.

The printed instruction handout was produced inhouse and was written in a narrative style. It described a step-by-step process for each of the types of searches a user was likely to require.

The simple searches described can be extended to become more complex by using the options that are available behind the icons. There are not as many options available to users of the GUI *LibraryIndex* as there are to users of the CUI *GeoRef*.

Method

Each participant was required to find the answers to three questions on the CUI database first, and then to three similar questions on the GUI database. Each set of questions was identical in structure — in what they required of the participant and of the database – but not in content. The questions were intended to be typical of the kinds of questions library users ask. The first related to the *author* of a paper, the second to a *title* and the third to information on a particular *subject*.

The questions were designed to be basic and simple, and did not require the use of any of the more complex options available on both databases. However, it was necessary for the participants to explore the options available on each of the databases and to choose the procedures that best suited the particular search question.

After working through the first computer exercise on the CUI database, the participants completed questionnaires relating to their experience in using it, their perception of the value of the printed instruction handout, the on-screen helps and on the computer exercise questions themselves .

The process was then repeated for the GUI database.

My engagement with the participants was minimal during the computer exercises, although I believe people often find it easier to learn if they hear information as well as read it.

There were some technical down-line problems for some participants while they were using GUI database. This caused them frustration, but seemed not to detract from their ability to differentiate between these technical problems and the workings of the

Table 3: Summary of participants' Personality Types, Dominance (D), Gender (G), and their Experiences and Computer Compatibility

Type	D	G	**CUI** GeoRef Experience	**CUI** GeoRef Comment	**GUI** Library Index Experience	**GUI** Library Index Comment	General Computer Compatibility
INTP	**T**	M	Dissatisfied	Frustrating	Satisfied	Relaxing	Great deal of effort
INFP	**F**	F	Satisfied	Frustrating	Highly Satisfied	Perfect, enjoyed	Some problems
ISTJ	**T**	M	Satisfied	Very easy	Satisfied	Very easy	No real problems
ISFJ	**S**	M	Satisfied	Frustrating	Satisfied	Easy	Great deal of effort
INFJ	**N**	F	Satisfied	Challenging	Satisfied	Nice and friendly	No real problems

database itself. In fact, participants took considerably less time to do the GUI exercises and questionnaires than the CUI ones.

Results

Table 3 is a summary of the types within the sample, their dominance, gender and their experience and comments on both of the databases, together with their own estimation of their compatibility with computers.

Summary of Results

All five participants found the GUI database to be very easy to use. Their experience supported the aspect of type theory that holds that if the logic of the task matches the Type Preferences and Dominance of the individual user, the learning or work experience will be productive and energising.

While the results for the use of the CUI database on CD-Rom were at least ambiguous, there was no doubt that the experience was less satisfying for at least three of the five participants than their experience using the GUI database.

The participants' experience with the GUI can be interpreted as being outside their previous experience with computers, and differs from their own estimation of their general compatibility with computers with the exception of the ISTJ participant with a Thinking dominance.

Discussion

Because of the very small sample of five participants, my conclusions must be regarded as extremely tentative. However they can be seen as offering possibilities for more rigorous investigation and evaluation in a larger sample.

The GUI database was significantly easy to use. The experience for each participant was one of ease, friendliness and even relaxation, regardless of their personality type and work preferences. The use of the CUI database, for at least four of the five participants, was characterised by frustration and challenge. This was regardless of their personality type and work preferences. It should, of course, be remembered that the sample covered only a portion of the possible personality types.

It is interesting to note that the participants' own estimation of their general compatibility with computers matched more closely with their experience of the CUI database than the GUI database.

Only the participant with ISTJ preferences found the experience of using the CUI to be completely satisfying and rewarding. This suggests that CUI best suits those individuals who are:

- *Introverts* who prefer solitude and time for concentration
- *Sensing* whose strength and energy is in working worth details and careful observation
- *Thinking* whose strength and energy is in working with logical order, especially with ideas, numbers or physical objects
- *Judging* whose strength and energy is in their preference for work that imposes a need for systems and order.

At least some other personality types can expect to have to work considerably harder to succeed and feel rewarded in the use of CUI computer databases.

Each of the participants, regardless of their type, was able to answer the set questions using the CUI database. That they were successful in this regard, despite the fact that the experience was unpleasant to quite some degree for most, indicated that these individuals had the capacity to persist in a situation where their motivation to succeed was high. Their success does not negate the fact that they had to work hard for it.

The findings of my pilot study support those of Dillon,[15] in that GUI was preferred over CUI, and of Fraser and Greevy[16] in that individuals will persist in the use of computers only if sufficiently motivated. One could extrapolate that if individuals are not highly motivated and if they can find their information elsewhere, they are less likely to persist in learning and using a computer when their initial experience was frustrating and annoying.

Points to be considered when looking at the participants' responses include their individual details of age, gender, general education, computer education and experience. These dimensions must affect at least their self-confidence and their ability to predict what might be required of them in learning to use a library database. In particular the MBTI statistics show a female preference for Feeling of 75% of the population as against 25% for Thinking. These figures raise questions regarding the gender and personality type preferences of computer programmers, trainers and users that I have not addressed in this research.

Implications for librarians

Interface design

Librarians generally aim to create a user friendly library environment. It is my contention that we have not seriously begun to consider the application of that value when it comes to users and their interface with library databases.

It is reasonable, given the state of technological development, for managers of information services to insist that optional interfaces be available to users of library databases so that different personality types can choose the kinds of interfaces they find suit them best.

Librarians could pressure vendors to produce interfaces that are more compatible with users' personality and work preferences, rather than unconsciously assuming that 'this is the way computers are' and that users must, therefore, adapt.

Instruction handouts

The participants in this research indicated that they found the style of written instruction for use of the databases to be significant to their ease of learning. This suggests the value of providing the same

instructions in both narrative and point-by-point styles.

Library management

For librarians and their staff, understanding the implications of their own personality type preferences and that of co-workers can be illuminating. To open one's mind to the validity of different approaches, strengths and weaknesses of individuals in particular situations, can be instructive.

It could be a valuable exercise for staff teams in libraries to establish their personality types using the MBTI[17] or Margaret O'Dwyer[18] type indicators. A group intending to carry out this exercise would be wise to employ accredited people who may be practicing consultants or psychologists.[19]

Understanding something of personality type preferences does not change what, and why, things must be done, but it does offer the possibility of a change in attitude and approach that can make for a much more constructive environment, particularly for those whose learning and working strengths are in other areas.

There is opportunity then to consider a wider range of options and approaches that are valid and perhaps more productive.

Spin-off for library users

An awareness of personality type theory would allow library staff to have a greater understanding of why one person could be having more difficulty than another in learning to use a particular OPAC or database. As a consequence, assistance offered by staff would be likely to be less critical, and more empathetic, than might otherwise be the case.

A choice of interface between GUI and CUI, as well as a choice in style of instruction handouts, would assist novice users to learn to use library databases.

In my study, the five participants experienced reduced anxiety and tension using the GUI database, regardless of their previous computer experience. Users who are little stressed by the experience of learning something new on library databases are more likely to be repeat users.

Librarians, educators and computer designers and programmers must conclude that there is more knowledge and understanding to be gained about the way people learn to use computers. In the meantime, the library can be a more user friendly place if staff can appreciate that there are indeed different ways of learning and working, and that these are of equal validity.

References

1 Carol Kenchington, 'Trainline', *inCite*, 24 June 1991, p.4.

2 L. Allen, 'Designing information retrieval systems with the client in mind', in *Garbage in, garbage out : the need for quality in the age of automation: conference papers, Australian Library and Information Association, 8th National Cataloguing Conference, 14-16 September 1989, Hotel Adelaide, North Adelaide South Australia,* editors Alan and Judith Bundy. Adelaide, AUSLIB Press, 1990, pp.95-107. T. Bellardo, 'What do we really know about online searchers?' *Online Review* vol. 9, June 1985, pp.32-37.

3 M. Dillon, 'The current state of interface research' in *Information online & on disc 91, Proceedings of the ... Australasian Information Online and On Disc Conference and Exhibition.* [Sydney], Information Science Section, Australian Library and Information Association, 1991, pp. 323-349.

4 G. Lawrence, *People types and tiger stripes: a practical guide to learning styles*. 2 ed. Gainesville, Fla., Center for Applications of Psychological Type, c1982.

5 D. A. Fraser and D.U. Greevy, 'Is online right for everybody? Market research on end-user mentalities: progress report', in *Proceedings. Twelfth National Online Meeting*. Learned Information. New York, 1991. pp.87-92.

6 Margaret Muspratt and Heather Todd, 'Confidence: the key to effective use of information technology by library staff and clients', in *Infobridges: linking Australia and Asia: proceedings of the Second National Reference and Information Service Section Conference, Darwin 9-11 July 1993*, edited by Murray Maynard. [Darwin], Reference and Information Service Section, [1993].

7 I.B. Myers and P.B. Briggs, *Gifts differing*. Consulting Psychologists Press, Palo Alto, CA, 1980. I. Briggs-Myers and M.H. McCaulley, *Manual: a guide to the development and use of the Myers-Briggs personality type indicator*. Consulting Psychologist Press, Palo Alto, CA, 1986. I. Briggs Myers, *Introduction to type*. Consulting Psychologists Press, Palo Alto, CA, 1980, Appendix 1.

8 C. Jung, *Psychological types*, a revision by R.F.C. Hull of the translation by H.G. Baynes. Vol. 6, collected works. London, Routledge and Kegan Paul, 1971.

9 I. Briggs Myers and M.H. McCaulley, *Manual: a guide to the development and use of the Myers-Briggs type indicator*. Consulting Psychologists Press, Palo Alto, CA, 1986, p.78.

10 ibid p.78.

11 Gerald P. McDaid et.al., *Myers-Briggs type indicator atlas of type tables*. Gainesville, Fla., Center for applications of Psychological Type, c1986.

12 ibid. p.2

13 *GeoRef* is produced by SilverPlatter Information Inc., 100 River Ridge Drive, Norwood. MA 02062-5026 USA.

14 At the time of the survey the library database was mounted on Postgres software. Postgres is a developmental object oriented database system produced by the University of California at Berkley. The *LibraryIndex* interface runs on the XWindow System. See Dan. Heller, *XView programming manual*. Sebastopol, CA. O'Reilly & Associates, 1991.

15 M. Dillon, op cit.

16 D.A. Fraser and D.U. Greevy, op cit.

17 I.B. Myers and P.B. Briggs, *Gifts differing*. Consulting Psychologists Press, Palo Alto, CA, 1980.

18 Margaret T. O'Dwyer, *Wake up the sun*. Desbooks, Melbourne, c1988. The indicator included in her book, is available for photocopying free of copyright and is self-scoring.

19 In Australia, accreditation for administering MTBI tests can be gained from The Institute for Type Development, (PO. Box 51, Telopea NSW 2117), Champagnat Centre, 16 Dorahy Street, Dundas. N.S.W. 2117.