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PERSONAL COMPUTERS IN THE HOME:
A COLLABORATIVE INQUIRY

by

Christopher John Edwards

A thesis
presented to the University of Windsor
in fulfillment of the
thesis requirement for the degree of
Master of Arts
in
Communication Studies

Windsor, Ontario, 1985

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ABSTRACT

The thesis sets out to determine the effects that the introduction of the personal computer (PCs) into the home environment is having on family relationships, and especially, the effects on communication and interaction patterns. Of particular interest was the impact that the PC is having on adult learning styles and learning activities as a result of using an interactive communication medium.

A collaborative approach was employed, based on new paradigm research methods. Such inquiries are contextual in nature; therefore, the onus is on the researcher to employ self-reflexive tools to track the level of growth of awareness of salient issues. These tools include the keeping of a reflexivity journal, triangulating the findings by employing multi-operational devices, and the development of a propositional inventory.

The use of 'human' participants involves ethical considerations, and the researcher must be aware of the problems inherent in collaborative inquiries. The onus is on the researcher to be aware of the consequences of such inquiries, and these problems are discussed at some length in the thesis.

Initial misgivings with the 'literary' based nature of writers on the topic became apparent during the development of the propositional inventory. It appeared that little in the way of empirical analysis was being conducted into the effects of PCs on the family. The practice, however, had quietly and quickly begun. Therefore, a study that incorporated users, and preferably, heavy users, would therefore add to a growing body of literature on the topic. These users would have first hand accounts of what it was like to incorporate a personal computer into the home. A set of ten propositions, the researchers expectations based on the writings in the propositional inventory, were set out at this stage, as well.

Intensive, unstructured and in-depth interviews were performed with a number of participants. Six heavy, or serious users of PCs were chosen to collaborate with the researcher. As a method of controlling the sample, six non-users of the same socio-economic status were chosen, and served as a comparative base. To check the accuracy of the what the users were discussing about the effects that the PC was having on family life, the wives of the users were asked to participate, as well. The collaborators received respondent checks, a brief overview of the interviews, and were asked to comment on them.

Analysis of the interview tapes was then initiated. An exhaustive list of themes was developed; these were plotted

on a matrix, and were categorized from most popular to least popular, in terms of discussion (18 main themes emerged). And, each respondent was categorized according to level of awareness on each theme.

To try to make sense out of the data that emerged, the person-card technique (Hibino & Nadler:1980) was employed. Then, a rank order survey was performed on a PC user group meeting, and participants were asked to rank the 18 main themes that emerged from the interviews, in terms of importance. The user group survey could then be compared to the interview data, to see if differences in perceptions occurred from one method to the other. Biases that may not be apparent in one method may emerge when multi-operational techniques are employed.

As new literature was uncovered during the course of the research, these were input into the reflexivity journal, which by now had become a tool for tracking the development of growth of awareness on the topic. Many new insights emerged, and formed the basis for re-examination of the propositional inventory.

With the analysis of emerging trends of PCs in the home nearing completion, the researcher returned to the users to determine if his perception of their reality was valid. This took the form of a phenomenon recognition check, which employed the person-card technique findings, and an exercise based on Brod's concept of Techno-Stress (1984), which had a

profound influence on the researcher. Any discrepancies in the researcher's perceptions and the users' views were then incorporated into the findings.

Many findings emerged, and these were related to emerging trends within the personal computer industry, which is in a period of rapid transformation (eg- whole new technologies appear approximately every two years which make the last generation of products obsolete).

Since the microelectronics industry is undergoing an enormous period of transformation, the thesis concludes that a new generation of users has emerged, one that is dividing into a multiplicity of styles (cf-Turkle;1984). The users as adult learners is also examined, with a note on an amazing level awareness of continuing adult self-directed learning on the part of the users who collaborated in the study. Some reservations are also expressed about the tendency for many writers in the field to provide the society in general with "mythinformation" about the effects of personal computers on our lives. The thesis hopes to dispel many of these myths, and attempts to set the debate about the effects of personal computers in the home into a theoretical framework.

ACKNOWLEDGEMENTS

Many players were involved in this research project, and deserve to be recognized for their efforts. Dr. Tom Carney spent many long hours as chairman of the research, often above and beyond the call of duty. I'd like to take the opportunity to also thank Drs. Powell and Selby for their contributions and suggestions, especially in the latter part of the research. As peer-de-briefers, their role in the project was a valuable one. Words alone do not express the gratitude that I have for all their support.

Dr. Richard Lewis was also very supportive, and helped to set up the rank order survey and struggled with me to analyze the results with a user-hostile statistical package known as SPSS-X. All the collaborators who allowed me to briefly enter into their lives and were very co-operative deserve to be thanked; this is really their story.

My thanks also to the developers of the program "Think-Tank", which was very helpful in getting the headings and sub-headings into order.

I'd also like to take this opportunity to thank all my friends who kept the faith during the trials and tribulations of my life as a grad student. To Kulene and Laura, who inspired me to carry on, to Frank and Tony, who shared

thoughts and ideas, and to the many others who had to listen to countless rantings about the effects of PC's on our lives. A special debt of thanks is owed to my grandmother, Mrs. Marie Louise Martel, who persuaded me to return to school (and supplied the initial funds when I was an undergrad student). And finally, to Elaine, for lending support to these endeavours by providing patience and understanding.

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Chapter I

INTRODUCTION

BACKGROUND

In 1984, the microelectronics industry spent over \$700 million on advertising to try to woo the consumer into buying a personal computer. We are steadily being bombarded with stimuli which encourage us to become a part of the 'computer generation'; the personal computer has arrived, whether we are ready or not.

Supporting the notion that personal computers (PC's) are going to make life a whole lot better are a host of scholars and writers, who claim that the PC is a panacea for the ills facing society today. Many of these works are quite Utopian in nature, and a whole school of researchers has emerged proclaiming that we are on the verge of 'computopia' (Tofler;1980; Cornish;1983;Masuda:1981).

The vast majority of the literature on PC's and society tends to be anecdotal in nature; that is to say, little in the way of empirical research has been conducted thus far. Communication scholars are only now beginning to examine the effects that the PC is having on our lives; much of the prophecies that are being projected are subject to scepticism, as shall soon be illustrated.

This study sets out to examine the effects that the introduction of a personal computer into the home environment is having on family life. The concerns of the research are many, but the major emphasis will be on the role that the PC is having on changes in communication and interaction patterns that result, and the impact of these changes on the family's communicating, and interacting, with one another. It was expected that many other salient issues would be uncovered during the course of this study, as well. Of particular interest was the impact on learning styles and learning activities that might result from the use of this interactive communication medium.

RESEARCH METHODS

This thesis follows the guidelines of new paradigm research, a technique modified and enhanced by Dr. Thomas Carney (1983); a collaborative approach was employed.

Collaborative Inquiry

Intensive, in-depth, unstructured interviews with a number of serious PC users, (preferably family people), their spouses, and a matched sample of non-users were performed. The hope was that this sample would be well suited for the examination of the thought worlds of PC users and non-users. The term 'collaborative' is the key to new paradigm research; interviewees were seen to be collaborators in this

project, and not experimental subjects. By actively encouraging the respondents to participate in the study, it was hoped that a greater sense of sharing would ensue, generating the kind of responses impossible to achieve by questionnaire. Collaborative research means that both the researcher and the respondents grow in awareness and sensitivity to the issues that emerge during the study. This means emergent design, (instanced in this study, by the decision to run a cross check on the perceptions of the impact of PC use held by the spouses of heavy users).

Reflexivity

Since the researcher will, by necessity, be affected by the research findings, careful checks have to be employed to enable the study to retain a sense of objectivity. In other words, it was important to try to be objective about the researcher's subjectivity. The thick description, to be outlined below, provides collaborative researchers with this means of checking on movements' in their frames of reference and understanding. The same kind of checking has been attempted for collaborators.

Since respondents are deemed to be collaborators, their input had to be solicited. Words are not being put into their mouths, nor are their views being interpreted in ways unacceptable to them. The unstructured interviews also ensure that the topics of discussion are those provided by the respondents, and not by the researcher.

Triangulation

As a method of triangulating the findings, a rank-order survey was also initiated with the help of a PC users group. This survey enabled the researcher to compare the views of serious PC users who were not exceptional PC users with the views of the exceptional PC users who collaborated in this study.

Propositional Inventory

At the outset of the study, a propositional inventory of queries, hunches and theories, supported by the literature, was set out. This represented the researcher's understanding of these issues as far as he was capable of exteriorizing and articulating it, at that point in the research endeavours. It is a device for checking on the subsequent changes in this frame of reference on these issues. After the interviews were completed, and new literature began to support or refute these propositions, it was possible to see exactly how the researcher grew in awareness of the salient issues that relate to user's real life experiences. It was then possible to support or refute the conventional wisdom about PC's in the home, in the context of this study.

Findings and Conclusions

Finally, an attempt was made to try to bring together all the research material into some form of conclusion. New literature findings, together with the interview and survey findings, will provide the basis for future researchers to use as a comparative tool. Commonalities of experience within diverse contexts are likely to be more generalizable.

Note on "Readerly" vs. "Writerly" Expositions

A 'text as plasticene' approach comes with using a word processor: the one piece of typing can assume a variety of formats merely by changing a few 'macros' (short instructions written into the typescript). So, one becomes sensitive to what the format is 'saying'. A 'readerly' format presumes that the reader is merely the recipient of objectively perceived and dispassionately described reality. It adopts a linear, straightforward, objective narrative, with a uniform font, pitch and text blocks. It assumes that the reader will interpret this single-track message according to the writer's culturally prescribed expectations.

A 'writerly' format assumes that there are multiple viewpoints embodied in the writing- and likely to be operating in its reading. So a multi-track exposition is called for. There has to be a mix of 'objective' and subjective styles (exemplified here by the chapters on the methodology and the findings respectively). The text block arrangements should

remind the reader of the variety of viewpoints which underlie the exposition: cut-aways to an Appendix, or changes in a chapter from one topic to the next, are meant to assist the reader in taking an active part in interpreting the text.

Obviously, the writerly approach is the more appropriate format for presenting an inquiry such as this. So it has been used (cf. Manning, in Van Maanen; 1983: pp.225-245).

Chapter II

NEW PARADIGM RESEARCH: AN OVERVIEW OF THE TECHNIQUE

For one to understand how a research project may be undertaken employing new paradigm research (henceforth NPR), it is necessary to give a brief overview of how the technique works. This section will focus on how a project is initiated, conducted, and results derived, to allow the reader to better understand this interesting research technique.¹

There are two common approaches to research:

1. To collect public data on exogenous variables (external variables like SES)
2. To collect personal data for endogenous variables (internal variables such as learning styles).

"NATURALISTIC" INQUIRY

The so-called "classical" research paradigm generally requires the researcher to define the variables to be studied and the methods for studying them. The so-called "new" or "naturalistic" paradigm is primarily interested in identifying endogenous variables when it is difficult to determine them. There are no "good" or "bad" approaches to research,

¹ This model is based on the ongoing research by Dr. Carney, Dept. of Communication Studies, University of Windsor.

just different techniques suitable for different purposes. Due to the lack of definitive research variables in the extant research literature, a naturalistic paradigm was employed.

Aims and Motives of the Study

In NPR, at the outset of the project, and in the early stages, the researcher must set out in a brief statement, the aims of the study. Briefly stating the study's aims is usually sufficient to require the researcher to focus specifically on what it is that is under investigation, a very important concept for this researcher. By clearly stating one's motives for doing the research, which deepens awareness of one's own possible biases, and because collaborators will certainly ask for the motives behind the research (and will only collaborate with deeply meaningful motivations), a greater sense of awareness is expected.

Emergent Design

The next phase involves the research design. In NPR, emergent design is presumed; nonetheless, an initial research design is necessary (only against this can deficiencies in methods and results be clearly seen). Insights gained from collaborators, (the interviewees) and from peer de-briefers, (in this case, the thesis committee), cause alterations to the initial research design. In NPE, this is

not seen as being a failing in the method. Instead, it is seen as an intrinsic part of the process, allowing for the methodological development necessary when researching a novel and emerging phenomenon. It is also presumed that responsive evaluation and formative evaluation will operate throughout the project: that is, the evaluation will shape the research at all stages and not be applied only after its completion.

Formative Evaluation

Formative evaluation involves the participants' feedback and queries; this shapes the work as it develops, and may actually change some of the methods used. Responsive evaluation means that the researcher is open to the definitions of the situation provided by his collaborators, (whose constructions of reality he is, after all, investigating). Also, he is to respond to new issues raised by interested parties during the research. These issues may or may not play a part in the process, but the researcher keeps an open mind about their feasibility, since they have been raised by persons heavily involved in the novel and emerging phenomenon under investigation.

Reflexivity Journal

Before the interviews begin, there are several measures that are taken to help the researcher to focus on the topic at hand. The development of a reflexivity journal must be initiated. This journal is based on Progoff's Intensive Journal (Progoff:1975), and provides a baseline against which the researcher will be able to check growth of awareness of the topic being researched, learning styles, and problem-solving styles. The first step along this path is the development of the propositional inventory, which asks the question: "What do I know about this topic today?"

The propositional inventory is one of the core concepts of NPB. Experiential self-study is essential if the researcher is to produce valid data. Novel concepts are only visible against a well-informed expectancy of what could result. In the propositional inventory, a list of hunches, queries and theories of which the researcher is aware is detailed at the outset of the study. As holistic awareness of the topic begins to develop, with new insights being dated, and their impact on the gathering research identified, the propositional inventory will serve as a basis for the examination of the growth of the researcher's awareness.

The reflexivity journal will also serve another function as the study progresses. A stream of thoughts on the project will be constantly put into the journal, and fed from there to all other relevant parts of the work, deriving from re-

flections on the rapport interviews and peer de-briefing sessions (what Progoff calls the 'dialogue with persons'), and on the analytical notes (Progoff's 'dialogue with works'). This is the vehicle which will guide the researcher towards the growth of insights.

Thick Description

At this point in the study, the journal gets divided into sections, much like a computer manual (i.e.- Sec. 1.1, 1.2, 1.3, 2.1, etc...). The journal is part of the thick description, an approach pioneered by the anthropologists, in the ethnographic tradition (cf- Geertz- Chpt.1). The thick description will contain at least the following in its body:

1. The data base: tapes, interview notes, and observer comments on non- verbals
2. Appendix, containing unusual contextual factors which could affect the interviews concerned
3. Analytical notes on the interview data
4. The reflexivity journal
5. Respondent checks (which ensure accuracy)
6. Peer de-briefing notes
7. The growth of- emergent design, interpretive schema
8. Bibliography and footnotes

The thick description approach aims to help the researcher to move from an awkward fumbling for the most basic understanding, to a supported claim to have achieved it (Car-

ney;1983:31). The aim isn't to predict, but to interpret. Theoretical ideas are taken from previous studies or from relevant conceptualizations of similar problems.

The thick description is also designed to provide enough contextual detail to enable another researcher to tell what's transferrable to his/her research. The audit trail (defined below), which it facilitates, also serves towards this end.

Interviewing Methodology

At this stage in the research design, the scholar prepares for the unstructured, in-depth rapport interviews. Since the problems of identifying a relevant sample base will be dealt with in a further chapter, let us presume that the group to be interviewed has been identified.

Since the interviews are going to be unstructured, the researcher has to be careful to position the basic question/inquiry carefully. Questions must be clear and shrewdly directed. To achieve this end, a question protocol is developed. The question protocol prevents the researcher from over-structuring and asking leading questions. In NPB, the aim is not to prove or disprove a certain thesis, but to find out what is in the interviewee's mind. Isaac (1972) developed an excellent frame on how to set up minimally leading questions. Follow-up probes are designed to enable the researcher to get at the deep sub-structures that the respondent is discussing.

Once the non-leading questions have been established, the interviews are ready to begin. Since respondents are deemed to be collaborators in the project, they are briefed on the philosophies, aims and procedures of the study, at the outset. The researcher may not trick or manipulate the respondents. The collaborative approach means that the researcher may be able to gain, as a collaborator, persons of a type who normally wouldn't participate in survey interviews (i.e. elites).

The significant difference between "classical" and "new" paradigm research is the presence of deliberate attempts to keep the observer at "arms length" in the classical paradigm. The reason for this action is to avoid "contamination" of the event and observer. The careful method of interviewing is intended to avoid contamination of the interview, in NPR; but "keeping at arm's length" is not held as possible, given the involvement of all parties in the subject under examination. So the checks on reflexivity and the triangulation techniques are intended to monitor reflexivity after the event.

Once the respondent has been briefed, the researcher asks if it is permissible to turn on the tape machine. Taping the conversation is crucial, for there will be a minimum of note taking by the researcher during the interview, since this detracts from active listening. The interviewer must pay attention to cues that the respondent gives to certain probes;

such cues include kinesics, proxemics and para- linguistics. These factors may be briefly jotted down by the interviewer, perhaps in the form of a code, which will later form a part of the appendix. By following up on the cues being given by the respondent, the researcher is able to probe into the deep sub-structures of the respondent's mindset. This involves repeatedly going over what was said, over an extended period of time. Therefore, it is essential to have the speaker's actual words, not the researcher's abstract of them. Hence, tape recording is essential.

Ethical Code

NPR invokes some very sensitive ethical issues, since it involves collaboration with respondents. The researcher must be aware of these issues, and, by following the ethical code of NPR, will avoid sticky ethical issues at a later date.

The foundation for the ethical code began with Glaser and Strauss in the 1960's, in their discourse on 'grounded theory'. However, in the biological sciences, the naturalistic model for research has an honourable history into antiquity. The "newness" of this paradigm arises from the recognition that the "normative" or "most common case" approach only reveals a portion of the truth in an event. Non-normative procedures are needed to explain non-normative variability.

The ethical code that was operational throughout the course of this research was modelled from the work of Reason

and Rowan (1981), and may be summarized by the following words: "Good research means never having to say that you're sorry". This means that all the tools of NPR have to be used. This includes:

1. "Levelling" with collaborators, which means that they cannot be "tricked" or manipulated; ('research subjects' have the same status, as a concept, as 'sex objects', in NPR)
2. The study must have positive aims, and be socially significant (this is the only way to get co-operation from participants or elites)
3. Evaluation on the part of the respondent is required, and is both formative and summative; that is, respondents see the ongoing work and are asked to comment on it. They see the final reconstructions and are asked to perform a phenomenon recognition check. Their input is welcome at any point, for they are the experts on the topic. This means emergent design and a grounded scheme of interpretation.
4. The researcher is deemed to be a part of the study and is him/herself audited for bias. The collaborators are not held at "arms length"; the researcher has to recognize the likelihood of expanding his own consciousness in the process of understanding the highly sophisticated thought world of his collaborators. The latter are likely themselves to deepen

their understanding of their constructions of reality as a result of articulating their views on that reality and seeing their views reflected back to them.

- So controls must constantly run on the researcher via reflexivity checks, and the possibility of changes in the collaborators' mind sets must be monitored for
5. Good research means that the receiver develops in sensitivity, by employing reflexivity tools, and incorporating into his own mind-set serendipitous findings. He cannot do this without a framework to help in the understanding of learning styles and processes (Kolb:1984). Researchers cannot expect a collaborator to be raising his/her consciousness about learning and problem-solving styles, if the researcher is not doing the same.

Interviewees must be exemplars of the mindset (or whatever it is) that is being explored. Of course, this implies a purposive sample, usually of a small base. The researcher must explain, in the thick description, how and why each respondent was selected, to ensure that each interview typifies the aim of the study. Non-exemplars, or those who are directly in opposition to the views (or whatever) of the exemplars, must also be interviewed; these act as a form of a cross-check to the group under investigation.

The names of the respondents in the current study were not revealed to anyone but the thesis supervisor (by agree-

ment of the thesis committee), to protect confidential information.

ANALYSIS OF THE INTERVIEW MATERIALS: STAGE I

After an interview has been completed, the researcher must begin the complex task of analyzing what was said. This may be seen as a two step process. In step one, the analysis of the data provided in the individual interviews is carried out. Then, in step two, the analysis of one interview as a part of the totality of all the interviews is pursued.

As soon as possible after the interview, the researcher goes over the tape recording. Observer comments may now be content analysed (a thematic content analysis is employed in this study), and a summary of the interview data commences; this is known as the 'packaging and re-packaging' of the notes. The core contents of the interview are worked out, which helps to establish an outline of the interview. Any unusual situational or contextual factors that may have influenced the interview should also be noted at this time, and these may form a part of the appendix.

Respondents often return to a main theme during an interview: the so-called "red thread", and this is often developed with exceptional feeling. Here the non-verbal cues noted by the researcher in his written transcripts become an invaluable source of data for cross-checking. It takes time to distill these themes, but this affords the opportunity to

compare interviews for matching themes, and then to go back to the respondents to check the accuracy of the findings, and to see if it makes sense to him/her. Often, fresh data may be gleaned, when checking back like this, that are highly pertinent and informative.²

Care is needed, however, in the form of check adopted. Normally, the main points are written out on a standard note to the respondents, which asks them to confirm or reject the contention that the researcher has grasped what the respondent said during the interviews.

Peer Debriefing

Peer de-briefing sessions should also be initiated at this stage. The researcher asks his peers to go over the analytical notes and/or the reflexivity journal to help in the identification of blind spots and/or methodological and theoretical limitations. This team approach enables the researcher to have access to a variety of viewpoints. Evaluation from peer de-briefers is seen as positive criticism, which necessitates that the researcher come to grips with the concept of "embracing error" (Michael:1976).

² This often occurs 'off the record', when the interviewer is preparing to depart, a concept described as 'going out the door'. Preparation is made in advance, for note taking immediately subsequent to the interview, to accommodate this contingency.

The assessment of major differences between the researcher and the peers often leads to new insights, and helps in the next stage of the project, which is the analysis section. All the while, the insights gained from all the sources are being fed into the reflexivity journal, which by now has become a major tool for developing an awareness of the problems that the study has uncovered, and of making changes in the researcher's mind-set and thought-world; it is dated for the purposes of auditing.

At this stage, the researcher has begun to develop hypotheses, and the formation of frames of reference begins. These may be explored at the next peer de-briefing session, and may also help the interviewer when it comes to the next interview.

ANALYSIS OF THE INTERVIEW MATERIALS: STAGE II

The second stage of analysis involves the comparison of tapes and notes from different interviews. Notes from peer de-briefings, respondent checks, and the reflexivity journal are added to the analysis. As the different interviews are analyzed, commonalities begin to emerge. A list of themes is then developed, which attempts to encompass all the topics that have been uncovered in all the interviews.

Once a maximal list of themes has been organized, there are several techniques that the researcher can employ to analyze what is occurring. Matrices are a very valuable tool in this process, and the plotting of themes on a matrix

helps to sort out who said what, with how much emphasis (cf. Miles & Huberman: 1984 & 'Theme Development' below). Other methods of analysis, such as the Person-Card Technique, (Hibino & Nader: 1980) are very helpful in synthesizing what often proves to be very chaotic data. The P.C.T. is a manual version of the non-parametric cluster analysis technique. Computer algorithms for this task using non-numeric data remain weak as yet, but the theory of Fuzzy Sets is proving promising.

Scheme of Interpretation

Additional readings, as follow-ups to the interviews and peer de-briefings, help in the development of concepts, to give a grasp on the material, and of patterning devices, to help form interpretive schemata.

From the constant comparison of all the different notes emerges a 'scheme of interpretation', a semi-theory rather than a concrete one. High levels of generalizability are readily available from small samples when thick descriptions are used. For instance, if 29 out of 30 cases in a purposive sample show some particular phenomenon, it is highly probable that this will be a common property of all similar samples. That is, the phenomenon is a characteristic of such a sub-population.

If, however, a contrasting sample with other similarities does not show this phenomenon, then the phenomenon becomes

an identifying property of the sub-population. That is, the phenomenon has been shown to have a correlative link between its occurrence and the other distinguishing characteristics of the demographics or ethnographics of the sub-population.

Triangulation

Once these patterns are apparent, it is necessary to check the findings by employing data from other sources; this concept is known as triangulation, and is employed since self-reports are notoriously unreliable. The reason for employing triangulation techniques is obvious. Since interviews, or any other method, involve their own biases and skewing (as do investigators), findings which also turn up after using different research methods command credibility.

ANALYSIS OF THE INTERVIEW MATERIALS: STAGE III

Phenomenon Recognition Check

The interviewees are offered a choice between various reconstructions of their points of view on PCs in the home. This is done by showing them various schemes of interpretation derived from different analysts' use of the person card technique on the interview data. Careful notes are taken on their reactions to these reconstructions. This is the point at which new insights into the interviewees' thought worlds are particularly likely to occur and it is even possible that new features may have to be incorporated into the research design.

Final Reports

Finally, the researcher is able to prepare the final reports. These will require several different formats, depending on who the audience is that will read the study. For the final report, then, at least three types of drafts will be prepared:

1. To the collaborators (usually a model profile).
2. To interested third parties (usually a structured activity).
3. To the authorities (eg.-thesis, major paper, committee briefings, etc...).

Then, it is possible to feed the reactions from (1) into (2), and from (2) into (3). This check on reactions serves as yet another control on the researcher's reconstruction of his collaborator's thought worlds.

Audit Trail

An audit trail is designed to make the raw data and working methods of any piece of new paradigm research available to anyone who wants to check the data and methods. The audit trail is designed to provide evidence that:

1. Data exist in support of every interpretation put forward.
2. Interpretations have been developed in ways described in, and consistent with, the data produced by the study.

3. Changes to the propositional inventory are identified and accounted for, and resulting changes in the research design have, in fact, been carried out.

The audit trail makes it easy for those who read such a study to see how formative evaluation was developed. Typically, the project ends up teeming with bright ideas and unusual insights, since many minds have shared in the study.

Another essential value of the audit trail is to enable replication as a means of cross-validation. Replication is the most valuable test for of transferability in naturalistic studies. When other researchers independently make essentially the same observations, then there is increasing support for the construct.

Chapter III

PROPOSITIONAL INVENTORY

BIBLIOGRAPHICAL BACKGROUND TO THE CURRENT STUDY

The initial desire to study the effects of personal computers in the home began in 1981. At that time, personal computers were a novelty to most Canadians, and the home market had just begun to open up.

After reading Toffler's The Third Wave (1980), an interest in the concept of the electronic cottage began to develop (1980:194-207). In the fall of 1982, after acceptance into the Graduate Program in Communication Studies, a search of the literature was undertaken to determine what scholars and futurists in the field of personal computers in the home were envisioning for the future. Meanwhile, as the debate about PC's in the home raged on, the practise of PC use quietly and quickly began, among ordinary people in society.

After a careful synthesis of the literature throughout Graduate School, it became clear that there were at least as many problems as insights resulting from the concept of the electronic cottage (Edwards; 1983). The one fact that seemed to be abundantly clear in this report, however, was that little in the way of empirical research was being conducted into what effects the PC was having on homelife, since the

concept of the electronic cottage was being practised by a very small and elite population. Therefore, studies that would actually involve PC users seemed to be likely to be of great importance to both researchers and practitioners in the new field of computers in the home.

Several studies seemed to be helpful in pointing out what a scholar analyzing the effects of PC's in the home might uncover. Four works in particular stood out at that time: the research of Hiltz & Turoff (1981), the writings of The Center for the Study of the Future (Nilles:1982), the work of Masuda (1981) in Japan and the research of the Science Council of Canada (1982). Many other studies were being conducted in Sweden, France and the United States, but these were either incomplete or unavailable (see discussion on Networking in appendix). A picture of the future of a society dominated by computers began to emerge, and one fact seemed very clear: the future was already here!

As stated, it was Toffler who popularized the term "electronic cottage" (1980: 194-207). Toffler's views were quite Utopian in nature, and he proclaimed that PC's in the home would be the key to creating a more unified family. He envisioned a society where large segments of the workforce would stay at home and "telecommute" (Nilles:1982) to work. This would lead to a greater bonding of the family, he continued, as everyone would be together in the home all the time. He added that:

"...bonds in the home and the community could well be strengthened by these new technologies. Computers and communications can help us create community" (1980:372).

This view was both supported and rejected by a wave of articles and books that quickly followed Toffler's treatise (Boraiko:1982; Time:1982; Friedrichs:1982; Business Week:1982; Kieran:1982; Levy:1983; Paddy:1982; Post:1982; Sharpe/Collins:1983; Thomas:1982; Naisbait:1983). One recent study actually involved an empirical study, interviewing workers who were telecommuting to work every day (Pratt:1984). Other research focused on the energy savings that would occur, since employees wouldn't have to drive to work everyday (Nilles: 1976;1982). Still others examined the effects that networking would have on organizational structures (Martin:1979; Report on Telecommunications in Canada: 1972; Freidrichs/Schaff:1982; Forester:1982; Coates (no year); Paddy: 1982; Thomas:1982; Dotto:1980; Gctlieb: 1978; Matthews:1983). Many of the findings of this research will be presented below.

It was the introduction of the PC into the home environment, however, that seemed to capture the imagination and stir the most controversy. It seemed to many as if the phenomenon of PC's in the home had happened overnight; theory and practice began to blur. Thus a topic worthy of investigation would be useful to determine what the users were experiencing, and what impact the PC was having on familial relationships.

The Personal Computer: A Very Brief History

The development of the personal computer was spurred by the invention of the Intel 4004 micro-processor in 1971 (Nilles;1982:15). In the earliest days of computers, (c.1945),³ vacuum tubes were employed to control and amplify electronic currents (Baraiko:1981). The transistor, invented by William Shockley in 1947 (for which he received the Nobel Prize), solved the main problem of the vacuum tube, which often had to be replaced due to burn-out. But the early transistors also had flaws, and the solution, developed independently by Jack Kildy at Texas Instruments and Robert Noyce at Fairchild Semiconductors, spurred the concept of the integrated circuit, or the "chip".

The development of the chip and the Intel 4004 will probably be viewed by future historians as one of the pinnacle achievements of the 20th century. The chip could be developed cheaply, allowing many of the functions that control a computer to be enclosed into one tiny area. Hence, the increasingly powerful personal computer became possible; this was creatively realised by the Apple Computer Corporation, with the introduction of the Apple II series; today, computers have become such an obvious fact of life that it seems impossible to imagine how we could survive without them.

³ A complete history of the growth of the computer industry is available in Nilles:1983.

The first home computers were able to employ the updated Intel 8086 microprocessor in 1978, but early computers for the home were available in kit form as early as 1974. Today, estimates vary as to how many PC's have been sold in the world. The Royal Commission on Newspapers has noted, however, that the personal computer remains a distinctively American development (Desbarats; 1981: 41). However, the Japanese are beginning to make inroads into what has previously been a virtual American monopoly.

Here in Canada, computer sales are increasing; more and more families are buying PC's for use in the home and at work. Exactly what the effects of this trend will be has yet to be fully realized. It was in this environment that the current study was initiated.

Hard figures on total personal computer sales since their introduction are difficult to obtain. However, Steven Jobs, President of Apple Computers, has stated that there have been over 2 billion Apple Computers sold since their introduction in 1976. This figure would not take into account the sale of "clones", which are near duplicates of Apples (Sheff; 1985: 50).

Another source (Futurist; Aug, 1984) noted that one-fourth of all US households now have at least one member who uses a personal computer, either at work or at home. Further, it was added that people who use computers at work are twice as likely to own personal computers as those who don't work with them.

Apple Computers: An Amazing Success Story

Since the user-respondents of this study all own Apple Computers, and the users group that was surveyed was an Apple Club, it is worth noting the short yet fascinating history of the Apple Computer Corp. Apple was the first company to really open up the home market of personal computers, and in 1984, the corporation's net earnings were expected to be around 1.5 billion dollars.

In 1976, two friends, Steven Jobs and Stephen Wozniak set out to create a computer of their own. In their spare time, they designed and built a makeshift computer, which was simply a circuit board, and called it the Apple 1. They added a keyboard and memory, which allowed the machine to store some information. However, the development of the cheap and efficient disk drive by Wozniak (a device that reads and stores information permanently) and the addition of the video terminal was what gave birth to the Apple II. When the program 'VisiCalc', a spreadsheet program, was introduced into the market, the PC boom began in earnest.

The growth of the Apple Corp. and its dominance in the home computer market was meteoric. From sales of \$200,000 out of their garage in 1976, Job's Apple has grown into a huge corporation, and seems to be solidly entrenched in the personal computer market today.

However, there have been many bankruptcies in the short history of the personal computer. The Apple II, II+ and IIe

lack power but are suitable for many home applications. The Apple Macintosh lacks the flexibility of the earlier Apples, which was so appealing to Apple users. If Apple Computers kills off its 11 series prematurely, it may also kill itself. However, given the level of expertise that exists within the Apple Corp., this does not seem to be a likely occurrence.

IBM entered the personal computer market in 1982, and with their IBM PC, they were able to capture around 30% of the market and to create a new standard for personal computers. In 1984, Apple released the Macintosh, a revolutionary concept in computer design, which allows the novice to begin applications almost immediately. While the IBM PC is very difficult to master, the new Macintosh's system employs a device called a 'mouse'- a little box that rolls around on the desk and guides a pointer. When the user points at certain icons, such as a picture of file and presses a control button, the unit will automatically file the data.

In 1983, IBM announced the introduction of their PC Jr. IBM's strategy was to try to capture the lower end of the home computer market, mainly dominated by Apple, Commodore and Tandy-Radio Shack. The PC Jr. was plagued with problems, and recently, IBM announced that they were discontinuing production of the PC Jr., which would seem to be a boon for Apple, Commodore and Radio Shack.

Apple is manufacturing Macintoshes at the rate of 40,000 per month, and expects to double that figure this year (Sheff;1985:50). It may be a fair statement to note that: "...the Mac is certainly the least threatening computer ever built" (Sheff;1985: 50). Since the Apple Corporation has targeted education as its newest market, and has increased its power and flexibility for the Macintosh, it seems safe to suggest that educators can expect to see more Macs, and Apple products in general, invading the classrooms in the future. This course of action is important, since users tend to develop loyalties to the operating system upon which they learned.

Computers in the Home: Initial Literature Review

The literature on the effects of personal computers in the home covers a massive amount of territory and topics. While there seems to be little in the way of empirical research into the effects of PC's in the home, there is no shortage of writings and theorizing on this topic (cf-Edwards:1983).

Alienation

The topic of alienation (Baker:1979; Fromm:1968; Matthews:1980; Friedrichs/Schaff:1982; DOC: 1981-82; Ferguson:1979; Paddy:1982; Cornish:1983; Albertson:1980; Science Council of Canada:1982; Peterson:1980; Toffler:1980; Mad-

den:1979) seems to be of interest to many authors. What these writings seem to be concerned with is the fact that the PC has the power to divert the attention of the user from the rest of society. Such writings are usually full of a sense of foreboding, often describing nightmarish projections of a society in which electronic communications replaces human communication as we know it. Science fiction novels such as Isaac Asimov's The Naked Sun and E.M. Foster's story The Machine Stops are examples of scenarios of this type of future (cf. Tassel:1977).

Of course, the topic of alienation is not a new area of debate among scholars, especially social scientists of the 1950's and 1960's. The concern at that time was the passivity and the debilitating effects of boredom, and the hostility and violence produced by alienation. However, computer-based alienation is different; the PC is attention grabbing and mind-expanding. Computer users are neither passive nor hostile; they are absorbed.

This brief paragraph from the Science Council of Canada exemplifies the debate of computers and alienation:

"...the new technologies have the potential to increase alienation and a sense of powerlessness prevalent in our society. Alternatively, they can be configured in such a way that social interaction can be increased and facilitated." (1982:49)

Potential Beneficiaries of PC Use

The disabled were often mentioned as potential beneficiaries of the computer revolution. It is felt by many (Nilles:1982; MacDougall:1981; Hiltz/Turoff:1981; Faflick:1982; Cornisa:1983) that the PC could be a great tool for boosting self-esteem and providing job opportunities for the disabled, by allowing them to work from their homes. Several interesting experiments in the United States are providing the groundwork in this interesting area of research (Faflick: 1982:66).

The elderly would also stand to benefit from PC's in the home, claim Hiltz/ Turoff(1981:176). They feel that many of the elderly who are retired could provide valuable services to society, due to the training and skills that they possess. Of course, problems inherent with computers vis a vis the elderly, such as trying to read 80 columns of tiny characters on a screen, still have to be resolved (already, there 24 inch monitors which can produce one inch high letters on the market).

Costs and Their Consequences

A central theme which seems to attract a lot of attention is the cost of purchasing a PC. As anyone who has attempted to purchase a unit will attest, these units are not inexpensive. The drastic reduction in price of the PC seems to be a myth, as computers still remain expensive, except for out-

dated equipment. Besides, the purchase of peripherals and software usually doubles the cost of purchase of the microprocessor itself, and updating software continues to be a heavy expense thereafter. A key issue thus becomes: will poorer segments of the population, unable to afford the huge cash outlays required to purchase expensive hardware and software, have access to computer knowledge? There is growing concern on the part of some researchers who claim to have evidence that tends to support the belief that computers are basically a tool for the rich (Peterson:1980; Weizenbaum in Dertouzos:1980; Cater:1981; Toliver in Matthews:1980; Hiltz/Turoff:1981; Campbell in Matthews:1980; Wicklein:1981; Hogrebe:1981; Freidrich:1983; Fishman:1981; Nilles:1982; Science Council of Canada:1982; Cornish:1983). The gist of these writings state that the rich normally embrace a new communications medium long before the poor. When there's a lot of technological development in that medium, then the gap progressively widens between the rich and the poor, as the latter lag in taking up and getting access to each succeeding step. Exactly what the implications of this development are for policymakers and researchers in this area remains unclear.

A direct relationship to the concept of "information have-nots" is the fact that some school districts will not buy computers for their students, due in large part to the area that they come from. What does this portend for the fu-

ture, since most academics believe that computer skills are going to be a necessary tool required for placement in the workforce? What are the implications for educators and government officials? States Wicklein:

"...it should not be too much to ask of a nation that has telephones in 98% of its homes to make home communication sets possible in 100%." (1981:253)

In the education system, it is becoming increasingly evident that access to computer proficiency is becoming a serious problem. By now, it had become apparent that what had been the initial literature-based image of the electronic cottage, and what was pragmatically occurring in the early experiments with this concept, were creating a sense of misgiving and a feeling of unease with the literary extrapolations.

Impact on Intra-Familial Relationships

When examining the role of the computer vis a vis the family, there seems to be some concern about the effects that the PC is having on familial ties. On the one hand, some feel that PC's in the home will lead to a greater bonding between father, mother and child. On the other hand, there are those who feel that the computer may lead to greater problems in what many feel to be an already tense situation of trying to keep the family together. A brief synopsis of these statements will now be presented.

Toffler suggests that the concept of the electronic cottage could lead to more intimate family relationships. He senses that 'love-plus' relationships could develop:

"Those who look ahead to working at home with a spouse are likely to take more into consideration than simple sexual and psychological gratification...Love-plus consciousness, responsibility, self-discipline or other work-related virtues." (1980:217)

On the other hand, practitioners of working at home have expressed the feeling that it is very easy to get "attached" to the PC. The advent of computer "catatonia", (Nilles;1982:87), or the ability of the PC to mesmerize those who interact with it, may prove to be a very real strain on families. The phenomenon is very similar to what has been called "golf widows", where husbands often spend the week-end on the golf course.

In the US, where computers have been in use the longest, reports of computer addiction were first provided in detail by Weizenbaum (1976). The computer becomes the center of the users' lives, and, adds Nilles:

"Compulsive computerists can be swept into divorces from reality through sophisticated computer programs that could be as effective as the use of various drugs, although computer addiction might be a more benign disease than alcohol or drug addiction". (1982:180)

The outside world becomes a distraction to the heavy computer user; relationships seem to break down, attitudes towards eating schedules deteriorate, and more and more nights are spent working late. This phenomenon parallels Type A behav-

ious and that of the classic workaholic, which may be seen as a very serious problem.

The crucial question in this area of computer use is the level to which this aberration tends, on average, to occur amongst computer users. How do relationships stand the strains that the PC may exert upon it? This seems to be a key issue at the outset of the current study, and is one of the main reasons why heavy users were chosen as the main respondents.

Computerphobia

Contrasting the ability of the computer to mesmerize the user is the fear that many segments of the population have of computers, a dysfunction known as "terminal phobia" (Edwards; 1983:82; Knight; 1979:74; Nold; 1975:269; Rubin; 1983:55), or "compu-phobia". This problem has been occurring in the workplace, where many executives and workers seem to be intimidated by the new technologies; this is also occurring, to some extent, in the schools:

"...partly because of teachers' fears- of the machines and of their jobs- and partly because of the poor quality of the software, the frequently heralded electronic revolution in the classroom has been slow to materialize" (Golden; 1982:54).

Some children are terrifyingly bright with computers, which also threatens the teacher's authority.

COMPUTERS IN THE SCHOOLS

However, the main inhibitor to the electronic revolution is inertia. Teachers tend to establish a routine which involves an interactive presentation of a concept followed by paper-and-pencil practise in which all learners engage simultaneously. Variations in the practise activities are usually initiated on a whole group basis. To employ one or two computers in a class of 30-40 children requires major changes in routine and program restructuring. The current quality of software is not high enough to warrant such major disruptions.

Briefly, then, teachers face at least the following problems in the implementation of computers in the schools. The learning curve with computers is a slow one at the start. There are difficulties in choosing the initial hardware and software. It takes some level of skill to get through the progression through application programs once one starts. The changing definition of computer literacy creates a sense of tension, since this definition may require at least one programming language, as well as the mastery of several applications programs (word processing, spreadsheets, data base management, graphics and communications -all in the common 'integrated packages'). Hence, what teachers are experiencing is the requirement to engage in continuous adult self-directed learning (Tough:1979). The end result is an enormous investment in time and money, which causes unknown tensions to teachers.

Children and the Personal Computer

Another area that was deemed to be relevant to the current study from the earlier report, may in fact be the most important: the relationship of children and PC's. Children seem to embrace computer use very easily, often much more rapidly than do their parents. Dealers perceived that this would be a reason why parents would buy computers in the first place: namely, to allow their children to become proficient with computers. This was one way that manufacturers were able to sell television sets initially, as well.

The topic of children, computers and education seems to be receiving the most attention in the literature, and many fine institutions exist solely for the purposes of testing computer software on children. The relationship between the parents, the children and the PC has not received the same type of attention, and is most certainly worthy of further research.

Some scholars feel that the relationship between the teacher, parent and student may be strengthened via the PC (Golden; 1982:59; Freidrich: 1983:16). Whatever youngsters make of their computer experiences at home and at school, they will surely confront the world with a different mindset than did their parents. It is perhaps difficult for this generation to imagine what it will be like to be brought up on a computer from early childhood. Previously, the notion of allowing young students access to micro's seemed unthinkable; already, it is standard procedure.

Is the educational sector prepared to deal with the implications of computers in the schools and at home? In a few years time, the ability to interact intelligently with computers may be as important as being able to drive a car, to read and write, or to use the telephone system. What does this portend for the relationship between parent, teacher and student? Russell offers this interesting anecdote:

Years ago, the world was divided into those who could or could not drive a car. Today in western society, this skill is almost universal (children excepted). With computers, a reverse situation is forming: most school children have been exposed to them in schools, while most adults have never used one in their lives. (1977:14)

COMPUTERS IN THE WORKPLACE

In the workplace, some executives have a built-in fear of computers, partly due to the fact that typing is often not a part of their repertoire of skills. Besides, computers tend to erode authority, something that intimidates executives. States Friedrichs:

"...the biggest problem in introducing computers into an office is management itself. They don't understand it, and they are scared to death of it" (1983:12).

For the executive, the so-called "office of the future" (Coates-no year) puts them into a double-bind: the fear of the unknown, and the need to re-educate themselves. All around them are young 'upstarts', who threaten to force them out of their jobs. Massive re-education and training programs are being undertaken by many firms, affording the op-

portunity for senior management to become familiar with PC's (Taylor; 1982:64; Nilles; 1982:64; Cornish; 1983:136; Friedrich; 1983:12).

SUMMARY: INITIAL EXPECTATIONS

Ten Propositions

In summary, then, the purpose of the propositional inventory for the researcher was to lay down a foundation of concepts, theories, and findings, and to raise the researcher's levels of sensitivity and awareness before the study was initiated. This foundation also serves as a basis for assessing the development of the researcher's growth of awareness of the topic.*

Briefly then, it is necessary to summarize what the expectations at the outset of the current study were. Taking into consideration all the issues that were just outlined, it was expected that at least the following would be supported during the interviews:

1. People who began to use computers in the past two years may be considered as innovators, and would be from the middle to upper class strata, due to the high cost of purchasing a microprocessor and related peripherals.

* This foundation setting has in fact been quite helpful, for many of the concepts alluded to in the previous sections did in fact become important themes in the interviews.

2. Children are the main reason why families buy computers, as they try to provide their offspring with a competitive edge into the future.
3. People believe that computers will benefit them in their personal lives- i.e.- keep track of finances, sort recipes, act as word-processor, develop home business skills, etc.
4. Computers are creating a "techno-centred" society, which posits that a person begins to identify so closely with the machine that it supplies nourishment for his/her emotions.
5. To adapt to PC's, one has to plod through the manuals- a cumbersome task requiring infinite amounts of patience and perseverance.
6. Families that are able adjust to computers are able to work as a group to solve problems, or have at least one bright member that can explain to others about new discoveries and insights.
7. People who are able to adapt find it to be a very marvellous tool for the whole family to use, perhaps due to the fact that they are already bonded as a unit.
8. The head of the household rationalizes the purchase of a computer as a way to do work-at-home, while getting the children involved.

9. Non- users are waiting for the price of computers to come down, and for the user-friendliness of programs to go up.

10. Computers are very difficult to learn and require huge amounts of time to become proficient at them.

Of course, this list is not exhaustive, and it was expected that many new insights would be obtained, adding to an already rich base of information. The author was fully cognisant of the fact that many ideas could be hidden from view, because of the essentially 'literary' basis of the inquiry to this point.

Chapter IV

ANALYSIS: STAGE I

THE INTERVIEWS: INITIATING THE STUDY

How the Interviewees Were Chosen

Fifteen interviews were conducted for the purposes of this study, chosen as a purposive sample. Since intensive, unstructured rapport interviews usually require huge amounts of time to arrange, conduct and analyze, a small purposive sample was employed. A total of six (6) heavy or serious users were selected to be the main participants in this study, since the focus was on the effects of the PC on family life. All the serious users had families, since this was the area to be most explored. Serious users would have first hand personal accounts of what it was like to incorporate a PC into the home environment, and would likely have a rich repertoire of experiences to impart to the study. Families were chosen because of the problems that many researchers were claiming to be occurring in introducing PC's into the home, as was demonstrated in the propositional inventory.

The criteria for selecting the users were as follows. A wide variety of key figures from suppliers and users groups, and from the university, known to be heavily involved with PC's, were asked to name a group of heavy PC users. This

group would have families, and would probably be seriously involved in with the user support group. They would also have a reputation for some type of PC application, that only another serious user would seek, such as advanced programming. Names that kept coming up on the short list were actually selected.

As a method of controlling the sample, a matched group of people who did not own a PC was incorporated into the study. This group was chosen to coincide with the employment status of the user. For example, one user-respondent worked for the city utility commission, while the matched non-user worked for the city parks department. It was felt that by matching non-users by employment status, that the sample would eliminate finances as a reason for not owning a PC, an important criterion in the initial propositional inventory.

Participants in the research were assured of anonymity: their names were known only to the researcher and the chairman of the thesis committee. Keeping this fact in mind, a skeletal outline of the socio-economic status of the respondents will be presented, since the control group of non-users was selected according to the users job title and socio-economic status.

Who the Interviewees Were

Not surprisingly, the sample contained a number of academics: one university professor, a grade school teacher, and an academic administrator. Another of the heavy users was a computer technician for a large computer corporation, and the other two were a truck driver and a city employee respectively.

One of the respondents was a woman, in an attempt to gauge a woman user's perspective on the effects of PC's in the home. The ages of the heavy users varied from roughly 35 to 50 years of age. Four out of the six respondents would be considered to come from the upper middle class strata (\$30,000-\$70,000 per year); the other two users had salaries in the \$20,000- \$35,000 range) and they all owned their homes. All owned Apples or their clones, and had invested quite heavily in peripherals, programs and hardware.

During the interviews with the user-respondents, it became apparent that their views of how their spouses felt about the computer in the home might not coincide with the spouses' feelings. Therefore, a decision was made to include the spouses in the research design, to see if they had similar or dissimilar ideas about PC's than did their mates. Unfortunately, however, only 3 of the 6 spouses were able to participate in the study; two of the respondents refused to allow their wives to be interviewed, and a third could not due to personal reasons. Together, then, the sample consisted of 15 respondents.

How the Interviews Were Conducted

The respondents were fully briefed on the goals and philosophies of the research project. Interviews were conducted at either the researcher's residence, the university, or the participants' home or place of employment. After briefing, the tape recorder was turned on, and the main probe was put to the participants:

1. PROBE: When you think about the personal computer, and the impact that it has had on your life, what thoughts, associations or concepts come to mind?

Or, in the case of the non-users, the following was asked:

1. PROBE: When you think about the personal computer, what thoughts, associations or concepts come to mind?

The users had a rich repertoire of ideas and experiences which they could use for the purposes of discussion. Oftentimes, all that the researcher had to do was to pick up on the non-verbal behaviour, and to pay attention to para-linguistic features, to continue the discussion. When these became particularly striking, respondent was encouraged to discuss what s/he was currently saying more fully: the interviewer would ask:

1. Could you please tell me why you feel that way about...?
2. That's interesting. I'd like to hear more!
3. What led you to see things this way (or believe this to be true)?

Frequently, the conversation would lead into areas that were quite sensitive for the respondent to discuss; perhaps this was the first time that they had ever had the chance to deal with this topic in such a fashion. When this occurred, the onus was on the researcher to employ active-listening techniques, and to feedback what the respondent was saying by paraphrasing what s/he had just stated. Instead of trying to defend a pre-conceived notion, the interviewer let the respondent speak freely on a sensitive topic without threatening the notions being put forward.

Other probes were also used when the respondent had said all that s/he could on a topic. These were open-ended questions, such as:

1. If you had to teach someone about what they needed to know about incorporating a PC into the home, what ideas, comments or suggestions would you give them?
2. If you could start all over with the PC in the home, is there anything that you would change?
3. Was any incident particularly important to you in your decision to get into computer use the way that you have?

The non-users would not have the rich experience base that the user-respondents had, so they would have to be approached a bit differently. The focus was more directed, since they were used only as a method of cross-comparing the views of the users. The probes, then, followed this general line:

1. Is there any reason why you have not purchased a PC thus far?
2. Do you think there are any advantages or disadvantages to having a computer in the home?
3. What do you see a PC being useful for you today? In the future?
4. How would you feel if your spouse spent hours at a time on the machine?

The sub-probe and active listening techniques would be the same for both groups, however.

Once the interview was concluded, and the tape recorder was shut off, the respondents would oftentimes add comments as the interviewer was preparing to leave. Since the tape machine was inoperative, the interviewer paid careful attention to this conversation, and when it was finished, would rush to the car and jot down the main thrust of these valuable statements.

As soon as possible after the interviews were completed, the researcher listened to the tapes, and careful notes were made of the proceedings. Main themes of discussion were identified, and these were collapsed into categories, which could then be fed into an elaborate filing system set up on the university computer system by the researcher. Any unusual situational or contextual factors affecting the interview were also input at this time, as well as personal thoughts and reflections about the study in general.

Respondent Checks

Respondent checks were also prepared at this time. These consisted of the main themes discussed by the respondents and a brief overview of the discussion. The respondent checks were then mailed to the respondents, and a self-addressed stamped envelope ensured that the respondents would comment on the interviewers' perceptions of their feelings. Once the respondent checks were returned, any differences between the interviewers' perceptions of the respondents' views and the respondents' perceptions of these were dealt with via the telephone. Further comments on the subject could be gathered at this time, allowing for the respondents to collaborate in the project. After this stage was completed, the process of analyzing the main themes was initiated.

MAKING SENSE OUT OF THE DATA

At this stage in the analysis, it was necessary for the researcher to try to make sense out of the incredible variety of data that had been obtained during the interviews. Themes were identified by listening to the interview tapes, and by preparing transcript notes. These notes were then reviewed, first by individual respondents, and then collectively, as a group. Categories of discussion were created, and a simple, brief title was given to these.

Themes in the Interviews

After all the interviews had been analyzed, it was apparent that a limited number of themes were being discussed by all the respondents. By utilizing a computer packaging technique designed by the researcher on the universities' Wylbur System, it was possible to organize the categories of discussion into groups, to help in the synthesizing process. After the interview notes were collapsed into a series of exhaustive categories, it was determined that 18 main themes emerged as being dominant. This list, then, consisted of the following:

1. I wish my spouse were involved with computers
2. Computers are hard on family relationships
3. Computers are good for family relationships
4. Computer literacy is important to a child's future
5. Computer use is time consuming
6. Computers use is difficult to learn
7. Women have problems learning to use computers
8. User group influence
9. Computers are expensive to purchase
10. On excessive use
11. Fear of computers
12. Computers are the way of the future
13. Women need to get involved with computers
14. Microcomputers and the education system
15. Spouse is tolerant about computer use

16. Computers are beneficial to society

17. Manuals are difficult to understand

18. Computers are a useful tool

After identification of each theme was completed, and all responses classified, it was then necessary to determine the depth to which all respondents discussed each theme. While there may have been some overlap amongst themes, the hope was that each topic would contain unique features (as "Analysis of Themes", to follow below).

The Matrix

Simple cross-checking was performed to reduce the complexity of the data, following the model of Miles and Huberman (1984:175). This method provides a technique to gauge the respondent's level of discussion on a given theme. Their level is numbered on a scale from 0-4, where a 0 indicates no discussion of the topic, and a 4 signifies a full and deep discourse. It was then possible to identify who said what, and which topics received the most attention.

A matrix is a powerful format to employ when trying to make sense out of this kind of data. Initially, the matrix was set out by listing the above themes on the vertical axis. The names of the respondents were written on horizontal axis, making a 15 x 18 matrix (respondents x themes). The respondents' names were initially entered in in the order that they were interviewed. (see Figure #1)

By examining the interview notes, each theme was analyzed to gauge the depth of discussion by the respondent. For example, in the first case, respondent # 1's notes were carefully reviewed to see if s/he discussed the theme 'I wish my spouse were involved with computers'. Next, on a scale from 0-4, the depth of the discussion was measured. By inserting a number in the matrix, in square 1-1, an indicator was obtained for that respondents' level of awareness on this topic. This was repeated for each theme, and when respondent # 1's level of awareness was completed, the process was repeated for all the other respondents.

After all the themes were gauged for all the respondents, it was then possible to tabulate scores for each theme and for each respondent. Themes were re-categorized according to their scores, from highest level of discussion to lowest, as were the respondent's scores. Columns containing similar scores should be repositioned to be close to one another, and distanced from columns with greatly dissimilar scores, and the same could be done for the rows.

Findings.

Some very interesting patterns began to emerge from this exercise. Scores for the heavy or serious users ranged from 60-39, for the wives from 37-24, and for the non-users, from 27-19. What can be easily seen is a distinct classification of each group, which is an interesting phenomenon. The

breakdown of each group into categories of awareness seems to indicate that as computer use goes up, so does the level of cognisance of issues that relate to the culture of the group. A striking example of this trend is to parallel the highest score with the lowest one. The computer salesman received the highest score of all users. As stated, he is deemed to be at the center of a very bright group of serious users, and acts as an information base for new users. The lowest score was that of a non-user who had never had contact with a PC in his life, and did not associate with anyone, on a personal basis, who owned a machine. (see Figure #2)

FIGURE#2:

Intvw.#:	6	4	2	1	5	3	8	7	9	13	11	10	14	15	12
Excessive use	4	4	4	4	3	4	4	4	4	3	3	2	4	4	3
Useful Tool	4	4	4	4	4	4	4	4	4	3	1	2	3	4	3
Time	4	4	4	4	4	4	4	1	1	2	2		3	2	3
Money Talk	4	4	3	4	3	4	1	2	1		3	3	3	2	4
Fear of PC	4	4	1	3	4	4	1			3	4	4		3	
Hard to Learn	4	4	1	3	4	4	1			3	4	4		3	
Literacy/Kids	4	1	1	3	4	1	3	4	1	2	1	3	3		2
Mate Tolerant	4	3	3	1	1	4	4	4	4		1	1			2
Woman Problems	4	2	3	4			2	4		2	2	3		2	
PC & Ed. System	4	4	4	1	4			1		4	4	2			
Futureway	4	0	3	1	2		3	3		2	1	3	3		1
Hard on Family	4	4	3	2	1				4	1	2	1			
User Group Inf	4	3	1	3	3	4									2
Family=Good			1	1	1	4	4	4	4						
Spouses-inv		1	1	2	1	4	4	2	1	1		1			1
Women Involved	4	2	3	3			3								
Benefit Society	4		2							2				2	
Manuals Tough		4	2	1											
Scores	60	48	47	42	39	37	39	37	24	27	26	25	24	21	19

A full analysis of the themes, and why they are significant to the users and non-users, will now be presented. However, it is important to note that the role of these analysis and matrix to this study has been very significant; it would have been extremely difficult to measure the levels of awareness of themes without these simple devices.

AL

Chapter V

AN OUTLINE OF THE MAIN THEMES

In this section, the discourse of the respondents will be summarized. The views that were expressed during the interviews will be briefly noted, under their respective theme categories. The categories are now arranged in the order that was obtained from the results of the multi-category analysis and the matrix (reckoning along the rows to obtain the scores). By examining the discourse, it is possible to examine the issues that arose during the interviews.

THEMES:

THEME # 1: ON EXCESSIVE/ COMPULSIVE USE OF THE P.C.

"There's a wealth of things that you can do with a computer, but everything that you do takes time."

The theme that received the most attention by all the respondents was the topic of excessive use of the computer at home. Since the computer users were picked because of their perceived involvement with personal computers, it was expected that they would have a lot to say about excessive use. A surprising finding was that many of the non-users had strong opinions about this topic, as well.

The topics of discussion by the respondents were varied in their nature. Several of the users stated that they had

managed to develop a happy relationship with their family, and they made a serious attempt to ensure that the use of the PC did not interfere with their family life. The main concept that the users discussed was that the spouse had developed a sense of tolerance about their mates' PC use, and the users tried to make a serious attempt to go on outings with the family, to keep the family together as a cohesive unit. All the users were aware of the concept of the "computer widow", and seemed sensitive to the problem.

The non-users didn't have the personal experience of a PC in the home, but were able to speak on the topic. All were able to envisage how easily heavy use of PC's could occur, but, since they didn't have real experiences to fall back on, they weren't quite sure how they would deal with this problem.

Some respondents suggested reasons why a user could become easily attached to their machines. One user stated that it was much easier to become a heavy user in the winter, due to the long nights. In the summer, the good weather enabled him to be outside doing household chores.

Another user stated that he would rather spend time at the PC than in front of the television. He stated that he used to watch an incredible amount of television programming, but found this activity to be non-productive; with the PC, he is able to channel energy into PC applications.

Relaxation was often mentioned as a measure for using PC's. Two of the users mentioned that the PC was used as an escape valve, especially after a long day at work.

The problem of trying to keep up with a machine that never sleeps was often mentioned as a real problem that could lead to overuse. Since most tasks take so much time to perform, it requires a certain amount of patience to use PC's regularly. However, one user added that the format set-up time gets reduced exponentially as one becomes familiar with computer programs.

The users were reluctant to admit that they were in the 'addicted' stage of PC use. All claimed that they were not so tied into their machine that they couldn't break away from its grip. However, the consensus amongst the users was that it was really easy to become a heavy user, after a period of time; the spouses who participated were very supportive of their mates' PC activities.

Since this theme overlaps with several other themes that will be analyzed in this section, a fuller discussion of these will continue below. There was a high general level of awareness of the problem that the users had. All respondents felt that this topic was an area that had to be reckoned with in the adaptation of computers in the home.

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THEME # 2: THE COMPUTER IS A USEFUL TOOL

"Most other hobbies eventually become boring, but with the computer, there's always something new to learn."

Users and non-users feel that the PC is a marvellous tool for performing a number of tasks. The users all feel that their purchase of the PC has been a good one, and not one of them expressed regret with their acquisition. The applications that were used by them include games, data base management, programming, word processing, computer graphics, bookkeeping, information utility access, and educational applications, to name but a few.

One user was able to complete his Ph.D. dissertation by employing his PC to research tasks. He stated that the PC is a marvellous tool for doing research and for word processing, and claims that he would never have finished the study in the deadline that he had set without it. Also, after he completed his research, he was able to continue to use the PC, to make money in other areas, and claimed that the wide variety of tasks to which it could be applied was its chief advantage (as opposed to the dedicated word processor, for instance).

Games were often mentioned as being a popular use. One user stated that he used the machine solely for game playing applications. He used a data-base management system to keep track of his 550 floppy diskettes full of games, as well.

Word processing was deemed to be a valuable application by the users. For example, a spelling helper program enabled one respondent to correct what he called "atrocious spelling". Non-users stated that word processing would be a useful application. However, one non-user stated that while learning word processing would be an asset, his secretary already typed his notes into the computer for him. Another non-user felt that the electronic briefcase would be a great tool for journalists, who could edit text and file stories over phone lines from a distance to the head office.

Computer graphics were often mentioned as a popular application. One user stated that the development of the "mouse" allowed his daughter to learn how to draw pictures with computers very easily. Although she hadn't yet learned how to read, owing to her age (5), she was able to manipulate images via icons, which made her feel very proud.

The users all had some experiences with computer language applications. While they often stated that languages were troublesome to master, the consensus was that these will become easier to understand in the not-too-distant future. The users also complained about the non-compatibility of computer systems in general.

Interestingly, non-users felt that the PC had many useful applications that could benefit their lives. One stated that a PC would be an asset to his business, especially for such tasks as providing uniformity of records, keeping track of accounting and invoices and the like. He also added that it

could replace the heavy fees that he now pays to an accountant every month.

Another non-user liked the idea of being able to purchase one system that could incorporate all her present and future needs. She stated that such a system would be able to provide TV viewing, computer applications, allow for the retrieval of information utilities, and to play arcade quality video games. Designing programs and learning new concepts interested one non-user. He added that he would enjoy creating programs that would perform specific tasks that he desired, such as file management.

While educational applications and the role of computers in the classroom in general received a lot of attention during the interviews, these will be dealt under a subsequent heading.

THEME # 3: COMPUTER USE TAKES A LOT OF TIME

"I'd hate to think of the amount of time and hours that I've spent on the machine."

The time involved in becoming proficient with PC applications is a theme that overlaps with the concept of excessive use of the machine. Many of the users expressed the opinion that the PC was a time-consuming activity, and several of the non-users had serious reservations about how many hours would be required to become adept at PC applications.

Initially, when the PC was purchased, the usual scenario described by the users was that the novice tries to learn all that s/he can as quickly as possible. Trying to keep up with a machine that never sleeps and rarely deviates from perfect logic ends up creating a strain, claimed several users. Eventually, the user realizes that the time being spent on the unit is becoming a problem, and then, an attempt is made to modify the behaviour pattern (especially after many nights of staying up until 2-3 AM!)

Anything that you think will take five minutes usually ends up taking a half an hour, claimed one user. This results from a sense that one is trying to do a task "just one more time...". For example, another user described an adventure game that could take up to one and one half years to completely master, with steady use!

The acquisition of new software and peripherals for the unit often led the users to attempt to master them as soon as possible after the purchase. Several respondents described that when a new piece of software was used for the first time, it was not untypical for them to spend an enormous amount of time trying to achieve end goals. Time goes by in what seems to be an instant, it was added, without the user realizing that this is happening. For instance, when one respondent purchased an interesting piece of software, it was not unusual for him to spend 30-40 hours in one weekend with it. He felt that "...it don't bother me (sic)...I

just love it!". This was reiterated by other respondents, as well.

The introduction of the PC into one user's home changed the lifestyle that the family was used to. Whereas before the PC was purchased, he was always in bed by 10:00 PM; after the PC was introduced, he began to stay up until 1-2 AM, for over a year's time. Another of the heavy users added that when he looked at the clock and it was very late, he'd think: "...oh well, it's another one of those nights!" Stated a third user: "... (you) get started on it, and you just keep right on going..."

The seasons were blamed as being contributors to excessive use of the PC, as has been noted. Users stated that they spent enormous amounts of time with the computer in the winter. But, since there are many tasks that could be done in the summer, such as home maintenance, the computer was used less often. One user added that due to this situation, "...the machine suffers", putting new emphasis on the term "personal computer".

One user described how after spending many long nights with his PC, he could remember computer codes, but not people's names. Another serious user stated that the amount of time that it took to write his dissertation was reduced by half, while the final product was three times longer than expected, due to the PC's ability to improve tasks.

The time factor may also be a reason why people get disillusioned with their PC's, argued one user. Some people realize too late that traditional methods of performing tasks may be more advantageous than employing a PC to do them, such as home budgeting and recipe filing. Because the present systems are so rigid in their applications, he felt that many people get frustrated by the simplicity of making errors. While software is getting easier to use, he cautioned that until the day arrives when it only takes three pages of a manual to learn how to run a program, there are going to be problems with time-budgeting.

The non-users' opinions were not as concrete as the users' once again, since they really don't have concrete examples of what is going on in this case. However, one non-user has observed that children often become bored by the amount of time that it takes to become proficient with programs. She felt that a lot of effort was required, and this means that a child has to stick with it (perseverance is one important skill computer use can teach!)

Another non-user stated that he wasn't exactly sure how much time would be needed to become proficient, but he estimated that it must be a long, drawn-out process. He added that it would be a waste of time to play an adventure game, but wouldn't be upset if the application involved word processing or finance management.

The computer requires time and a sense of commitment if one wants to learn the applications properly, stated another non-user. He attempted to learn how to use VisiCalc, a popular spreadsheet program, at work, but found the set up time to be too long, and the learning process to be a slow one. He compared learning to use the computer to learning golf, where the novice really has to make an attempt to be good at it.

Finally, one non-user stated that any application would be time consuming. He felt that using the computer would be "...like plugging into another world".

THESE # 4: COMPUTERS COST A LOT OF MONEY /

"A computer costs less today than it did two years ago, but if money is your main concern, then stay away."

In the propositional inventory, it was stated that one of the main reasons why non-users did not own a computer was because of the high cost of purchasing a system. But surprisingly, the users were the ones with the strongest feelings about the costs of the computer; non-users, however, were able to significantly contribute to this issue, as well.

Not one of the serious users regrets the purchase of their computer system. Two of these would probably be considered innovators, having purchased their equipment as early as 1979, which is on the threshold of when they were introduced in Canada.

The rationale for justifying the purchase of a PC was described by all the users. One had an earlier hobby in photography, and claimed that this was an expensive pastime. He added that the computer was no different than this, and claimed that buying a printer for a computer was analogous to buying a lens for a 35mm camera. He stated that he was fully aware of the financial drain that the computer would have on his budget before he began to use it.

Another user stated that he bought the computer to save time in doing work-related tasks. Instead of lugging the system from work to his home, he could continue a project with the second system. Since his system cost him so much money, he was a little hesitant before he purchased it. However, today, he felt that the computer had more than paid for itself in time savings, and in consulting fees made possible with his home unit.

Seven months of intensive research and planning was carried out by one user before he finally bought a PC, and he claimed that he visited every computer store from Toronto to Detroit. However, because his wife wanted an addition put onto the house, this became a serious topic of contention around the household. He said that he has been able to make money from his computer, and now his wife will be able to get her new wing on the house. He adds that for some families who have different priorities, the cost of purchasing a computer system could create a lot of friction.

One user stated that he had no problem rationalizing the purchase with his wife. Since he had always spent so much time and money on board games, he re-budgeted to allow these funds to be spent on computer games. But, at \$50 per program, he claims that he tries to ensure that he buys only the best ones; this is accomplished by reading reviews, and testing new games for software dealers in town. He added that a certain percentage of games are garbage.

At least three of the respondents were able to make money from their PC's. One is a consultant to people who are having difficulties with orientation, and also teaches basic computer proficiency. The second has clients who come to him from the private sector, seeking professional help and consultation. The third has a thriving computer hardware sales business in the basement of his home.

Most of the users had amassed an amazing array of computer peripherals and programs. One user stated that he owned over 550 diskettes, another had over 500, and a third wasn't sure, but estimated that he owned at least 225. Extra peripherals, such as colour monitors, printers, a second disk drive, modems, and add-on cards were common, as well.

An interesting equation was offered by one of the users, as well. He claimed that if one were to spend \$3000 on a computer system, by the time that a year had passed, it would be very easy to spend the same amount again on peripherals and software, depending upon the level of involvement.

Another user stated that if he were to break down an investment of over \$5000 into a per hour figure, the machine ended up costing him \$.10 per hour!

The users seemed to have a desire to update and buy new equipment. Because of the rapid changes in the marketplace and the reduction in price of many expensive pieces of hardware, what was once prohibitive becomes affordable. The users would fantasize purchasing hard disk drives, sophisticated graphics systems, rapid baud rate modems, and the like.

The computer salesman mentioned how many of his clients have become disillusioned with their computer purchase. Computers were supposed to be a panacea for everything in life, he said, and as ubiquitous as the car and the toilet. Many bought a system "...to be the first on the block". Today, as their expectations have decreased and their dreams of what computers could do for them shattered, he senses that a feeling of ill-will is developing in the marketplace.

Today, he continued, the computer industry is going through a major shake-up period, as sales figures for 1984 were reduced by 50% by forecasters. He felt that in five years, only 15% of the population would own a PC. He also stated that the reduction of the price of the IBM PC by 30% was an amazing phenomenon. "Imagine if GM reduced the prices of their cars by 30%, what would happen to Chrysler's."

Another user stated that a used computer market will soon be opening up across N. America. Since people are continually upgrading their equipment, the possibility of used computer lots is quite imaginable. The development of the clone market, exact replicas of famous brand computers at tremendous savings, was also mentioned as a boon to the purchaser.

On the topic of the electronic bulletin board services, such as 'The Source', 'Comp-U-Serve' and the like, the users stated that they were too expensive to be used regularly. Wives, already upset about heavy investments in hardware and software, were not prepared to tolerate heavy phone bills.

The non-users were in general agreement that the high cost of purchasing the computer was the main reason why they hadn't purchased one thus far. One non-user claimed that he would enjoy owning a PC, but that it wasn't a high priority at this time. Since he worked for a large computer firm, he hoped that he would be able to acquire a good used system in the not-too-distant future.

The continuing bankrupting and phasing out of computer lines, such as the Coleco "ADAM" and the Texas Instrument "TI 99-4A" worried the non-users. The instability of the marketplace in general, and the rapid changes within the industry in particular, were often mentioned as reasons for not having purchased a computer as yet.

While one non-user stated that he felt confident that a computer would be a valuable tool for his business, the high

cost made it difficult to justify the purchase. Since his equipment at work needs constant updating and servicing, there's not much capital left over to purchase other things. If he could only squeeze the money out of his work budget, then he would probably make the move. He also expressed concern over the fact that a computer might just sit in the corner collecting dust, as well.

One non-user felt that his children would benefit from a computer in the home, but at \$2-3000 for the hardware, he found it hard to justify the cost. Another respondent stated that he would only want a PC for word processing functions, and wouldn't want to pay for extra features that he wouldn't use.

THEME # 5: MANY PEOPLE ARE AFRAID OF PERSONAL COMPUTERS

"At the beginning, I was scared that I wouldn't be able to learn what I would need to know to get involved with computers"

While many of the users feel confident with their machines, initially, several stated, they were hesitant about computer use. Non-users stated that the computer could be an intimidating tool, and both groups agreed that computer phobia is a common phenomenon in today's society.

Several interesting patterns emerged when the discussion focused on fear of computers. Initially, even the most proficient user was scared of what computers symbolized to him. He began with enormous fantasies about what the computer

could do for him. He added that the fear of failing to learn how to properly use a computer caused many anxious moments during his education with the PC.

Women have an innate fear of computers, claimed several respondents. They continued by saying that they have observed women who will not have anything to do with computers. One respondent thought that this fear could be grounded in the fear of failure. The computer salesman added that women usually have to be coerced into using a computer, while most men will at least try it out. Another respondent stated that most women have been steered away from anything mechanical throughout their lives, due to societal pressures, which compounds their fear.

Many users bought the computer with only one application in mind, and were too intimidated to try anything else, claimed a respondent. The users group has been a valuable asset to these people, since a meeting of PC enthusiasts provides a forum for the discussion of new applications. Computer dealers were quick to perceive that the users' group would be a unique vehicle to use to help get beginners over their fear of the technology. Even many non-users go to the meetings, he continued, to help to get over the fear of computers. "People show amazement when they see what it does...it almost sells the machines."

Men in their 50's are currently panicking in society, for they fear that the advent of the computer will cause them to

lose their position and power within their organization, stated one respondent. Most of the young men with degrees being hired today have some computer background, and executives feel intimidated by their lack of knowledge. He added that their chances of becoming proficient with computers is very good, for they are motivated by their fear to learn how to use the machine.

Many teachers fear the advent of computers in the classroom, for some children have a greater knowledge about the systems than the teachers do, claimed a respondent. The fear of replacement by the machine, of children who know how to program in advanced languages, and the fact that computers are not a part of their teaching background all create a sense of anxiety in the classroom. Teachers are expected to know everything, stated another respondent; everyone in the educational sector seems to be scrambling to get to know how to use a computer, and a sense of confusion prevails. This tense situation is heightened by the fact that the teachers have no idea where the computer fits into the curriculum, for, as yet, little in the way of guidelines exist. While this fear seems to be very real amongst many teachers, she added that it is not something that is being talked about very much today.

One non-user feared the general level of computer infiltration into society. She was worried that every aspect of her life is being controlled by a computer. Since she

thrives on independence, she feels that the computer is causing her to lose this important feature. Another respondent felt that his fear of computers was grounded in the issue of privacy; he thinks that the computer is causing many citizens' rights to deteriorate.

THEME # 6: COMPUTER LITERACY IS IMPORTANT TO A CHILD'S FUTURE

"Every parent that can afford to buy a system should get one for their children."

A majority of the respondents had families; their children varied in ages from less than one year to over twenty two. This probably accounts for the richness of the discussion on this theme.

Children were often mentioned as being the main reason for buying a computer system. In almost every case for the users, the decision to buy a computer was grounded in the fact that their children would be growing up in the age of microprocessors. The notion was that a computer in the home would give their child a head start in life. Users who had daughters felt that they would like to see their children break down traditional stereotypical roles, and that computer skills could help in this quest.

Other users felt that this issue was not only a rationale for purchasing a computer, it was an essential reason. Non-users felt that if it became evident that the lack of a PC in the home was creating a deficiency in their child's

learning process, then they would not hesitate to purchase one.

Being able to continue what their children learned at school in the home was an advantage often mentioned by the users. In the home environment, skills could be improved, and for older students, school notes could be input into a word processing program, and act as a form of review.

Most respondents felt that their children were entering into an era where the computer would be a dominant fact of life. Everyone will need to know how to use a computer, claimed one mother, and these skills will be necessary for acquiring a decent job. If they are able to understand how a computer operates at an early age, it may give them an opportunity to de-mystify the machine, claimed one respondent.

In the educational sector, two respondents felt that their children were benefiting from micro's in the classroom. For special education, computers improve thinking and reading skills. Languages, such as English, could be easily taught to foreign students. Programs such as Master Type force children to learn how to type, an important skill in the computer age. The introduction of icon recognition machines, such as Apple's Macintosh, offer great potentials when used by children, stated another user.

Just the fact that young adults can interact with computers and can understand its languages could be a real advantage in the job market, claimed another user. The PC is the

world's greatest tutor, argued another, for it never puts the child down, is very patient, and re-does the lesson over and over.

THEME # 7: SPOUSE IS UNDERSTANDING ABOUT COMPUTER USE

"Realize that frustration and anger are going to be a part of getting used to having a computer in the home"

The ways that families cope with the introduction and continued uses of a PC in the home were of some note. Since the PC may often become an obsessive form of behaviour for the serious user, the methods used by the spouses to respond to this behaviour have an important impact on the user's life.

Most of the serious users' spouses have developed a sense of tolerance with their mate's pre-occupation with the PC. Several of the users felt that the spouse was in fact happy that they had found such a rewarding outlet for their creative abilities.

One couple began initially by working together with the machine. In the early days of PC's, one of the easiest ways of obtaining programs was to input them from the back of computer magazines. In one situation, the spouse would read the codes while the husband would input them into the computer. She stated that there has been a lot of emphasis on the negative aspects of computers in the home lately, and thinks that the computer has been beneficial to her and her

spouse. She added that at least he's home with the family, and if she needs him for something, she knows where to find him. This idea was reiterated by other user's wife, as well.

One serious user felt that the reason why his wife was so tolerant with his long hours on the machine was due to the fact that she came from a long line of educators, and was used to dealing with deadlines, which usually required intensive work sessions. Another spouse stated that she realized that the PC fulfilled her spouse's need for self-actualization, and understood the value that it had for him, and what it means to his life. She added that this knowledge helps her through periods of loneliness, for the feeling of him being there in body and but not in spirit, could be "...the loneliest feeling in the world."

Non-users who spoke on this theme didn't seem to think that their spouses would mind them being on the computer for hours on end. One stated that his wife wouldn't care how much time that he spent with the machine, as long as he was at home. He added that it would be no different than if he was tinkering in the garage with his equipment.

THEME # 8: COMPUTERS ARE DIFFICULT TO LEARN

"You have to have a commitment to learn, and to be able to devote a lot of time to really get anywhere with it".

Becoming proficient at computer use can often be a frustrating experience. The users all related their experiences

in the learning process during the interviews. The main stumbling block for beginning seems obvious: the user has to know how to type.

Logic was also mentioned as an important requirement for using PC's. The person that can't think logically can't use it properly, claimed one user. This was reiterated by another user, who claimed that his background in engineering enabled him to grasp both abstract and practical concepts quite quickly, an important skill in learning how to use computer programs.

Two users felt that using the computer was analogous to learning a new language, such as French. Once you unlock the key to it, you begin to appreciate the logic of the thinking that went into it. Like walking in a foreign land, the computer comes complete with new symbols and attitudes. The best way to learn, they felt, was by repetition and contact.

An informal network that can be relied upon in difficult moments is crucial in the learning process. This may be witnessed with the users, who all knew each other, and helped each other during a crisis with a program. One user developed a program called Apple Help, designed to help beginners become acquainted with with the Apple System. This program was created in reaction to the problems that he encountered when he tried to learn the system, such as glaring errors in manuals, which caused untold anguish.

One user taught himself how to use a very complex word processing program called Gutenberg. Frequently, he had to call the program designer in Toronto to get further information not found in the manual. Such experiences are not uncommon in the quest of learning more about a program, he concluded.

Several users mentioned that they had to reach a certain point in the learning process, the "getting over the hump". Once this was achieved, everything started to fall into place. The concept of obtaining "end goals" was described as a rewarding experience, when the unit starts to do what one wants it to.

Advice was offered to non-users by the computer users. Since learning can often be such a difficult experience, they recommend getting some good training, for it is very difficult to teach oneself. Try reading the systems' manual from page one, they add, and join and attend a users' group meeting and ask a lot of questions. They also state that one should not expect to get much help from the computer salespeople, who were deemed to be useless in the learning process, because of their perceived lack of expertise in the field.

The future looks promising for novice computer users, according to the users. The concept of the mouse drew excited praise, and they felt that a new user could get going quite easily with a mouse-type computer. Talking computers will

soon be available to guide beginners through a new program. In the meantime, however, the learning process was deemed to be a slow and difficult one.

THEME # 9: WOMEN ARE HAVING PROBLEMS WITH COMPUTERS

"Women perceive it as technical, and therefore, they can't learn it."

One of the more interesting themes that received attention during the interviews was that of the role of women vis a vis PC's. This topic has not received much of attention in the literature, so it was noteworthy that respondents were interested in this topic.

Out of a user group membership of over 125 computerphiles, only seven are women, stated the founder of the group. To many of the users, the question of why there are few women involved with computers was one that troubled them; they expressed a desire to learn more about this theme.

Perhaps peer pressure plays a part in dictating that women won't be interested in PC use, claimed one user. The educational system has placed women into certain stereotyped roles in the past, he continued, and learning technical skills was frowned upon by the last generation. While this situation has changed to a certain extent today, stereotypes of what the role of women should be still remain.

Two of the respondents have daughters, and these young ladies have embraced the PC without any difficulty. However,

one non-user stated that in the high schools, very few young women seem interested in learning about computers. One user stated that the reason why this occurs is that there are so few machines per student that a competitive nature develops for their use. Boys tend to dominate the machines, since they are generally more aggressive than the girls. Another non-user added that men play the game 'Trivial Pursuit' more than women, due to that game's competitive nature; she felt that this overlapped into computer use by women.

Several respondents claimed that the mechanical requirements of computer use tended to turn women away from the unit. The appeal of PC's is more towards people who enjoy using this part of the brain, added two users. Since the activity is seen as being so mechanical, it may take a whole generation to change the pattern of use, stated another user.

Initially, the advent of arcade video games appealed almost exclusively to men, who could crush and devour little creatures on the screen, stated one non-user. Females become bored with this concept, and little of the software being programmed today appeals to women's tastes. Another user added that this lack of software designed especially with women in mind created some serious problems in the marketplace.

One non-user who has witnessed the forced incorporation of computers into offices noticed that it was the older wo-

men who were having the harder time adjusting to micro's. Some retain a real fear of the machines, even after the company spends many hundreds of dollars on training.

THERE # 10: MICRO-COMPUTERS AND THE EDUCATION SYSTEM

"The Separate School Board is living and dying with the Commodores...you can't replace too many machines too fast."

When the discussion focused on micros in the classroom, many interesting insights were obtained. Many of the advantages that computers offer to students were described, as were problem areas. Interestingly, several of the respondents had concrete policy statements that they felt their board should initiate; these will be outlined below.

When speaking of the positive ramifications of micros in the classroom, one user stated that students could produce exceptional notes at any level with a PC. The computer is a wonderful instrument for tutoring, especially in drill exercises, stated another. A non-user speculated that in the near future, portable computer briefcases will begin to infiltrate the classroom, much as the pocket calculator did in the late sixties and seventies.

But it was the faults of the educational systems that received the most attention from the respondents. Most of them felt that the computer has been implemented in a rather haphazard fashion in schools at every level. At the university level, for instance, one user felt that the PC is not only a

valid and useful tool for doing research, it is also a necessary one. But he stated that since most of the funding committees are chaired by Humanities professors, it is extremely difficult to obtain funding to purchase PC's to do research. Certain professors think that the PC is useful only for game-playing and the like. He concluded that media presentations on the utility of PC's has actually hurt the decision to grant funding for PC's, since most portrayals are trivial in nature.

A graphic illustration of the problem of trying to use a PC for research was described. A paper for a Business course was text-edited on a word processor, and submitted after being printed out on a dot-matrix printer. The professor rejected it, declaring that the text was unacceptable, because it was printed by dot-matrix. The respondent, who is a professor himself, stated that: "... this reinforces the attitude that university professors are out of touch with reality."

Another felt that the computer should be used by all university students. He speculated that a PC could easily cut the time involved in writing papers, and in preparing class notes. He suggested that the university begin with a plan to purchase PC's in bulk orders, and pass the incredible discounts that would be realized on to the students. Also, he argued that any student should be able to access the main-frame terminal from the home during specified hours. He

warned that if educational institutions failed to perceive these needs, upcoming young students will begin to demand these rights by the time they reach university level, due to their level of awareness. He added that it would take a progressive attitude to forecast these developments, and that Windsor seems to be lacking in this area.

One user was able to set up a very successful consulting service in this area. He realized that the educational institutions were not offering beginners any courses in personal computing. He was able to get St. Clair College involved in his project, and has taught a fairly large group of people computer proficiency skills. He also offers a free class at the Windsor Library for beginners. He stated that he has noticed that while most of the owners seem to be of a higher SES, he feels that there is a non-correlation between one's educational status and the ability to learn to use PC's.

At the elementary and secondary school level, many of the respondents stated that schools were having a difficult time incorporating micro's into the classroom. One complaint focused on the limited amount of capital available for computers in the classroom. One school board distributes PC's on an ad hoc basis, and one user involved with this problem stated that a form of game playing ensues. It is often necessary to ask for more than one wants, in the hope of getting a minimum of hardware.

Another board is caught with the dilemma of sticking to one make of computers: the Commodore. While this company was the first firm to target sales to the educational sector, they have fallen behind other systems in such areas as disk drive systems, claimed one of the users. Obsolescence wreaks havoc on the school board budget, stated another respondent, especially in an area like the personal computer.

One school received their computers with absolutely no guidelines on how to use them in the classroom. For instance, the software that was deemed to be valid was often poorly chosen, it was claimed. Programs recommended by members of the user's group often turned out to be more serviceable. Since everyone is trying to learn how to use the systems at the same time, and everything is so new, it seems to create a sense of confusion.

Another user stated that the Canadian educational institution as a whole should see the value of PC's in the classroom, especially for word processing applications. Since many students are beginning to demand access time at school, this factor would lead to a greater development in students' abilities to understand logical thinking, it was posited.

One non-user, who often has to oversee children using micros in a classroom situation, observed that many students see computing as game playing; this tends to lead to the use of programs that offer instant feedback. She added that instant feedback is not how traditional methods of teaching

operate. After the children are exposed to PC's, they easily become bored with traditional lessons. She went on to question whether or not this was symptomatic of the so-called 'TV generation', where programming seems to be done for 'instant gratification'. She fears that schools are beginning to embrace what she deemed to be 'fast-food education'.

Teachers seem fearful of computers, as several respondents have already stated. One suggestion for conquering this fear was offered by a non-user. He felt that workshops and in-service training for developing computer skills would be useful, and that a strong resource center would help in problem-solving. The feeling was that many times, the educators were not fully aware of the potentials (and pitfalls) of the machines.

One user hoped that the amount of money being spent by some institutions on micros wouldn't be wasted. Since so many teachers seem to be unprepared for PC's in the classroom, the units may fall by the wayside. One board won't allow students to do any programming with the schools' computers, and the respondent felt that this creates an unnecessary tension between teacher and student.

Students should learn typing skills by Grade 5, stated a user. The reduction in human contact by interfacing with computers worried another. The feeling was also expressed that there seems to be too much emphasis on 'high-tech' in the schools today, with little regard for the consequences.

THEME # 11: COMPUTERS ARE THE WAY OF THE FUTURE

"They are becoming such a big part of the educational system that it would really be to the child's advantage to be able to come to home and continue what they learned in the classroom."

Many of the respondents felt that the personal computer would take on a larger role in day to day living in the future. Some felt that the PC was in fact a symbol for the future. The feeling among the users was that the sooner people begin to use micros, the better the chances that they will be prepared to face the future.

Today, computers seem to be everywhere in the work environment, and if you have a PC in the home, it commands credibility among employers, claimed one user. But another user felt that many buyers were disillusioned with their purchase, and, of the promise of computers in the home. Since technology changed so rapidly in the 70's, especially in the area of high technology: "High tech (is) the dream where anything could happen, could be invented...". Unfortunately, the systems are difficult to master, as has been noted, and a "lot of ill-will has developed."

Non-users saw the PC as the way of the future, as well. Several stated that if it became apparent that their children were suffering a deficiency due to the lack of a PC at home, then they would be forced to purchase a PC. Most, however, stated that, for their children, the computer would come to dominate their lives in one form or another.

One non-user was worried about the economic implications of the computer society. He stated that Windsor is attempting to shift from a manufacturing base to a more "high-tech" oriented one. He felt that since corporations were interested more in the profit line than in peoples' health, a danger exists that high-tech pollution could become a very serious environmental problem. This concern was reiterated by another respondent.

THEME # 12: COMPUTERS CAN BE HARD ON A RELATIONSHIP

"... (he) lived, slept, breathed, and ate computers...you'd almost have to pull him by the hair to get him to come to the dinner table."

This delicate issue was mentioned by several of the users as something that they had to come to grips with. While this theme was not easily discussed by the respondents, the fact that it was discussed at all seems to indicate that a problem exists.

Several of the heavier users stated that they had managed to come to grips with balancing the use of the PC and the relationship with their families. They made serious efforts to ensure that the PC's did not interfere with family outings and the like. One user stated that he was keenly aware of the problems of alienation and the family caused by too much computer use; he felt his awareness was grounded in the fact that he was an educator. While he admitted that he often stayed up quite late working with the computer, he added

that his number one priority was to spend time with his wife and daughter.

Another heavy user felt that since he had initially spent so much time trying to master the machine, it took him a while to realize the effect that this was having on his family. Since it is not an area in which women share enthusiasm, as we have seen, lines of communication often break down. This was reiterated by his spouse, who stated that "...when he would try to share his newfound knowledge and joy with me...I don't give a damn about it."

Computers can be incredibly hard on a relationship, commented one heavy user. He stated that he was not as close to his spouse as he was before he became involved with PC's. "It can't lead to the creation of a solid relationship where six nights out of the week, the husband stays up an hour later than the wife." He added that 'togetherness' activities, such as gardening and the like, also fell by the wayside.

If the wives don't share in the enthusiasm for PC's, then all one respondent could see was problems for the marriage. Since the computer is essentially a one-on-one activity, argued a non-user, it doesn't allow for communication between a couple. Like the gambler, the drinker, and the pinball player, it is a form of obsessive behaviour, continued another.

The computer could be a way of avoiding social and familial problems as an escape valve, said one respondent. He concluded that the users seek instant gratification, which is symptomatic of the fast-paced culture that we have become.

THEME # 13: THE USER GROUP INFLUENCE

"No matter what your SES, you can rub shoulders with university professors, rich entrepreneurs, and the like...for only \$20 per year."

All of the users, and one of the non-users, discussed the development of the computer users' group as being an important feature of the computer culture. The particular users' group that was the forum for discussion in this instance was The Apple Spice Club, founded in 1982. Three of the heavy users sat on the executive of the group at the time of the interviews; all the users were members, an important criterion in their selection as participants in the study.

By joining the users' group, one member stated that it exposed him to a new group of people to interact with socially. This new fellowship allows for the exchange of different ideas and ways of thinking about computer hardware and programs. Another member stated that he enjoyed the amount of contacts and feelings of association that developed. The user group is the best thing that could happen to computerphiles, claimed another respondent, for the club helps to create a social bond.

The group has set up a public electronic information board, and many of the user respondents mentioned that they used their modems to communicate with each other, via the board. One user claimed that the modem is still in the 'expensive toy' stage. Another added that the modem could be a status booster within the group, especially if one communicates via the bulletin board.

Originally, one of the goals of the group was to help new users to become familiar with their equipment, stated one member. A network was set up that new users could access for help, and the club still receives many calls from beginners. Since it seems that many people are interested in doing more with their units, the club acts as a vehicle for learning. This was supported by the newest user, who claimed that the club has been very beneficial in her learning process. For instance, in the quest for new software, there always seems to be someone in the group who has tried out a program.

Sharing and learning may only be a small part of the reason why people join a users group, states one respondent. He feels that the club enables beginners to establish that there are a lot of people out there with the same level of expertise as themselves. The club is the analogue of the churchgoer, he added, who goes to the church and then develops a sense of fraternity and fellowship with his/her peers. This is why user groups are flourishing all over the country, for people love to be amongst those with similar interests, in a non-threatening environment.

Since using a computer is a status booster, he continued, by joining a user group, the member gets added prestige. To join a user group is a very prestigious thing to do, and one becomes 'high-tech'.

THEME # 14: COMPUTERS ARE GOOD FOR FAMILY RELATIONSHIPS

"If the wife wants to get involved, there are many ways that she can, even if she's scared. I feel sorry for any women who claims that she is a computer widow."

A feeling existed amongst three of the users that the computer in the home could be good for family relationships. While the feelings may not have been as strongly expressed as those that felt it could be harmful, the views were consistent with the users' real experiences.

The families who were happiest were those who worked together with the machine. One respondent claimed that when he used the computer with his very young daughter, the machine acted as a bonding agent. Another's son took pleasure in beating the father in games, and the father felt that this form of activity kept the son's mind active. A third respondent mentioned that when she was on the machine, her daughters would want to play with it, and asked her to buy another unit so they could do this.

One couple discovered that when they worked together to solve problems with sophisticated adventure games, that they enjoyed the time they spent together. Oftentimes, they would get so involved, that they would even dream about the

solutions, and wake up in the morning and try these out. While the wife's involvement tapered off, since she was working again, she is still happy that her husband gets so much satisfaction from the machine.

Another spouse stated that she couldn't imagine anything that would have been able to help her husband to self-actualize the way the use of the computer did. She feels that this was what he needed in his life, but was lacking before he got involved with PC use. While this doesn't mean that she loves the time that he spends on it, it does mean that she realizes the value that it has had for him, and what it has meant to his life.

Too many people spend too much time in front of the TV anyhow, claimed two users. And, they both added, at least they were at home, where the wife could see them and discuss problems.

THEME # 15: I WISH MY SPOUSE WERE INTERESTED IN COMPUTERS

"If the wives don't join the computer revolution, it is going to create further marital tensions in the future"

Several of the users wished that their spouses would use the home system. Three tried different methods to get their wives involved. One user designed a simple PILOT program to achieve this end, but his wife remained uninterested. Another asked his wife to try out versions of his APPLE HELP program, as a method of receiving input from a non-user, and also, to see if she had any interest.

Only two couples claimed that both members used the machine regularly. One was heavily involved together initially, but the wife stopped using it when she was rehired by her old firm. The other respondent's spouse used the machine, but not as often.

One spouse stated that the reason why she didn't use it was because she didn't want to feel inferior to her mate. Another added that there simply wasn't any time for her to learn, for her husband was on the machine so much of the time. She did express a desire in learning how to do certain tasks on the computer, however.

Non-users anticipated that their mates would be interested in the machines. One respondent stated that his wife was quite proficient with computers at work; he felt that she would be a user, although for what applications, he couldn't say. Another non-user thought that since his wife enjoyed using videogames so much, that she would probably enjoy using a PC.

THEME # 16: WOMEN NEED TO GET INVOLVED WITH COMPUTERS

"In this era where women are trying to gain equality with men, I can't understand why they would take a back seat to them in the computer culture."

The topic of women and computers turned up again when discussing the role of women and computers in the future. In the schools, respondents felt that many girls now have the opportunity to study the hard sciences, and many are exer-

cising this option. In the past, stated one respondent, women were expected to take more traditional courses, and to study the hard sciences would have created a lot of tensions.

In high school, very few girls seem interested in using micros, stated one user. He felt that there must be something lacking, that is keeping them away from PC's. He stated that he has witnessed how easily women seem to be able to remember computer commands and codes, due to what he perceived to be a superior capability for memorization. Girls in high schools are usually in competition "for boys". To this end, it could be disastrous also to be in competition "with boys".

Is it women's pride of having a man teach them about computers that is holding them back, he asks? Perhaps since boys are so aggressive at school and take control of the access time available on computers, that there should be a special 'girl's only' area, which would give girls the opportunity to use PC's without having to be in a position to compete for time.

Are women more intuitive and feeling, asks one user? Do they think logically, like a machine? Perhaps there are differences in the way that men and women approach a task, and computer companies and software developers haven't been able to take advantage of this, he added.

THEME # 17: COMPUTERS WILL BENEFIT SOCIETY

"Computers offer great potentials to society; conversely, they can also be the greatest threat to democracy as we know it."

While this topic was not discussed by the majority of the respondents, three of them did mention that the computer has the potential to benefit mankind and society. One user felt that the disabled and the handicapped could benefit from computers in the home. He stated that governments should take cognisance of the benefits that computers could have for this group. Since most secretaries are hired in the first place for their looks, and only in the second place for their skills, it makes it extremely difficult for the disabled to gain employment. But if the handicapped were able to work from their homes, via computers, it might be possible for them to overcome this severe disadvantage.

Another respondent claimed that the computer could act as a deterrent to nuclear war. He felt that computers make it possible to monitor the status of the world's nuclear arsenal, which he felt is beneficial to all parties involved.

One respondent hoped that the computer would be beneficial in the campaign for equality of the sexes. In the future, as traditional barriers are broken down, he felt that women might be considered on par with men, for they would possess at least the same qualifications as the men.

THEME # 18: MANUALS ARE DIFFICULT TO UNDERSTAND

"Most early manuals, from one spectrum to the other, are poorly written."

Three respondents discussed the quality of manuals that accompany the hardware and programs. One claimed that many manuals are nebulous in their meaning, take too many hours to try to figure them out, and that they are notoriously poor.

Another respondent agreed that the writers had no idea about how beginners or experienced users learn. He felt that trying to learn with a manual was a very difficult task. One respondent stated that he found several glaring errors in the manuals that accompanied his equipment; this would really frustrate a beginner, who would be doing exactly what the manual said, and still have difficulties.

Finally, one user stated that he began to appreciate what was involved in writing a manual when he designed his help program for beginners. He thinks that too many programs are created on a whim. Today, many of the manuals are getting better, for people are not going to put up with this anymore, especially after spending so much money on a unit.

An interesting facet to the discussion about manuals and learning is the level of awareness that the respondents who discussed this topic had about learning styles. According to Tough's findings (1979), awareness of learning styles and the inadequacies of learning materials and the need for continuous learning are unusual.

THE NON-USERS ISSUE AGENDA: SOME OTHER CONCERNS

The non-users spoke on several issues that did not emerge during discussions with the users; a brief survey of these will now be presented. One respondent felt that society in general was losing control to computers at all levels. Control is important for this respondent, and she stated that she was concerned about this development.

The topic of the Third World and computers was an issue for two non-users. The main concern here was that computers are symbols for wealth and power, a form of 'electronic elitism'. By setting up computer assembly factories in the Third World, the masses are being exploited due to the high profit margin that may be realized by employing cheap labour. Related to this issue is the lack of concern toward the environment that computer companies may have. High-tech pollution could be a real problem in the near future, yet one non-user stated that there appears to be little of this in the press. He added that pollution studies done by computer companies may get classified under the rubric of 'national security'.

One non-user felt that banks are moving heavily into computer-assisted tellers. He envisioned a day, not too far ahead, when banks will be advertising that they provide 'live' tellers, as opposed to machines, as a ploy to get people to use their services. The 'personal touch' may be deemed by advertisers to be a unique concept in the future.

As has been illustrated, the non-users often differed in their concerns about computer related issues. There does not appear to be any consensus on an agenda for discussing the effects of computers on our lives. This is due to the fact that a systematic critique has not been developed as of yet for public debate. However, journals devoted exclusively to this topic, such as the IEEE Spectrum, (June, 1984) and the Whole Earth Review (to be critiqued below), are making great progress towards this end.

Chapter VI

ANALYSIS: STAGE II

It now became necessary to reconstruct the pictures of reality that underlay what the interviewees had been telling me. This entailed discerning patterns in their perceptions, and then checking with them to test the accuracy of my reconstructions of their reality.

The Person Card Technique

This technique developed by Hibino and Nadler (1980) creates meaning and organization out of qualitative data. It seems best suited to attitude and opinion responses generated by interviews. These responses may not have quantifiable properties for statistical manipulation, and the Person Card Technique helps in organizing and analyzing the themes described above.

One begins by extracting the essence of the response and placing this on small pieces of paper. In the present study, gummed back labels were used, and were inscribed with the response essence with the kind help of the university's word processing center. In all, over 100 responses were obtained, which contained the 'heart' of the interviews.

After all these 'person cards' have been established, they are grouped into families. A family consists of all person cards that have a common factor. Many separate groupings of families are normally required. These are then labelled, and this becomes the higher order person card, deemed to be the 'papa person card'. This technique is repeated until two or three mutually exclusive categories exist with any number of subcategories in each.

This technique is well suited for any number of situations, and helps to organize data in ways that are brain-compatible for the researcher. How this affected the interview notes as a method of analysis will now be outlined.

When the Person Card Technique was employed in conjunction with the interview analysis, three main headings surfaced as the highest order: psychological problems, institutional issues, and family and personal relationships. Since the statements made by the respondents have already been set out above, a chart of the results of the person-card technique exercise will be presented in Figure # 3.

The way to read this chart is to start on the left of page #1, and follow the flow of the organizational chart to the right. By continuously reading the themes in this direction, it soon becomes evident that the last theme on page #4 of the chart brings the discussion back to page #1.

FIGURE # 3: THE PERSON-CARD TECHNIQUE

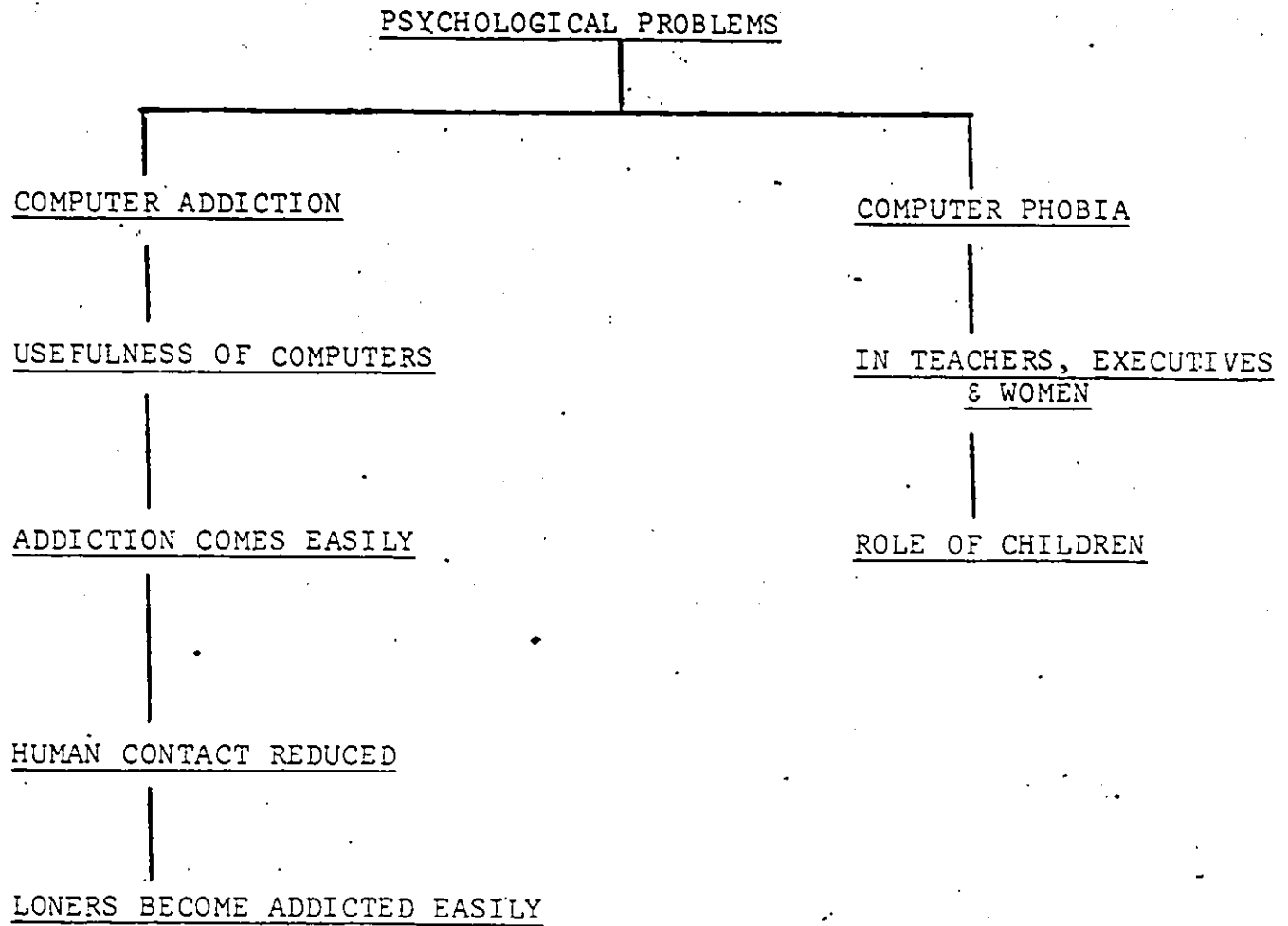


FIGURE # 3:

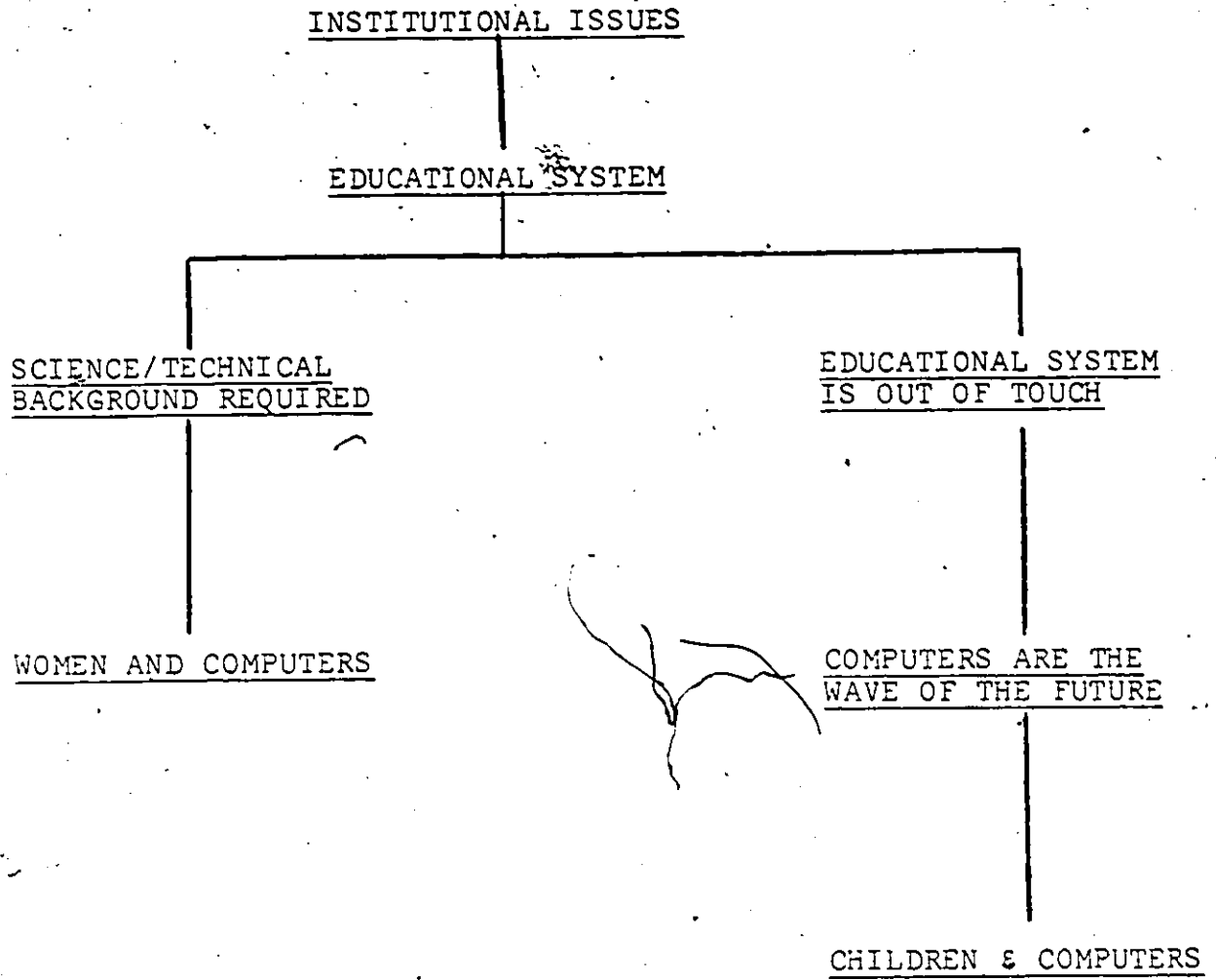


FIGURE # 3:

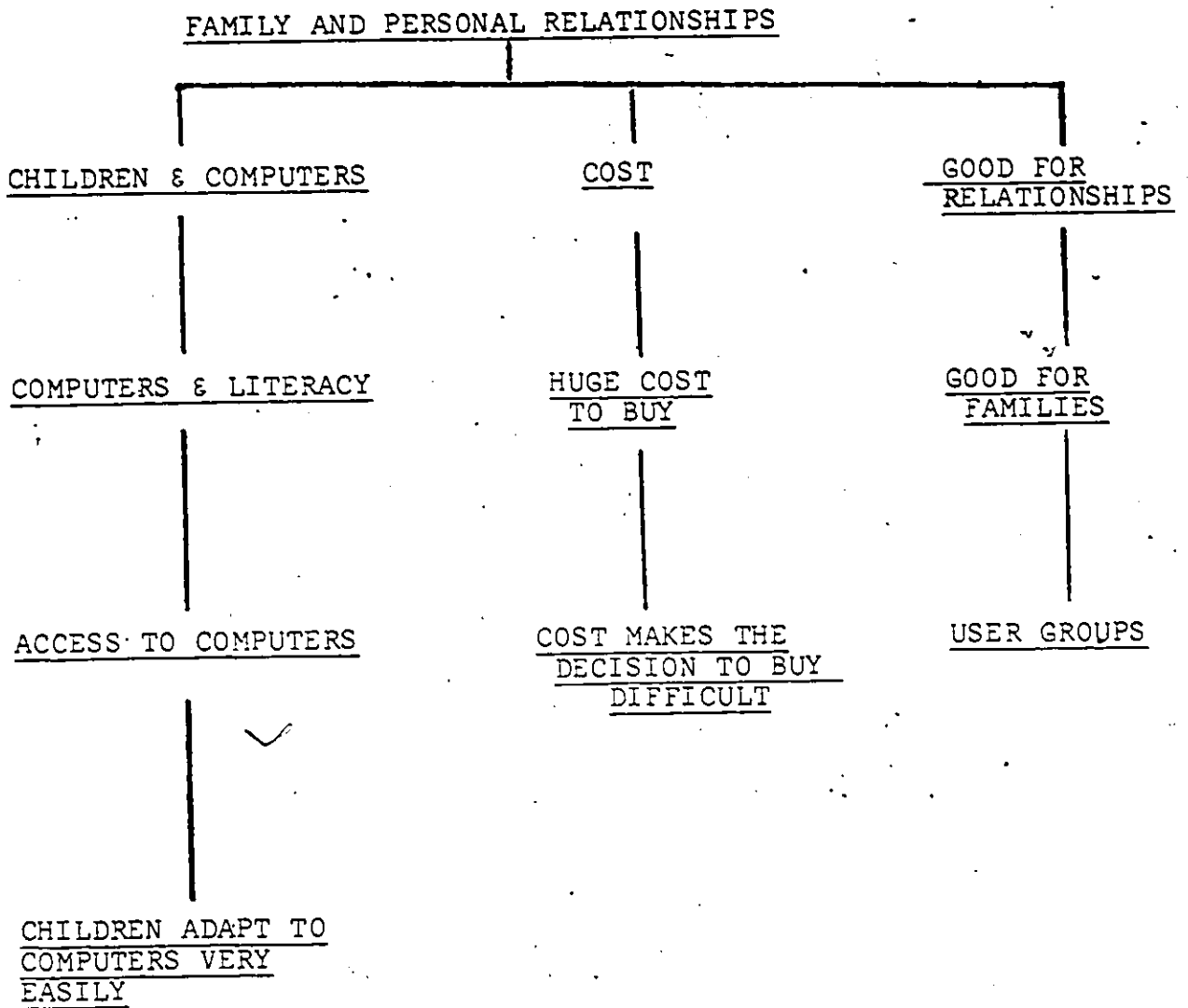
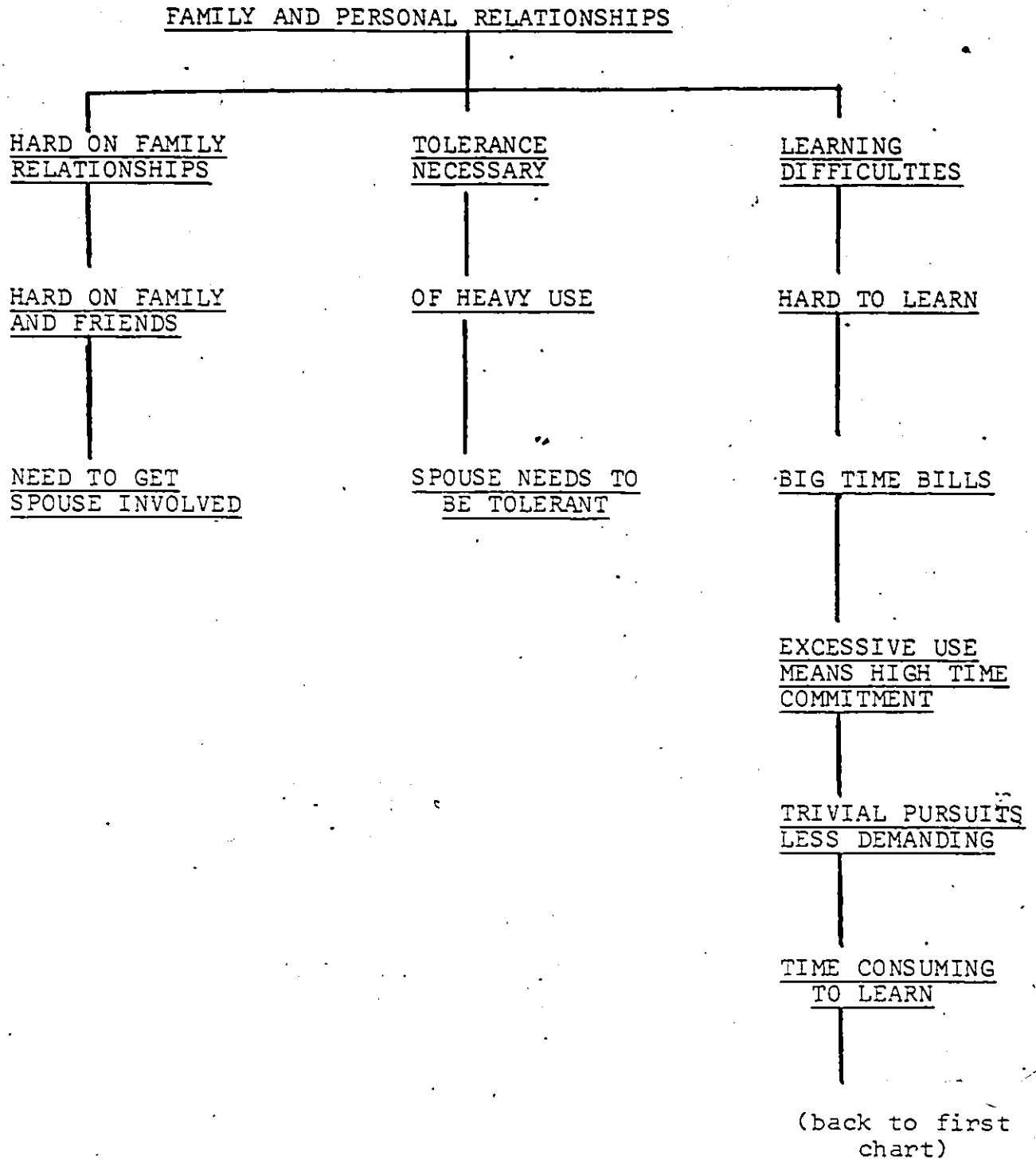


FIGURE # 3:



The Rank Order Survey

As stated in an earlier chapter, it was deemed to be necessary to triangulate the research by employing data and findings from other sources. Since self-reports are notoriously unreliable, by collecting and obtaining data from a variety of sources, using different methods and viewpoints, findings which keep turning up despite differing methodological biases command credibility.

Opinions are less reliable than interpretations, which are less reliable than observations. However, even the most carefully conducted scientific observations contain observation errors and are subject to the Uncertainty Principle. The reason for triangulation, a form of cross-validation, is to diminish errors of omission and false inclusion, and to lend support to the researcher's claim that these have been minimized within the power of the method.

One cross-check that was deemed to be an important aspect of the current study was to interview the wives of the users; interviewing the non-users was another. However, the current study decided to add an extra measure of credibility to this study: a rank order survey questionnaire to a users' group of PC enthusiasts. In this section, a brief overview of these findings will be presented, and will be compared to the interview findings.

Details on Persons Surveyed

At a meeting of the Apple Spice Users Group, (Dec. 12, 1984) the gathering was asked to participate in a rank order form survey and brief questionnaire. It was expected that this meeting would attract a fair representation of the group membership, due to the fact that the club was sponsoring a used equipment sale on this night. A total of ninety-four people participated in the survey (n=94).

The survey-questionnaire was two pages in length; participants were also supplied with a list, on gummed-back labels, of the 18 main theme statements that emerged from the interviews. Respondents were instructed to read the 18 themes, and pick what they felt, at this time, to be most important to them. These would be peeled off, and placed in the spaces provided on the survey sheet, in order of importance. An extra blank space was also provided for the participants to write in new categories that they felt to be important, but did not appear on the labels.

On page 2, a brief questionnaire qualified the participants as to their sex, age, amount of computer hardware owned, amount of diskettes owned, number of programs in use, and hours per week spent on the computer. This would provide a basis for determining the level of involvement that the participants had in the computer culture. (see appendix 'B') A brief examination of the findings will now be presented.

As expected, most of the respondents were men; women were a definite minority in the users group. Only 8.1% of the respondents were women, while a whopping 89.4% were men (the others administered the questionnaire). This would seem to confirm the postulate that women still are not a large part of the PC culture, at least in this group.

The age of the respondents was evenly distributed across the five categories in the questionnaire. If the categories are collapsed into only two groups, it is apparent that 41% of the group are under the age of 30, while 56.3% are over 30 years of age. It is interesting to note the high level of involvement of users from the older group.

Ownership of equipment provides a means of examining the level of involvement with computers by the participants. Over 90% of the respondents reported owning at least a microprocessor/keyboard; only 9.6% owned nothing. Half of the respondents owned two disk drive systems, 71.3% owned some type of printer, 23.4% owned a modem, 23.4% had a graphics system or a mouse, and 71.3% owned a joystick. Since all these peripherals cost a lot of money, it seems evident that the average member invested substantially in his system.

The number of programs that the respondents had in use was quite high. Over 42% of the respondents reported that they currently use more than 21 programs. The number of disks owned was also quite high, with 62.8% of the respondents claiming ownership of 40 or more diskettes.

The time that was spent on computer applications was evenly distributed across the five categories. Only 18.1% of the users would fall into the heavy use category of 20 plus hours per week. Half of the respondents used their machine between 1-10 hours per week. A summary of these results is presented in Table 1

TABLE 1

Users Group Survey Results

SEX	Male	89.4% (n=84)			
	Female	8.5% (n=8)			
AGE	1-20	21-30	31-40	41-50	51+
	22.3%	19.1%	28.7%	19.1%	8.5%
OWNERSHIP OF EQUIPMENT					
	Nothing yet	9%			
	Microprocessor	85%			
	Disk Drive	(0) 12.8%	(1) 34%	(2) 47%	
		(4) 1.1%			
	Printer	(0) 28.7%	(1) 71.3%		
	Modem	(0) 76.6%	(1) 23.4%		
	Mouse/Graphics	(0) 76.6%	(1) 23.4%		
	Joystick	(0) 28.7%	(1) 71.3%		
PROGRAMS IN USE					
	1-5	6-10	11-15		
	17%	23%	7.4%		
	16-20	21+			
	3.2%	42.6%			
DISKS OWNED					
	1-20	21-40	41-60	61+	
	18.1%	12.8%	24.5%	38.3%	
HRS PER WEEK					
	1-5	6-10	11-15		
	24.5%	28.7%	16.0%		
	16-20	20+			
	7.4%	18.1%			

Findings

The top six themes picked by the participants parallel some of the findings uncovered from the interview respondents. Out of the top six themes chosen overall by the survey group, three also appear in the top six of the interview group. It would appear that both the interview group and the survey group share many of the same concerns when it comes to the issue of computers in the home, found in Tables 2 and 3.

Before the two groups are compared (respondents and survey), it should be noted that the interviews were not about general computer issues; they were about personal computer issues. Theoretical issues are likely to diminish in the context of personal experience discussion.

Both groups agreed that computers are a useful tool, which is not surprising when one considers how much cash goes into a purchase. "The unit better be useful" for the users, and this was the highest rated theme for the survey group, while it was the second most important theme for the interview group.

The survey group picked the theme that "computers are the way of the future" as the second category of importance, while the interview group thought this was only the eleventh most important category of discussion. It seems as if the survey group has a very positive image of the PC when associated with the future, which may coincide with one respon-

TABLE 2

TOP SIX THEMES ACCORDING TO RANK ORDER

THEME	MEAN SCORE
Computer is useful tool	3.319
Computer is way of future	3.011
Children and Literacy	2.532
Computers will benefit society	1.585
Micro's and the Education System	1.521
Computers take up lots of time	1.479

TABLE 3

TOP SIX THEME SCORES ON MATRIX: INTERVIEWS

THEME	SCORE
On Excessive Use	54
Computer is Useful Tool	52
Computers Take Up Lots of Time	42
Computers Cost Lots of Money	41
Many People are Scared of P.C.'s	35
Children and Literacy	33

(based on model in Miles and Huberman; 1984: 167-176)

dent's feeling that by being involved in the computer culture, that this automatically makes one look "high tech", implying forward looking thinking.

The survey group felt that "computer literacy is important to a child's future" was the third most important category. Since the age of the survey group was quite high, it was expected that they would be interested in children and computers. This seems to be a motherhood -type issue, and is under attack by some researchers today (as will be demonstrated in Chapter 5 below).

Interestingly, the survey respondents felt that "computers are beneficial to society" was the fourth most popular theme. The interview group felt that this was only the seventeenth theme in importance. It should be noted that the survey group seems to have a more positive attitude about computers in general, while the interview respondents were able to verbalize many negative connotations, perhaps because the unstructured interviews acted as 'sounding board', allowing them greater opportunities to discuss their concerns than did this simple survey.

The survey group also thought that microcomputers were important for the education system, and that the schools would play a valuable role in the education of the children; this was the fifth theme for them. The interview group only felt that this theme was the tenth most important issue; nonetheless, they were able to verbalize many concerns regard-

ing computers and education, demonstrating that this is a high priority issue for them.

The survey group agreed that computer use takes a lot of time, ranking this as sixth in importance. The interview group rated this theme third, which seems to confirm that both groups have had to spend a lot of time to become computer proficient, due to the complex language of the computer operating systems. Two other categories were in the top ten for both groups under investigation. The survey group felt that computers were an expensive purchase, ranking this theme as eighth in importance; the interview group discussed this theme as the fourth most important. The fear of computers was the tenth theme for the survey group, while the interviewees rated this fifth. This seems to support the fact that there is a lot of fear on the part of many users and non-users.

NOTES FROM THE REFLEXIVITY JOURNAL

Collaborative researchers face the problem of reflexivity: or the need to record the changes that occur as a result of new or unexpected findings. The reflexivity journal, based on Progoiff's Intensive Journal (Progoiff:1975), and described in an earlier chapter, allows the researcher to reflect on the growing data that emerge from the interviews. This acts as a method of comparison to the propositional inventory, to trace the growth of awareness of salient new issues vis a vis the computers in the home.

The reflexivity journal enabled the researcher to divide his views on the computer culture into three distinct phases:

1. Non-users were avoiders, the so-called 'computer Luddites'
2. Users were mostly intelligent 'nerds', who spent all their time at the machine
3. The development of respect for the users' repertoire of skills

By treating respondents as collaborators (as opposed to subjects), I was able to develop a sense of respect for the users. This was in direct opposition to the media-based image of the PC user that affected my perceptions of this group.

Generally speaking, when reflecting on the interviews with the users, it seemed to me that they were often hiding something from me. Perhaps because I was not a part of the computer culture, there is not that sense of fraternity. Also, it may be due to the fact that many of the users don't often get the opportunity to verbalize about the socialization of the computer into the home, since the major discourse themes for them would be concerning hard and soft applications.

The Users

The users possessed a vocabulary that is unique to the computer culture. They would often digress onto tangents about this application or that program, and for a non-user such as myself, it was interesting to note the level of excitement that would accompany such conversations.

After three interviews with the users, I began to appreciate why these units are called 'personal' computers. The users really seemed to be attached to their PC's, and spoke of them as if they were more than just mechanical; it was almost as if the machines had a life of their own. I was beginning to get a real sense of how one could anthropomorphize the machine, especially with some of the more creative interactive programs available. Statements such as the need to 'master' the machine, the difficulties in achieving end goals, yet the striking language expressed when one 'got over the hump' and was able to 'understand' the machine, seemed to support this view. By the fourth user interview, it was very apparent that the machine was playing a very important function in these people's lives.

The fourth user interview really created a sense of what it was like to become completely attached to the machine. For this respondent, the PC had been the center of his life for the past eighteen months. For him, there was no doubt that the machine had profoundly changed his life. He was the perfect case study in computer overuse, yet surprising-

ly, he had been able to keep his family together, something that I was not really expecting. He had managed to reach an understanding of the role of the computer in his life, and his spouse had come to see it as a means for him to self-actualize and gain self-esteem.

He had to come to grips with the feeling of wanting to be on the machine all the time. This was mentioned by other users, as well, but for him, the desire bordered on the obsessive. The computer seemed to be providing a basis for his emotional needs, receiving gratification, satisfaction, and once again, the need to 'master' the machine. This could be demonstrated by the following striking language:

"Eventually, a certain competency level is established, where all things to do with the computer requires less time to master; until I reached that level, I was extremely uptight about learning the system."

I came away from the fourth interview with some valuable new insights that had not been pondered by me heretofore. The PC could in fact be used as a means of elevating one's self-esteem. There seemed to be an enormous sense of satisfaction to be derived from becoming a proficient user. I began to wonder if the effects of PC use on serious users, such as one who bordered on the fanatical like the fourth respondent, were actually all negative. If the machine could supply nourishment for one's emotional system, by boosting one's self-esteem and/or creating a sense of self-actualization, perhaps the serious user was reaching the highest lev-

els of Maslow's hierarchy of needs (Maslow; 1973). For example, this respondent mentioned that when he finally was able to develop a 'help' program for beginners and to teach an introductory course on computer applications, this had really made him feel vital to society (something sadly lacking in his job as a truck driver.) And, more importantly, it seemed to me that this was not an issue that was being dealt with in the literature, but seemed to be a given for the users.

The sixth interview was probably the one that really helped to bring together many of the issues that had been discussed by the users. This respondent had a keen sense of awareness of the computer culture and the problems inherent in PC use. A catalyst in the computer culture in this city, he founded the Apple Spice User's Group. He is expert at uncovering what makes a computer program work, and understands learning styles vis a vis computers.

One of the main concepts we discussed was the role of women and PC's. While this may seem to be a trivial topic to many, I feel that this issue is going to emerge very strongly in the near future. As noted, many women seem to have a built-in fear of computers. Many respondents stated that their wives wouldn't even touch the unit; this was supported during the interviews with the wives. It was at this point that I knew that the conversations with the wives would be a valuable asset to the study. And yet, in all the literature

that had been examined, little had been written about the role of women in the computer culture.

The disillusionment that many users faced after they had purchased their machines was in direct contrast to the eager user respondents. It was becoming increasingly evident that the educational system was not responding to the challenge of computer proficiency for beginners. New owners seemed to be confused about to whom to turn to, and often gave up in frustration. Initially, the design of this study was to incorporate these 'drop-outs' into the research. It soon became evident that this would not be possible, for, as I discovered, trying to get the disillusioned to speak about their experiences would be analogous to trying to find out why someone would buy a Cadillac if s/he didn't know how to drive. In other words, they were too embarrassed to discuss their experiences.

As our conversation continued, (the sixth respondent described how the PC could easily become the centre for the user's emotional needs. He added that addiction comes easily to a certain type of personality. Computers are still at the stage of requiring a highly technical background, which seems to exclude much of the public. However, with the advent of such 'user-friendly' systems as the Macintosh computer, the promise of an expanded market for personal computers seems about to become a reality.

After concluding my discussion with the users, I came away with a sense that there was much going on in this culture of which I had not been aware. The stereotypical image of the "computer nerd" hunched over the PC was replaced by an image of the average guy next door, who probably bought the unit as a curiosity, and then ended up getting more and more involved with its use. The nature of microelectronic technology is such that changes are constantly taking place, and there is always a new and exciting application, something else to master.

Getting the Spouses Involved

Getting the spouses of the users to participate in the study proved to be an excellent means for cross-checking the user's discourse. The level of tolerance that the spouses demonstrated when confronted by their mate's use of the machine was, to me, quite amazing (compared to the concept of the 'computer widows' described earlier). None of the spouses that were interviewed used the machine for their own applications, but one did help her husband to get set up initially. The other two were simply too intimidated by the machine to attempt to learn how to use it. However, one spouse added that she didn't use it because she didn't want to feel inferior to her husband.

It seemed as if the wives had all been able to reach a level of understanding about their spouse's PC use. One im-

portant concept expressed by them was the need to allow their husbands to have a channel for their energies, especially with creative tasks. Since the PC allowed their husbands to self-actualize, and even, to gain in self-esteem, due to the knowledge about something as trendy as the PC, they all felt that, overall, the PC was a positive influence on their lives. This was indeed a surprising finding.

The Non-Users

The non-users served as the control group, to get opinions on this debate from people who had the same SES as the users. It was expected that their level of interest in PC's might not be too high, mainly due to the cost of a machine. While cost did turn out to be major concern for them, a larger concern was of the rapid changes that are occurring in the marketplace. Discontinued product lines, obsolescence and state-of-the-art changes created a sense of confusion, which I felt was an interesting insight.

Surprisingly, many of the non-users had some background in computer applications. One respondent, a teacher, had taken the TVOntario course in computer literacy, a second had training in programming from St-Clair College, a third had expertise in maintenance of giant mainframes, and a fourth had used PC's at work for budgeting. Despite this contact and knowledge, they still hadn't found it necessary to purchase a machine, and it really didn't seem like a priority for them (except perhaps for their children).

Probably one of the most interesting developments for me upon reflecting on the non-users' interviews was the richness and variety of topics that emerged when discussing the role of PC's in the home. All of these respondents seem to have a sense that the personal and mainframe computers are going to have a profound impact on society for the rest of the century. They were concerned about what role that the PC was going to play in everyone's lives in the future. I feel that it is safe to suggest that the personal computer, and computers in general, have already had a major impact on our society, and this is why so many people seem so interested in participating in collaborative research, for they are able verbalize their beliefs.

It was expected that the non-users would not have any sense of what problems could be faced by incorporating a PC into the home. This was generally the case, as most of the non-users seemed to have a naive view of how their spouses would react (compared to the users' real experiences). For example, they felt that their spouses would be very tolerant of their PC use, and didn't really visualize some of the problems that the users had discussed. Only one non-user was able to fully verbalize perceived problems in a manner that was similar to those who had had to deal with the situation.

Another interesting observation was that the non-users sensed that the PC would not be a tool for trivial applica-

tions, such as home budgeting (often touted in commercials in the mass media). While they weren't sure exactly what they would use the system for, most suggested that word processing, game playing and graphic design would be interesting applications. Since they were not a part of the computer culture, however, it was not expected that they would be aware of the myriad possibilities that the personal computer offers the user.

In summary, then, the non-users offered the study some new insights to ponder, such as Third World issues, and threat of democracy due to the continued research into computer surveillance by governments. They all seemed very interested in the present study, and, while they may not have had any real world experiences to use as frames of reference, they nonetheless were able to add to the scope of the debate.

Chapter VII

IMPLICATIONS OF FINDINGS

SHIFT OF POSITION FROM THE PROPOSITIONAL INVENTORY

By now, it must seem apparent that many of the concepts alluded to in the propositional inventory at the beginning of the study have to be altered. Concepts that the researcher thought would be uncovered were often not as concrete as posited; these now have to be re-assessed. Briefly, then, this section will review the propositional inventory, and show how the new findings allowed the researcher to develop and grow in awareness of the effects of introducing computers into the home environment. Also, any new literature that was uncovered during the course of the research will be introduced at this time.

The Electronic Cottage

In the propositional inventory, there was some discussion about the concept of the "electronic cottage". Surprisingly, few of the respondents discussed this concept. The phenomenon was really only mentioned by two of the respondents, one of whom stated that it would be difficult to make any money from the PC in the home; the second argued that working from the home would be very beneficial to the elderly

and the handicapped, as noted. However, as has already been illustrated two of the respondents have been able to do outside consulting and teaching from their home, as noted above.

The Ten Propositions Revisited

In the propositional inventory, there were ten main propositions put forth. These will now be re-examined in light of new findings from both the the interviews and new literature.

Proposition #1: People who began to use computers in the past two years may be considered as innovators, and would be from the middle to upper class strata, due to the high cost of purchasing a microprocessor and related peripherals

At the outset of the study, it was felt that the users would all be considered as innovators, since the computer is still in the early stages of its incorporation into society (Blake & Haroldsen; 1975:127). They would also have to have the cash to pay for the expensive hardware and programs, due to the high cost of the purchase. This seems to be the case, at least according to this group.

The users were all very computer proficient, and had attained a very high level of awareness about PC applications. They had formed their own culture, replete with a user group membership, read lots of magazines devoted to applications, and spoke a language unique to the culture.

However, it should be noted that changes are taking place within the community of PC users. There appears to be a proliferation of cultures within this culture, and PC users seem to be splitting into several different and distinct sub-groups. These would include at least the following: the "hackers", hard-core computer users (Turkle;1984:196-237); the young urban professional (yuppies) (Adler:1984), who are attempting to climb the social ladder and, as one respondent stated, "to be high-tech", using their knowledge of the PC for prestige; the task-oriented user, who approaches PC use with one or two tasks in mind; and many layers in between. Add to this list the new group of non-technically oriented user, who may easily embrace the Macintosh PC and its clones. Turkle has defined this phenomenon as a "multiplicity of styles" (1984:165-195).

Therefore, it seems as if the proposition has been supported, at least for the group under investigation. However, with the passage of time, it may be true that the computer culture will become less technically oriented, and more user-oriented.

Proposition #2: Children are the main reason why families buy computers, as they try to keep up to the race for proficiency

Indeed, the respondents felt that the children would need to have computer skills in the near future, so it would advantageous for them to have a system in the home, as we have already seen. The children were often mentioned as being a

reason for the purchase, and non-users felt that if it became apparent that their children were disadvantaged due to the lack of a PC in the home, then they would have to consider the purchase more carefully.

The interesting issue that never really surfaced during the interviews about the role of children and PC's is the question of whether or not children need computer skills. This debate seems to be growing in force, and the anti-computer school is gaining in popularity, witnessed by new literature uncovered during the course of this research (cf. Giaguinta:1984; Mander;1985:14-15; Menosky;1984:40-46; Turkle;1984:29-137).

Proposition #3: People believe that computers will benefit them in their personal lives- i.e.- keep track of finances, sort recipes, act as word processor, develop home business skills, etc.

Both groups felt that the PC was or would be a useful tool for the home. In fact, it is surprising to note that non-users had clear concepts about the utility of these machines, and these were considered to be non-trivial by the researcher. The users praised the PC for the variety of tasks that could be performed with a PC, of course.⁵ However, as will soon be argued, most applications that the users described as being popular can be considered as 'external'. It is what this research defines as the 'internal' applications that seem to hold many of the promises of the

⁵ (see Stewart Brand [1984] for a complete account of what PC's are good for)

utility of the personal computer (see 'New Literature: What Wasn't Discussed' below).

Proposition #4: Computers are creating a "techno-centred" society, which posits that a person begins to identify so closely with the machine that it supplies nourishment for his/her emotions

The concept of a techno-centered society was first uncovered while reading the Brod text (1984). There was some evidence that this was in fact occurring among several of the users. It is very difficult to gauge the level of attachment that the users have for their PC's. It does seem safe to suggest that the PC has at least become anthropomorphized by the users (Frude;1983:67-157). The real test, of course, would be to take the PC's away from the users for a month, and study how they react to being cut off from PC use. One respondent noted that he had been able to stay away from his machine for a whole week once (two years ago!). As stated, there appears to be a growing sense in the literature of this phenomenon, especially in the field of psychology

(Goleman:1983;Brod:1984;Turkle:1984;Walsh:1985;Winner:1985).

Could we be on the threshold of a new inter-disciplinary field, perhaps called psycho-computology?

Proposition #5: To adapt to PC's, one has to plod through the manuals- a cumbersome task requiring infinite amounts of patience and perseverance

There was little discussion about manuals, much less than was expected. As has been illustrated, only three of the respondents discussed this topic at all, and this theme

ranked last on the scale of level and depth of dialogue on the matrix. Perhaps it is due to the fact that manuals are getting better, as one of the respondents stated. Or, as another participant suggested, perhaps the users have a perverse attraction to difficult manuals and applications (in the Brand text, this is described as mithridatism: habituation leads to tolerance, and then a taste for reading them). Also, after 2 or 3 applications, the others become easier to acquire. Besides, new computer technologies, such as the mouse and the Macintosh PC, have replaced much of the need to be a technically oriented computerphile (Frude;1983:67-102), although the current users all owned Apple II machines. trend is fragmenting the computer culture into sub-groups, as illustrated above.

One should not overlook the role of the user group in the learning process, however. Resource people like the respondent who designed a 'help' program for beginners, and devotes much of his time to teaching new users the intricacies of the system, must be seen as resource centers that beginners can turn to. This would mean that manuals would have a lesser role for users in general. If they needed any advice on a program, there would always be the user group to turn to. And, as one respondent stated: "When all else fails, read the manual".

Proposition #6: Families that are able adjust to computers are able to work as a group to solve PC problems, or have at least one bright member that can explain to others about new discoveries and insights

There was only one example of this phenomenon amongst the respondents. There simply does not seem to be much in the way of group problem solving in the home. What is the more common experience is that one member of the family uses the system the most, and is able to solve anyone else's problems in the family.

Some family members resisted any contact with the PC, especially the wives. A pattern that seems to reoccur is that certain family members have no interest in PC's whatsoever, while others embrace the machine right away.

Proposition #7: People who are able to adapt find it to be a very marvellous tool for the whole family to use, perhaps due to the fact that they are already bonded as a unit

This proposition tends to overlap with the above one. There were signs that the PC could act as a bonding agent for certain members of the family, especially between the parent and the child. Respondents described how they enjoyed interacting with their children at the terminal. For the very young, the concept of the mouse allowed the children to interact with the machine without having to know how to read. The parents described this as being rewarding both for the child and for them.

However, this is a very interesting area for researchers to examine. It seems as if the PC has the ability to allow for sharing between parent and child. One participant stated that he knew of a case where a father and a son shared in the PC learning experience as a team; this was the first

time that they had done a task together in over three years, and the father found it to be a very rewarding experience.

The negative aspect of computer use is the breakdown of communication between husband and wife. The introduction of a PC into the home may exacerbate already weak relationships.

Proposition #8: The head of the household rationalizes the purchase of a computer as a way to do work-at-home, while getting the children involved

Interestingly, not one of the users bought their computer with the idea of using the machine to work at home and make money (except of course the computer salesman, who got into the sales business out of his interest in computing rather than in sales). For this proposition it may be seen how the literature may impose expectations on a study at its outset, and yet, have little to do with the reality of the situation. As mentioned earlier, the concept of the electronic cottage turned out to be a non-issue for this group of PC users. They bought the machine as a hobby or for their children's future, the two comments most often mentioned.

Proposition #9: Non-users are waiting for the price of computers to come down, and for the user-friendliness of programs to go up.

Indeed, many of the non-users complained about the high price of purchasing a PC. They expressed an interest in ownership, but cost seemed to be a major hurdle for this group. The level of awareness and involvement of non-users of the PC culture was interesting. Four out of the six non-users

interviewed had had some experience with computer applications. However, there was some discussion about the difficulties in learning how to operate a PC and its various programs. The ability to be able to learn what one would need to know to become computer proficient seemed, for the non-users, to be a difficult task.

Also, the continued phasing out of computer lines by manufacturers worried the users. Now that IBM, whose name has become synonymous with stability, has decided to discontinue the PC Jr., buyer dissonance will continue to be quite high.

Proposition #10: Computers are very difficult to learn and require huge amounts of time to become proficient at them.

The users had plenty to say about the time needed to become adept at using a PC, as stated. The group that the sample under investigation was one of innovators, as we have seen; these could also be described as "technical hobbyists" (Turkle;1984:184).

These users seem to take pride in being able to spend hours at the terminal trying to learn the intricacies of the system and programs. For them, the computer becomes a way "...to learn the peculiarities of a purely logical universe, one defined entirely by rules." (Turkle;1984:190).

Although the computers available and the population buying them has changed, there still seems to be the impulse to "...find a way to a sense of intimate understanding of the logic of the machine." (Turkle;1984:187) Therefore, a trend

develops wherein the user is drawn to spend more and more time at the PC terminal.

However, with the advent of 'approachable' computer systems, such as the Macintosh, what may be occurring is the fragmentation of the PC culture. Non-technical people are now able to get involved, which should really open up the home market in the near future.

What Wasn't Discussed

"All panaceas become poison."

NEW BIBLIOGRAPHY

During the course of this research, it was inevitable that many new sources of relevant literature would be uncovered. Since the focus of this study is so topical, some of the new literature that is being written is based on empirical findings, which may offer a basis for comparative research (Brod:1984; Turkle:1984; Giaguinta:1984). Other articles seem to be expressing intuitive points-of-view that didn't receive much attention during the interviews, but may be important issues nonetheless.

It should be noted that the interviewees focused upon the introduction of PC's into the home, and did not really discuss larger societal issues; the non-users did bring these up occasionally, however. It may be that the respondents have many opinions about these themes but simply didn't deem them to be relevant to the research topic.

The discussion on what the computer is useful for was quite intensive for both groups. A recent publication called The Whole Earth Software Catalogue (Brand:1984) may be seen as an important document for users and non-users alike. This book provides an overview and evaluation of many PC systems, including hardware and software. States the text:

"For new computer users these days, the most daunting task is not learning how to use the machine, but shopping..." (1984:2)

For beginners and sophisticated computerphiles, the WESC is essential reading, for the evaluations and recommendations are superb (it cost \$1.3 million to produce).

Internal Applications

If we use the WESC (Brand:1984) as a basis for what the PC is useful for, it becomes apparent that several categories of PC applications were not mentioned by either group. Most of the applications that the users discussed seem to fall into the category of what could be deemed as 'external' applications. Of the 12 categories in the WESC, there was repeated reference, by the users, to the following applications: word processing, spreadsheet analysis, data base management, telecommunications, programming and game playing. However, the PC offers its greatest potential in what is deemed to be 'internal' applications. These would be geared towards more creative applications, and would require the user to draw on the right side of the train (Ed-

wards; 1979:25-44). Of WESC's 12 categories, these represent at least the following (unmentioned by the collaborators): idea processors, such as 'Think Tank', meditation programs, computer graphics and drawing, Super Pilot, a creative language, Logo, designed for children, and programs that allow musicians to write music. Most of these internal applications are being promoted by the Apple Macintosh.

Programs for Women

About the only applications that would be considered internal that were discussed by the users were computer graphics and Super Pilot; these two are only at the frontier of what will be possible in a few years. Therefore, it seems evident that the users, whom we consider to be 'technical hobbyists', seem to prefer external applications. It could also be posited that as more women become a part of the computer culture, we will witness the rise in popularity of internal applications.

There is one applications program that has been widely accepted by female users: Broderbund's PRINTSHOP and its add-on LIBRARY disks. This program essentially provides the user with a printshop (printing banners, posters and a variety of cards). Women like it because:

1. It has high, immediate utility.
2. It serves interpersonal ends (you can send cards to friends, for instance)- it has a very human touch.

3. It is very easy to learn. The male addiction to mastering difficult ('mucho macho') programs is regarded by most women users as a vainglorious affectation.

There is every indication that the new generation of computer users (see below) shares this concern about the lack of useful software for women.

Invasion of Privacy

When examining some of the new literature on PC's in the home, there seems to be a growing debate on computers and privacy. The computer has the ability to keep massive files on most everything that citizens in our society do in their day-to-day lives. This issue seems to be one of the darkest sides of the computer age, yet only one respondent discussed this theme at all. The users do not seem to be concerned with this topic in any way whatsoever, and the non-users may not have had the opportunity to really understand the implications of computer surveillance, and the possibilities that computers might be used to invade our privacy. (cf. Wicklein:1981; Burnham:1983; Hunter:1985:32-37).

The heavy users are aware that PC-using 'pirates' are stealing from some big computer companies, and that PC 'hackers' are accessing data bases of major corporations and even the government. So, they feel that the private individual need not be without resources when confronting large corporate computer systems.

Some writers have suggested that PC users are living in a world that is oblivious to what is going on around them -that they use the computer as a shelter from everyday realities (Turkle;1984:196-238; Kleiner:1985: 6-9). What the present study uncovered was a group of users who were very concerned about the role of the PC in their lives. They were aware of many of the positive and negative effects of PC use. They wanted the education system to be better places for their children, and for the world to be a better place to live in. The non-users shared many of these concerns; it is interesting to note that while the non-users felt that PC skills were important for their children, they didn't think that these skills were a necessity for themselves.

Problems Concerning Health and Pollution

In the early days when people first started having contact with computers, there was quite a lot of concern about health issues. But not one respondent discussed the problems of sitting too close to a monitor, or problems such as eye strain and ergonomics. Other issues, such as chemical pollution caused by the manufacture of computer components, (Mander;1985:12-13), was discussed by only one respondent, a non-user. It will be interesting to examine how important these issues become in the future.

Structural Unemployment & the Emergence of Electronic Sweatshops

Unemployment caused by the computer replacing workers is another big issue in the literature. There seems to be more evidence of late that the computer is replacing more jobs than it is creating (Mander;1985:15-16). However, for all the respondents, the feeling was that by having PC skills, their children's chances for employment would be greatly increased. Not all researchers seem quite so optimistic, however (Menosky;1984:42-43).

A new concept that relates to the unemployment issue is the development of what has been described as "electronic sweatshops" (Calthorpe;1985:30-31). Instead of the utopian vision promoted by Toffler(1981) and Martin(1979), (and many others), what is really occurring in the workplace is a "back office" electronic sweatshop.

Imagine a single-story office building over eight acres in area, with desks 150 feet away from the nearest window. Fill it with computers, cathode ray tubes, and people making under \$20,000 per year, surround it with a parking lot for 8,000 cars, and put it all at a remote freeway interchange. Here you have the "back office", the hottest new item in commercial real estate. (Calthorpe;1985:30)

Once again, we see evidence of reality contradicting prophecy.

The Networked Society

Politics and the role of the PC is another popular issue for the computer prophets (Hiltz & Turoff;1981:197-201; Mander;1985:16-20; Winner;1985:24-26). The debate centres around the PC's ability to de-centralize government institutions by putting power back into the hands of grassroots organizations. Hence, we hear more talk about 'networking', (See: Appendix A). Whether or not the computer will live up to its potential is still open to debate, but not one respondent discussed this issue at all.

While the role of women in the computer culture received a lot of attention by the respondents, the concept of women, work and computers was not a topic of discussion. However, one networker (Howe;1985:21) described her experiences with working in the home. She felt that the concept of the electronic cottage was detrimental to women, who not only had to perform work duties at home, but also were expected to keep up to all the household chores, and more.

Alienation

Researchers have been debating the concept of alienation vis a vis computers in home, as we saw in the propositional inventory. This topic did receive marginal attention by the respondents, but there did not seem to be too much concern on their part. Will computer use lead to less human interaction? If the users of this research are any indication, it

seems as if, by owning a PC, the user could in fact increase human interaction, by becoming a part of a culture, and by developing new associations via the users' group. The heavy users were too involved in interacting with others- many of them also PC users- to take this matter too seriously.

The Information Have-Nots

While cost was often an important issue for both groups of respondents, the phenomenon described in the propositional inventory as the 'information have-nots' received little attention. Are PC's creating a new class of 'information elites'? If it is true that PC's and their applications are going to be important criterion for obtaining job placement in the not-too-distant future, then it is vital that policy-makers address this issue. The respondents were not aware of this phenomenon, except to suggest that it is a rich man's toy, unless great sacrifices were made in other areas of one's life.

Much has been said about the benefits that the elderly and the disabled stand to gain from PC's in the home, as stated in the propositional inventory. However, only one respondent had the vision to see these; if this is to become a reality, then there is a need to educate the general public as to the potential benefits. However, since the interviews focused only on the 'personal' experiences of the respondents, it could be that a reason why this topic received

little attention by them was the fact that it is out of their range of direct, personal experiences.

Computers as An Extension of the Self

An area that received much attention in two of the empirical studies on PC use (Brod;1984;Turkle;1984) and one literary analysis (Frude;1983) is the concept of the computer becoming an intimate friend. The rich language of the users suggests that this may in fact be the case. Even the term 'personal' computer implies that one may develop a close bond with the machine. While this thought may seem repulsive to many, one only has to look at such phenomena as "Cabbage-Patch Dolls" and "Pet Rocks" to see how our society animates artifacts.

The disturbing manner in which users approach Joseph Weizenbaum's ELIZA program may be cause for alarm. ELIZA was designed to simulate a session at the psychologists' office, and would respond to statements with standard prompts. However, users tend to perceive the program as being real, and would detail very personal and private problems to the machine (Frude;1983:83-90).

This area of research will surely grow in popularity amongst scholars in years to come, and especially for psychologists. And, when personal robots enter into our lives, the humanist-technologist debate may blossom into a full-fledged war.

In fact, the experience of this research suggest that the users are very attached to their machines. Marx's analogy of the machine as using people may seem to be antiquated, at least for PC users. Marx felt that the mechanical society imposed a rhythm on the worker that was not of their own choosing (Tucker; 1978:291). The PC is different, however; since it is a tool, it becomes an extension of the user. The PC as a tool compensates for the ravages of the machine at work (Turkle; 1984:170).

The 'personal' in personal computers is a very apt description; users develop relationships with their machines in very personal terms. As a tool, the PC extends the users capabilities. For example, electronics engineers were one of the first users of personal computers. This group has been noted as having a very high dissatisfaction with their work, as well (Turkle; 1984:170). The biggest complaint aired by electronic engineers is that the spontaneity of their work had been removed. Electronic engineers were drawn to their profession due to the "mythology of the shop" (Turkle; 1984:170). However, the reality of electronic engineering, especially in the area of computer programming, became one of assembly line production, a team approach described by Turkle as "...the proletarian programmers" (1984:170). The electronic engineers brought this factor with them when they first began to fool around with PC's.

Electronic engineers interviewed by Turkle described how they felt a

"...sense of power that came from having full knowledge of the system, of the feeling of 'control when I work in a safe environment of my own creation'" (1984:170).

Although electronic engineers work with computers for a living, what they do at home is not more of the same. They are able to create, to push their learning abilities to the limit, and to feel self-actualized:

"You do the whole thing- building up from machine code to finished project. It makes you feel in balance." (Turkle;1984:171)

Likewise, for the PC users interviewed for this research, 'personal' means that they own the machines, arrange its innards and doctor up its software. Personal implies that it is 'yours'; no one else can use it or access it, and everything you do to it is your (co)-creation. Turkle's study supports this notion, as does the current one.

Chapter VIII

ANALYSIS: STAGE III

Emergent Design: Impact on Research

As stated in an earlier chapter, emergent design was presumed to be operational throughout this research project. Insights gained from the respondents, the literature, and the peer de-briefers caused alterations to the initial research design. In new paradigm research, it is presumed that if one is exploring something that is not really understood at the outset, it is difficult to operate within a pre-determined framework of analysis (Carney;1983:24).

This position has been carefully demonstrated throughout the course of this study. After several interviews with the users, it was determined that it would be a sound proposition to introduce the wives of the users into the study, to gauge their perspective on what was occurring in their homes. This was possible only due to a flexible design.

Triangulation is often difficult to plan at the outset of a study. Initially, it seemed as if it would be difficult to locate a group of computer users who would be able to participate in a rank order survey questionnaire. However, once the interviews began, it was almost immediately apparent that a culture of computer users existed in this area,

with the users' group operating as the meeting place. Therefore, it seemed possible to employ the users' group as a whole in the study. Due to the flexibility of the design, research was applied rather than pure.

"(NPR) is an approach that goes with learning on the job, with self-directed learning, and self-directed evaluation." (Carney; 1983:34)

Responsive evaluation requires listening to the words of those whose constructions of reality you are attempting to map. When you are dealing with collaborators in your research, rather than research subjects, you have to be open to any new data that may emerge from your various sources. The study has been flexible, and it proved possible to modify or re-direct its interpretive schema as new findings emerged. This responsiveness has been operational throughout this study. This may be demonstrated by the manner in which the study followed up on bibliographical leads. These were incorporated into the researcher's frame of reference (i.e.- Brod's concept of technostress, Turkle's notion of the PC as 'the second self', and others). These new findings were not embarrassing to the researcher, and were in fact embraced as valid concepts to act as comparative tools for the purposes of this study.

The cross-check on the wives' perceptions of interaction patterns in the home after the advent of the PC also enabled new insights to be gathered. This enabled two points-of-view to be compared from the same household, and added to

the credibility of the findings. Adding the users' group survey allowed a larger group to participate in the study, as well. All these factors were welcome additions to the study, and added to the scope of the findings.

The phenomenon-recognition check was also an important concept in the emergent design, to be explained below. This review of the important concepts uncovered during the study, and reported on to the user-respondents, turned out to be a crucial component of the method; this was not apparent, however, until the end of the research.

Phenomenon Recognition Check

As another method of validating the research findings, the researcher returned to the user respondents near the end of the study. Collaborative research requires the investigator to provide collaborators with an opportunity to assess the truth, for them, of the researcher's interpretations of the 'deep sub-structure' of their views on the topic under investigation. This is done via a phenomenon recognition check: differing constructions of the collaborators 'reality' are set before them, so that they may comment on the extent to which any of these constructions agree with their own constructions of that reality.

Two reconstructions were put together for the recognition check. The first was the person-card technique outlined above, which flows much like an organizational chart (see

Figure # 3). The second was a chart constructed after reviewing the tape-recorded material, in terms of Brod's "techno-stress" hypothesis (which seemed highly pertinent to the data in the tapes : see Figure # 4).

These two reconstructions were put together by different people involved in the analysis, (the thesis chairman and the researcher) and involved differing approaches to reconstruction. The aim behind this procedure was to provide significantly different versions of the users "reality", thus sensitizing the collaborators to the researcher's influence in interpreting the results.

All the users participated in the exercise, as did their spouses (two of whom were not involved in the original interviews). Both of the charts were deemed to be highly effective as presentational devices; all the respondents became engrossed in the exercise, and participated at length, making extensive comments, which have been incorporated and are identified and commented on below. (see also: Figure # 5, for modifications)

FINDINGS

Mythinformation by the Mass Media

After six months of analysis, it was interesting to return to the users and see how their perceptions of the computer culture had grown in awareness. The sense that was derived is that the users of this study do not appear to fit

the picture presented in the mass media about heavy PC users. This is the depiction of heavy computer users as engrossed by their PC's to the detriment their marital (and other) relationships, to the extent that their wives become "computer widows".

This study dealt with married people, and all of the collaborators would be deemed as heavy users (over 20 hours per week on the machine). However, the image of the user who is interested exclusively only in applications does not seem to be borne out. Instead, what this study uncovered was individuals who care about many of the issues that are not really being dealt with by the media, such as the disability of women's not attaining PC skills, and to a lesser degree, the inequality of access to PC's by children in different levels of society.

The users all had managed to keep their relationships together, sometimes under trying circumstances. They were not avoiding the issue of loneliness experienced by their spouses and were dealing with these issues as best they could, such as by discussing the matter with their mates, or simply, by spending time with them. The spouses seemed to appreciate having their mates at home, for the sense of comfort that resulted from this.

Initially, there was something of a tendency, on the part of the mass media, to portray heavy PC users as extremely bright persons possessed by their machines. (Faflick;1982)

The heavy user was typically a loner, who obsessively spent many hours per day at the terminal. While such persons surely exist, what this study has uncovered are serious heavy users who are not much different from other members of our society. They are interested in practical applications of their PC's, such as paying taxes or helping their children to produce exceptional notes for school. Other practical applications include: getting a complicated thesis printed out; teaching others how to program or learn complex applications programs; developing applications programs of their own; and devising special programs to help children learn computer skills. For children, the Apple leads in learning applications for personal computer users (Brand;1984:176-177). The users really want to involve all the family members, and would like to see more programs that would serve a woman's needs, which would include practical applications. The popular program "Print Shop" is an example of a program that has taken advantage of the lack of software tailored towards women's interests.

Perhaps a reason for the negative image of the computer user by the mass media is due to their lack of awareness of what is occurring within the PC community. If they relied solely on the written material that has already been analyzed above, it should not be too surprising to realize that the members of the mass media are not doing their 'legwork': going out and talking to computer users.

When faced with many of the issues that were uncovered by this research, they were not upset or intimidated. They were able to relate to the negative aspects of PC use, but also stressed the positive features. Over and over, the users described how the users' group had become the forum for new friendships. The users' group seems to be a great equalizer, for all members are accepted, not for their SES, but for their computer- or program related knowledge. Members are prepared to help any other group member at any time, day or night, with problems that they may be having. After the formal meeting has finished, members usually form small groups to discuss application problems that they have encountered; many carry these small group meetings on in their homes on week-ends, as well.

The chart based on the "techno-stress" model provided the major focus for discussion among the collaborators, possibly because all the concepts were laid out on one page. They seriously and fully considered this 'downside' version, giving it prior attention, while holding that the other version (a more positive one) also represented their views- an ambivalence shown by their initial placing of three negative issues among their first four issues.

A concept on the chart that relates to the creation of "techno-stress" is the problem of strained relationships. Two of the respondents, with their spouses present, stated that the current study helped them to focus on the problems

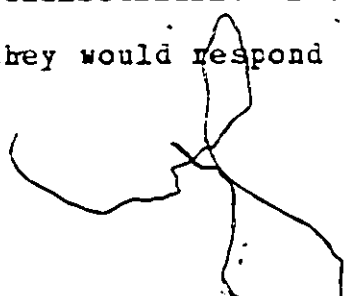
inherent with PC overuse, and seemed to be closer to their spouses than last fall when the interviews took place.

On getting the spouses involved, two of the wives stated that a reason why wives do not participate is because they have so many tasks to do when they are at home, especially if children are involved. They stated that there is simply not enough disposable time left over for them to learn anything on the PC, mainly because they are not in the mood to learn, and prefer to enjoy their 'quiet' time at other tasks.

One wife stated that she is using her husband's expertise to voluntarily help a severely handicapped youth to communicate and learn. In this way, she was able to get involved with computers in a way that she deemed to be useful, because she was helping someone with severe deficiencies. While this issue was brought up in the initial round of interviews (although not by this respondent), when this topic became a reality in their lives, they were able to better discuss the pros and cons of using PC's to help the severely handicapped to learn.

Apple Turnover: The Mac makes the Apple II Obsolete

The users were asked to comment on the Macintosh PC, which was on the outside of topics of discussion (see Figure #4). This was one of the 'undiscussable' issues; the topic was brought up to see how they would respond to the prospect



of their machines' being made obsolete (the same was true for the discussion on 'pirating', another 'undiscussable topic, more fully developed in the 'Conclusion'). While the unanimous conclusion was that the Mac was a wonderful development, (with some reservations about the mouse), these people were in no hurry to scrap their Apple II's and buy into the Mac. One user commented that the Mac will be coming down in price very soon. Another stated that the so-called 'Fat Mac' (512Kb vs 128Kb) was the only one to purchase. Only one user stated that he would be willing to abandon of the Apple II series if the forthcoming Atari Macintosh clone is as good as the advanced publicity promises.

One user stated that the user group as a means of new associations should be moved over to the area of computer elites. Since Apples and IBM's cost so much more than the Atari or the Commodore, these should be considered a rich man's domain. The consensus about the user group was that it was a great place to make exciting contacts, especially if one is an expert in certain applications. A host of people from high SES means that one who is in a lower category may be seen as superior in a given venue.

Three New Concerns Emerge

Three smaller concerns were expressed by various participants. One wire stated that computerphobia as it relates to the education system was changing, since the board had hired

a resource person to help teachers out with problems of implementing PC's in the classroom.

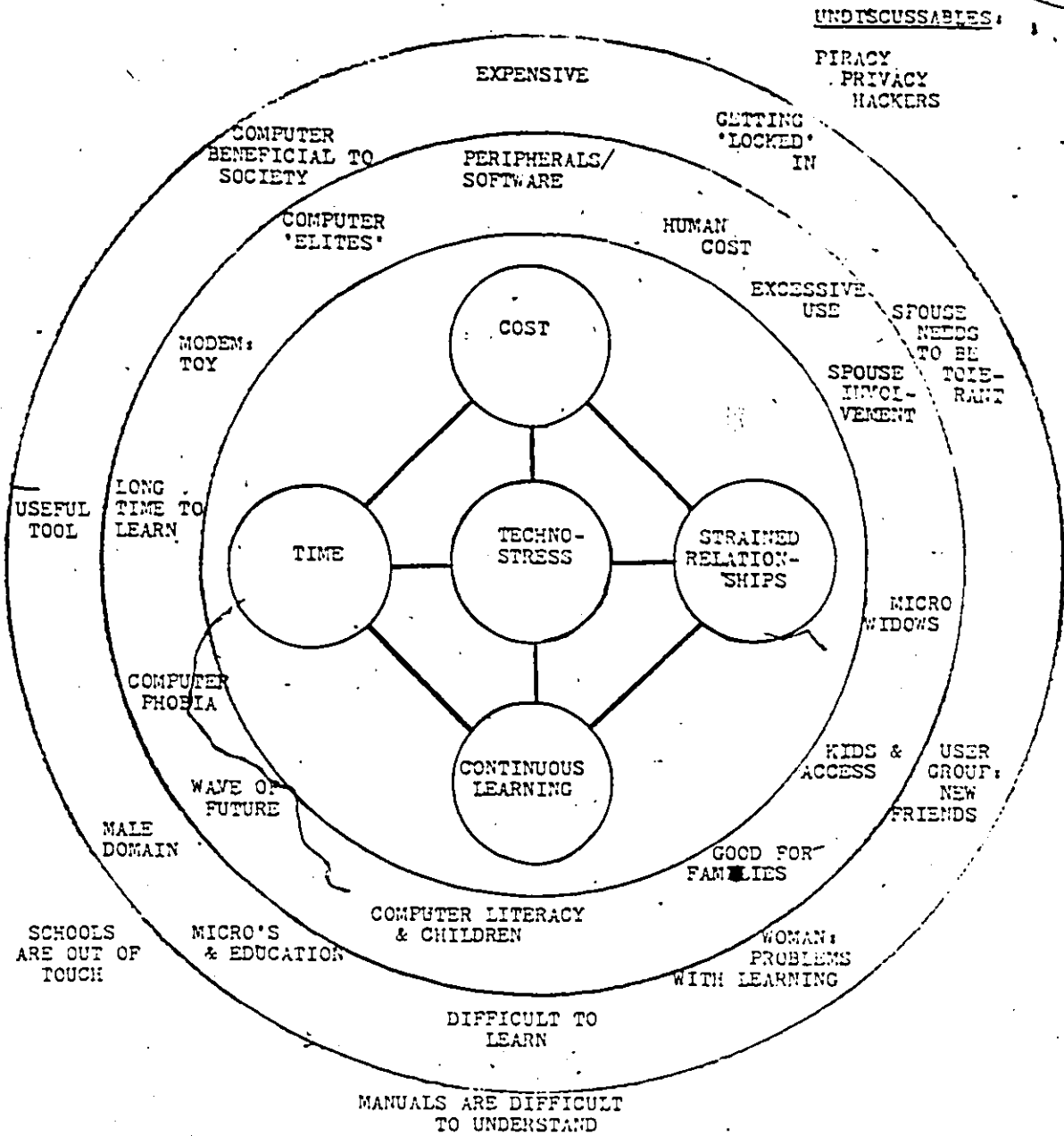
Another respondent stated that he felt that a new issue had emerged since we last met. Third World students were complaining about the problems of electrical systems in their homelands. While they would like to have a PC to take back home, they didn't trust the electrical systems, which could garble text and foul-up data. It is interesting to note the omnipresent tendency to think over the interviews and to be alerted to new views and issues.

Finally, one respondent stated that he felt that modems should not be deemed strictly as toys, although his wife disagreed with him. He did state that it was extremely difficult to become competent at using modems, especially with the Apple system, and that the problems inherent in 'downloading' or copying programs from a distant source plagued Apple users, in general.

Conclusion

The phenomenon recognition check provided the users with the opportunity to comment on the 'reality' according to the researcher. Several of the respondents stated that they were curious as to what the results of the study had been, and seemed to appreciate the opportunity to comment further on the research. By giving them the opportunity to do so, this exercise also gave the study an extra measure of credibility.

Figure #4: THE PHENOMENON-RECOGNITION CHECK



UNDISCUSSABLES:

PIRACY
PRIVACY
HACKERS

GETTING
'LOCKED'
IN

HUMAN
COST

EXCESSIVE
USE

SPOUSE
NEEDS
TO BE
TOLERANT

SPOUSE
INVOLVEMENT

MICRO
WIDOWS

KIDS &
ACCESS
USER
GROUP:
NEW
FRIENDS

GOOD FOR
FAMILIES

WOMAN:
PROBLEMS
WITH LEARNING

DIFFICULT TO
LEARN

MANUALS ARE DIFFICULT
TO UNDERSTAND

SCHOOLS
ARE OUT OF
TOUCH

MICRO'S
& EDUCATION

COMPUTER LITERACY
& CHILDREN

MALE
DOMAIN

WAVE OF
FUTURE

COMPUTER
PHOBIA

LONG
TIME TO
LEARN

MODERN:
TOY

COMPUTER
'ELITES'

COMPUTER
BENEFICIAL TO
SOCIETY

EXPENSIVE

PERIPHERALS/
SOFTWARE

COST

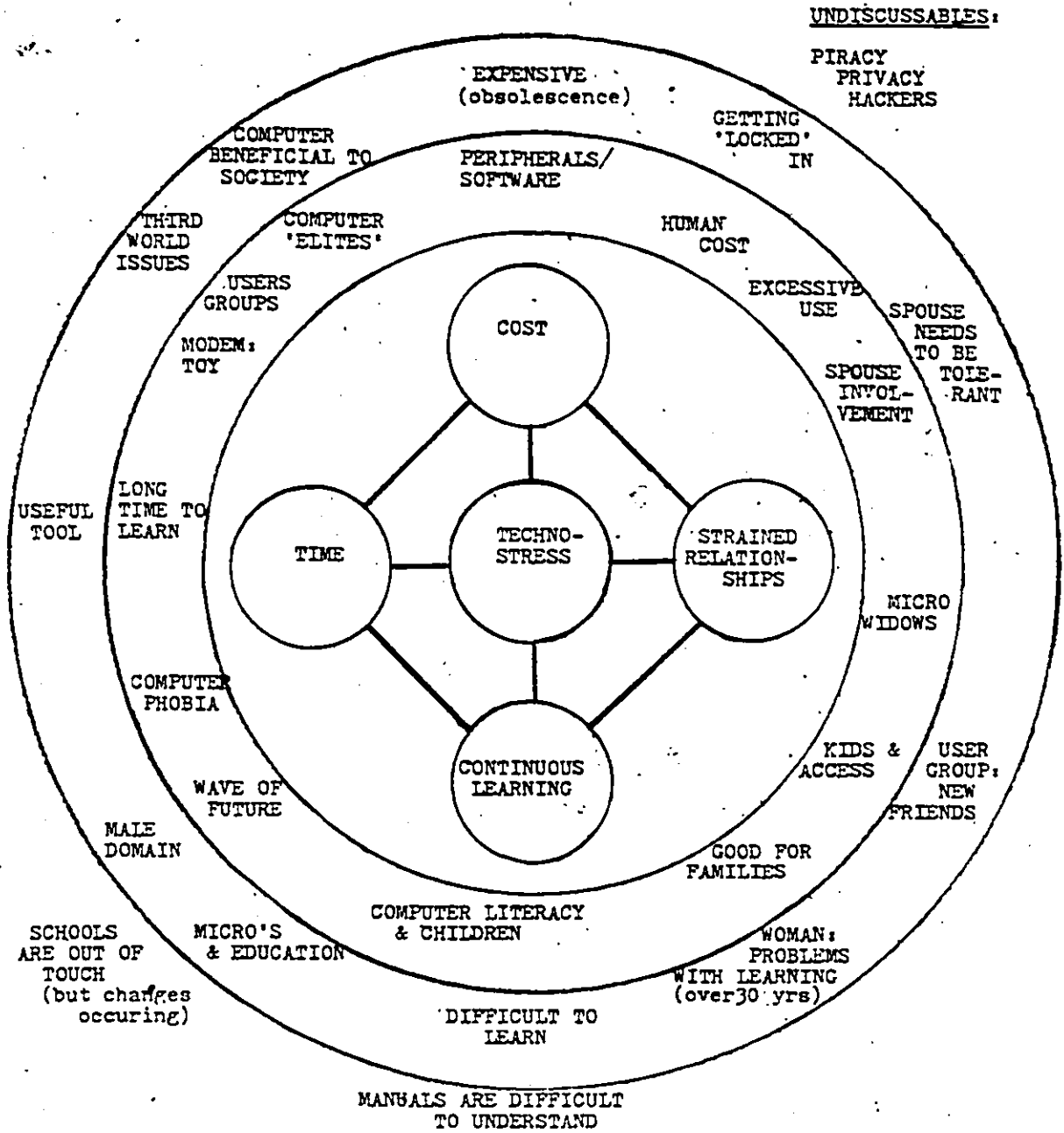
TIME

TECHNO-
STRESS

STRAINED
RELATION-
SHIPS

CONTINUOUS
LEARNING

Figure # 5: THE PHENOMENON-RECOGNITION CHECK



Chapter IX

RELATING THE FINDINGS TO EMERGING TRENDS

This study set out to examine the types of adjustments that people made when they introduced a new technology (in this case, the personal computer) into their lives and their homes. The respondents in this study are a special group within the personal computer culture. As they are such, conclusions will be presented as they relate to the PC culture as a whole, and to the respondents who participated in this research project.

Interpersonal and Interactional Skills

The snowball sample employed to determine participation in this study led the researcher to persons who possess considerable skills in interaction, as well as advanced computer skills. Thus, they are not typical computer users (a fact that didn't emerge until the study was nearing completion). They are able to help people who are having difficulties with certain application programs, and they act as resource persons for continuous adult learning. Many are prominent members of their PC user group. Their names were mentioned by a wide variety of users in this regard, which was why they were chosen to participate.

One thing that should be evident is that they are not the obsessives who have fled into a world of PC use, avoiding contact and dialogue with people, using the machine as an escape valve. This may be seen from their emphasis during the interviews on the role of the users' group, and the concerns they were expressed about the role of their spouses and children in the emerging computer culture. They do not fit the model of the 'techno-stressed' individual so methodologically analyzed by Brod, to be outlined below. Rather, they may well represent persons who are developing a new, more balanced modus vivendi with the personal computer. As such, they may be the fore-runners of a new type of computer culture (more on this below).

Unusual Features of the Heavy Users Learning Styles

The respondents must be seen as 'tinkerers', experimental adapters; they use their skills in all areas of their lives, not just in PC use. According to Kolb (1984:220),

"The relationship between total adaptive flexibility and the person's degree of self-directedness was significantly positive ($r=.26$, $p<.05$), and, as might be predicted, determined primarily by adaptive flexibility in active experimentation. People are actors, directing their own lives, rather than pawns...at midlife, they are determined primarily by adaptive reflexivity in active experimentation."

The study was full of these active experimenters, who were early adopters of PC's in the home.

The notion of active experimentation may be further expanded by examining the effects of the current study on the respondents. Since back-checking is a major component of this type of research (hence the term "collaborative"), it was possible to note the effects, if any, that the research had had upon them. The collaborators used their participation in the study as a method to help in their growth. For example, two of the participants described how, by participating in the study and discussing sensitive topics with their wives, such as overuse, this helped them to make adjustments in their behaviour patterns. They deemed the study to have had a positive influence on their lives. (They also tinkered with the study, too, suggesting ideas, facts, and approaches).

A point that relates to interactive learning is their unusual honesty on the issue of the stress involved in continuous adult learning that was exemplified in the interviews and the back-checks. The users expressed their initial fear of PC's, and their on-going concerns about excessive use, the inadequate role of PC's in education and problems inherent in learning. Contrast this degree of honesty with the users' group survey, where these concerns were put at the bottom of the list. This seems more typical of the macho mentality, a denial that such emotions exist.

The users are unusual among 'high learners' (self-directed adult learners who put a great deal of effort and time

into continuing learning) in that they are conscious of the learning process and their learning styles. They mention, or allude to, learning curves, learning problems, inadequacies endemic in their support literature (computer manuals), the need for a support group in learning (the user group), and, our topic here- the heavy emotional, financial and interpersonal costs of continuous adult learning.

A Third Generation of Computer Users

The media image of the PC user, especially on the topic of obsessive behaviour, is often marked by glittering generalities (Fink:1983;Faflick:1982; Winn:1984;Faber:1984). There seems to be an over-emphasis on the concept of the "computer widow". The gist of these writings is that if one becomes heavily involved with PC's, then one's spouse will, almost inevitably, become a computer widow. However, as has been demonstrated by this research, this may be another case of media oversimplification.

Perhaps the problem with the mass media's categorization of heavy users stems from their ignorance about the development of a PC culture. This ignorance may be grounded in a lack of understanding of the evolution of the PC culture, succinctly demonstrated by Turkle. According to her, the PC culture has seen three distinct generations of users:

1. Generation # 1: the technical hobbyist
2. Generation # 2: the programmer

3. Generation # 3: the "tool" user

It is the position of Turkle, and of this study, that we are now moving solidly into the third generation of PC users. Before this is demonstrated, the earlier generations will be briefly noted.

The technical hobbyist was the fore-runner in PC use; they were the first ones to buy them, and the first to find utility in them. This group embraced PC's as long as ten years ago. They differed from regular hobbyists, however:

"...unlike the case for many hobbies they have tried in the past...it makes them feel a part of something that is growing, and that society at large really cares about." (Turkle;1984:169)

Like the electronic engineer (often the early technical hobbyist) described above, the technical hobbyist found a safe environment where they could tinker with their PC's. Continues Turkle:

"For the technical hobbyist of that first generation, part of what made the personal computer satisfying was that it felt like a compensation for dissatisfaction in the world of politics and the world of work." (1984:175)

The second generation came along after the PC had been made a good deal easier to actually use by the technical hobbyist. This was the generation of programmers, interested in writing new and creative programs. They approached the PC quite differently from the first generation. While the technical hobbyist may have had an interest in programming applications, what the second generation wanted to do was program, exclusively. Here they could live on the edge, with an

impending disaster around each corner. They accepted problems as a challenge, and enjoyed the thrill of developing and de-bugging complex computer codes; contrary to the 'safe' environment of the first generation of users, the programmers applications were fraught with failures.

Related to the programmer, and developing as an outgrowth of programming, came the "hackers". As a recent article in Time magazine illustrates, the term has been misused and abused by the mass media. The topic of 'hacking' has become a popular one for the mass media of late, with such shows as The Fifth Estate, Nightline, and The Phil Donahue Show, devoting entire segments to the issue. While the difference between the hacker and the PC enthusiast will be explored below, it should be noted that the true hackers are responsible for many of the key breakthroughs in modern computer science, including the development of the personal computer. However, since the term 'hacker' has now become part of vernacular, the term will be used here for the purposes of these conclusions. Today's hacker, then, is someone who 'hacks' at a program, making small (or not so small!) changes to make it run better- when it already runs quite well. The original hackers should probably be called pioneers, and were involved with computers long before the PC came on the market. Still, all hackers share one thing in common- what they do is for fun.

Programmers enjoy the mastery of difficult machine languages and programs; the word mastery is the key to the programmers' psyche. While the technical hobbyist enjoyed his safe environment, the programmers Turkle spoke to in her seminal study detailed the pursuit of the pleasures of the unknown. Turkle described this type of activity as being 'transparent'; the programmers wanted to understand the inner functions of the PC, every step of the way.

While these two generations are still a large part of the PC culture, a new generation of users has emerged. Inundated by millions of dollars worth of Madison Avenue's advertising, the new generation of PC purchasers approaches the computer with a completely different attitude than did their predecessors. They are not, for the most part, technically oriented; they want the machine to do things for them without knowing how. They want to use their PC's as a tool.

Disillusionment: What Uses Does a Home Computer Have?

This new generation is expanding into a multiplicity of styles, states Turkle. However, a huge segment of these purchasers are becoming disillusioned with their equipment, as several respondents suggested. This is the myth of what the computer can do. Advertisers promise great things, but as one recent article noted:

No matter how many features are provided, many feel the home computer might not have any compelling uses. (Pollack; 1985:4C)

The PC became a status symbol, as one respondent observed, instantly conveying the purchaser as 'high-tech'. Few purchases of such magnitude came with such great expectations. "It is unusual for people to come to a major purchase with so little prior knowledge", states Turkle (1984:185).

Enter another variable into the situation: the rapidly changing technology. This will probably be the last year that 64K machines will be credible. The technology forges on; machines are becoming easier to use, but this alone may not be enough. People still seek answers to the key question: What is it good for?

A large segment of the population have found usefulness in the PC. The heavy users of this study were not youngsters involved in hacker pranks. They were mature persons with a heavy investment in applications programs known to become almost a part of the user's communications and thought processes: word processing, data base management, spreadsheets, etc. These programs take time and resolution to acquire, and those skilled in them, observably, do not defect from them.

A word processing program, such as Gutenberg, can have its 'personality' modified by its user- a process in the course of which the user's writing style itself comes to be redefined. Such programs become "extensions of the user's nervous system", in a way; hence their permanence.

The Apple II series has proven itself over a period of time. It may be expanded to 128k and, more significantly, it

is one of the most flexible (and easy-to-repair) machines to date, with its 'open' architecture, allowing new peripherals to be added easily. It also has a mass of programs available (over 14,000), many of which are useful for learning, or for use in running a small business from the home, while in IBM remains a business-user's machine (witnessed by IBM's recent decision to get out of the home market- see Pollack:1985). The new generation of PC's are closed architecturally, making it more difficult to add new and innovative peripherals.

An important issue for the respondents was the role of the PC in the educational system. The school market is only a fraction of the home market; however, many people buy their children, and themselves, the same unit that the children learn on at school. Since Apple Computers perceived this very early in the game, they began to offer discounts to educational facilities that bought Apples in bulk orders. As respondents clearly stated, children were often a prime consideration in the decision to purchase a machine. Therefore, Apple would stand to gain from an educational system that employed their machines.

Reactions to Obsolescence in The Apple II Technology

This brings us to the future of the PC, an often troublesome and highly speculative area of PC research. As this study has repeatedly suggested, the Macintosh ushers in a new era of PC use. This machine's friendly technology should

speed up answers to the question: But what is it good for? The technology of the Macintosh is very advanced for this generation of PC users, yet it is still very much like a glorified toy, with its mouse and icons. It is also very expensive, making it prohibitive for many of the new generation of users, especially those with a heavy investment in hardware, software, and applications programs skills.

The respondents as a whole were not overly impressed with the Macintosh. Only one respondent stated that he would be willing to buy the new technology. But he was more interested in the new (and inexpensive) Atari Mac-clone, due to be made public very soon. This respondent is mainly using his PC for advanced adventure game-playing; therefore, his commitment to the Apple is limited to gaming applications, from which it is easily possible to defect.

There are very good reasons why the users refuse to defect to newer technologies, besides the obvious cost factor (bear in mind that we, as a society, scrap our automobiles after a short time). They have invested a lot of time to learn the protocols of their Apples, and consider the machine to be 'tried and true'. Also, they have come to enjoy their computer as a tool, as Turkle suggests, and have become attached to its features. The Mac and the its clones are new, untested and limited in range of available application programs, as of yet. (The Mac's strengths are in graphics, which are not a major area of interest of most of the

heavy users). The users feel comfortable with the programs that they use on their Apples, and they have a large variety of programs to choose from. The cost of re-learning a new technology will be higher than the cost of simply replacing their system (many megabytes, on floppy disks, will have to be re-configured, for instance). Besides, 512K of RAM (Mac's ability), may be more than is required for home users, at least for the current generation of home applications.

Huge outlays of time have locked the heavy users into their Apples. This expenditure of time has created a certain amount of stress in their relationships with the people around them. How they reacted to this problem relates to the reactions to the constructions of their reality. If they now decided to switch systems, they would have to begin all over again, at enormous expense, the loss on their obsolescing systems compounding the expenditures on new hardware and software. Perhaps the level of stress is something that they do not want to have to go through again (they know themselves, and realize that they might be drawn into another obsessive pattern of behaviour with the new technology).

Technostress

The concept of techno-stress was at the core of one of the reconstructions used for the phenomenon recognition process. Brod clearly demonstrated how the new technologies

have affected both users and non-users, and his theory was pivotal to the understandings reached by the researcher in the course of the current study. A brief outline of Brod's theses will be presented, since these ideas were deemed to be so relevant to the present study.

According to Brod, PC use causes an alteration of the sense of time (often described by respondents in the current research). Computer work is a solitary, anti-social activity, devoid of demands on the imagination. The emphasis is on speed, dilution of motor activity, resulting in chronic lateness for meals and bed. Time spent with friends and on exercise is also reduced. Users accelerate to suit the machines' pace of operation. Disputes over time spent on the machine are a major source of conflict with the spouse.

PC use is unsuited to certain thinking and learning styles, due to the masses of decisions, in quick succession, that may create mental strain and fatigue. This activity is intensified by focused concentration at a high pitch of mental engagement. The resulting mental fatigue is a pre-condition of techno-stress, for the user often carries on until exhausted. The user may become intolerant of any breaks or interruptions, which is basic to the syndrome. New, more powerful programs demand more time, resulting in a still higher mental workload. The screen has no end; the machine never sleeps, and there is little time to reflect on what is happening. The user becomes subordinated to the logic of the machine.

Techno-stress is amplified by working with a "perfect" machine. There is a compulsion to master the technology, and yet, there is always a new technology, product or package waiting in the wings. The smallest error may result in huge losses of data, or cause the machine to get 'hung'. Users become tempted to improve on already good solutions, aiming to excel, or least match, the perfectionism of the machine. This order and predictability may lead to an obsession.

While small errors may create stress, larger or increased errors, after long hours on the machine, may exacerbate the problem. This in turn adds to the user's fatigue level, and errors may multiply. A sense of frustration sets in, along with a feeling of imperfection, compared to the machine.

Computer involvement begins to colour all other interactions: intolerance of human relationships sets in. Emotions are not logical, that is, they don't "compute". There are no feelings of guilt associated with computer usage; the mechanization of the mind requires that insights into feelings be non-computable.

After intensive work sessions, the user has a desire to be alone. A sense of superiority is present, since being "techno" means being more than human. Introverts and loners are at the greatest risk in this instance. A lack of ability to empathize or express care, and the inability to switch contexts from machine interface to human contact, creates increasingly rigid thinking; only cognitive needs are met, and emotional needs suffer.

Finally, the feeling of isolation sets in. Relations with others may now occur via the machine, such as information exchange. These communications are brief and utilitarian, devoid of nuances or ambiguities. Lust is superceded by the playing and control functions of the brain.

While the scenarios described above may seem extreme when compared to the present group of users, it must be stated that Brod spent many years analyzing the computer users. There are a number of elements which do relate to the current findings, however. The concept of time was very important to the respondents, who often spoke about feeling "burnt-out" after long hours on the machine. Respondents also described mental fatigue, and the problems of trying to uncover errors in a program, expressing similar concerns described by Brod. During the phenomenon recognition checks, they were primarily drawn to the chart that was based on Brod's concept of techno-stress, as opposed to the person-card technique.

The Brod text provided an excellent frame to employ as a comparative tool, for the purposes of this study. While the respondents of the current investigation have not become as extreme as the users that Brod analyzed, much of what Brod discovered seems to have occurred, to some degree or other, among these users. If the current study group had incorporated programmers and hackers, there would likely have been greater comparability between the two studies (cf. Turkle

and Frude, as two examples that support the findings by Brod). It will be up to future researchers to support or refute Brod and Turkle's findings, in a variety of settings.

Brod argues that there is an immediate need to counteract the issues and problems described above. More enlightened approaches to the technology are needed:

We need to respect the human dimension in work and communication... And, we need to reject the seductive notion that the values of the machine are values worthy of emulation." (1984:100)

The users of the current study seem to be forging such a more enlightened approach, and may represent the fore-runners of a new wave of PC users who can, to some extent, withstand the temptation to become obsessives. They could be highly regarded models for other users to emulate; they certainly are currently highly regarded within the computer culture.

More Undiscussables: Piracy and "Hacking"

One issue that was rarely discussed by the respondents of the current study was the issue of piracy, or the illegal copying of protected software. The piracy issue must be regarded as separate from the issue of illegal break-ins of huge data banks; the two issues are often confused by scholars of computer ethics. It is very important that these two issues become separated, for there are much different consequences as result of each action.

It seems apparent that many PC enthusiasts are expert at cracking copy-protected software; these are often made for friends. This is the "try before you buy" principle, which grew out of sense of frustration that resulted from the purchase of poor software. Given the often misleading claims of software developers, most users prefer to obtain a copy of a program before they commit themselves to buying a particular piece of software. (Such a commitment involves both the purchase of software, manual and up-dates, and a commitment of many hours of time, so it is not lightly embarked upon <cf. Carney and Edwards; 1985:3>).

The Whole Earth Software Catalogue noted that after a program is pirated, if a user really likes what s/he finds, then it will be purchased. The authors advocated the elimination of copy-protected programs, for they feel that this simply encourages sophisticated copying techniques. This adds a certain "criminal" element to the computer culture. Whether or not this type of activity is any different than the taping of a favourite album onto audio cassette, as one respondent suggested, is doubtful.

The respondents didn't really discuss the issue of piracy until they were asked about it, during the phenomenon recognition check. It seems evident that this is really a non-issue for them, because the fact of the matter is that it is quite a common occurrence across the entire computer culture. When the users were queried about this issue during

the back-checks, they mentioned that they bought the programs that they used extensively, for it represented a better quality program with support materials, confirming the hypothesis of the WESC.

What the media image of the "hacker" is involved in is a completely different matter, however. This highly intelligent group is usually between the age of 10-25 years of age. While breaking into a data-bank would never occur to the heavy users who collaborated in this study, for these hackers, this is their 'raison d'etre'. The mass media has been giving these hackers a lot of coverage lately, since so many classified computer systems have been broken into by young computer enthusiasts. (One of the more popular movies of 1984 was "War Games", which centered on one young man's attempts to break into the NORAD military computer). "Pirate" electronic bulletin boards have sprung up across the country, and a cult of hackers use their secret passwords and pseudonyms to exchange the latest tips on how to access telephone services illegally, and to exchange sophisticated 'break-in' programs. This trend seems to be quite the opposite of the notion of "Big Brother is watching you", often found in the literature since Orwell's classic 1984. For the present, breaking into the continent's computers seems to be in the hands of young enthusiasts (perhaps they should be called "B & E Hackers"...

The major peripheral that allows the hacker to roam freely across the electronic landscape is the modem. The respondents feel that the modem is still a sophisticated toy; that is, it has yet to live up to its great expectations. In fact, in the early days of PC developments, the prophets of computer-communications hailed the advent of electronic communication as a great equalizer for all peoples of society. We would be freed from the tyranny of workplace. (Tofler; 1980; Martin: 1979; Hiltz/Turoff; 1981; Dertouzos and Moses; 1981). Winner (1985) describes this phenomenon as the "mythinformation" of the high-tech era.

For the moment, the reality of modem usage is quite different. Masses of people are not working from electronic cottages, nor are they shopping from the home with a Telidon terminal (Douglass & Parkhill: 1982). Modems are hardly even being used to share knowledge and resources amongst computer enthusiasts. This is largely due to the fact that modems can be extremely difficult to operate; problems are endemic, and many of the respondents complained about the inherent difficulties, especially with the Apple II. It is still quite an expensive pastime, as some respondents stated. Carney & Edwards argue that the modem and electronic bulletin boards will not become a mass medium until:

"...some kind of 'user-friendly' shell surrounding the communication program's operating system will probably prove necessary before the modem can become a mass communication medium." (1985:1)

Lest it seem that the modem is unserviceable, it must be noted that there are currently many thousands of local electronic bulletin board services now in place across the continent. However, until a formula can be found that makes the local e.b.b.s.' space or its contents saleable, it seems unlikely that they will develop into the equivalent of community media. Meanwhile, the local boards do not attract the (highly utilitarian) heavy users who collaborated in this study: these boards have virtually no 'public domain' software to download (and if they had, there would be no manuals to accompany it).

One reason why the users did not really seem very interested in information systems is that this may be a societal issue, and not a personal one. While they realize the potential of the new computer-communication systems, they see computers in terms of "people" issues. They are individualistic, not concerned with government regulation issues. Since they are mainly interested in practical applications of their PC, societal issues are not so evident in their discourse.

The Personal Computer as a Tool and an Extension of the Self

What this research has tried to point out is that the computer is not simply a neutral machine, as some would have us believe. It is an interactive learning device, which can be configured to the user's personal needs (hence, personal

computers). As WESC points out (Brand: 1984), the PC is potentially an "extension of the human nervous system", and is spreading out and touching our lives on more and more fronts.

The computer is a logic machine; as such, it becomes a mirror of the logic of the user's mind, once the mere/mechanics of getting it to do what you want it to can be overcome. People discover themselves, their abilities and their sensibilities- reflected back in what they can get the technology to do. Most of the heavy users have 're-invented' uses for the machine, or even written their own programs for it. They discovered applications for applications programs, that were not contemplated by the originators of these programs. The computer gives immediate reinforcement for every successful realization; it leads to the emergence of self-competitive and self-initiated learning. Ultimately, these skills will become broadly based in the population as computer use proliferates.

The PC is not the panacea for the many ills facing society as a whole. Instead, it may be the vehicle of many changes to come, as many scholars have suggested. As a tool, it extends our capacities, so we have to re-think who we are. Whether or not the problem areas that have been outlined in this study remain with us, or are simply growing pains, remains to be seen. However, as this study has revealed, there are at least as many promises as problems in the issue

of PC's in the home. Future researchers are likely to find this to be a truism, as the topic gains in popularity amongst communication scholars.

Summary

Many scholars have hailed the computer as the saviour of society, as has been carefully demonstrated throughout the course of this research (cf: Toffler; 1980; Martin: 1979; Cornish; 1982; Hiltz/Turoff; 1981; Masuda: 1981). It seems safer to suggest that, like any 'new' technology, much depends on how we, as humans, decide to intergrate these amazing machines into our lives. There is really nothing to save ourselves from ourselves; to this end, the computer is merely a powerful and flexible tool.

Chapter I

CONCLUSION

Mythinformation

Throughout the course of this study, there has been an attempt to compare the literature on computers in the home with "real-world" experiences of computer users. Many of the concepts that were initially presented, such as computer widows and computer addiction, seem largely to be media creations. Hence, what this thesis has argued is that this trend is in fact a case of media "mythinformation": the media is simply not in touch with what is actually occurring among the users of PC's. A graphic example of this "mythinformation" is the concept of the electronic cottage. Instead of workers 'telecommuting' from their homes, what may instead be emerging is the 'electronic sweatshop'. The utopian vision often cited by Toffler and others may now appear as dubious, at the very least.

Perhaps the mass media in general, and writers of future trends in particular, need to re-examine their motives behind their predictions. There are many serious questions that need to be raised about the effects of computers on our lives. Hopefully, studies such as Turkle, Brod, Giacinta, and the current one will help to set the problems and prom-

ises of PC use in the home into a theoretical framework for continued debate amongst scholars of all fields.

Unusual Characteristics of the Heavy Users as Continuous Learners

One of the more interesting findings of the study is the level of awareness that the users had about continuous adult learning. According to Kclb (1984), adults are not supposed to perceive of hobbies as tools for continuous learning. They seemed to be aware learning styles (eg-the user who designed a 'help' program for beginners), about learning curves (eg- "...you have to get over the hump in learning", stated one respondent) and resources of learning (eg- the formation of users groups and the development of 'help' networks amongst the users). This finding seems to add some insight into the whole notion of continuous adult learning, for the PC is a very powerful tool for learning many varieties of applications, as has been carefully demonstrated throughout the course of this research.

Different Meanings of PCs to Different PC-user Subcultures

The notion of what a computer is useful for is currently going through a period of transformation by the current era of users. As has been illustrated, the personal computer had three distinct generation of users. However, today's 'third' generation seems to be uninterested in how the machines do what they do. The fragmentation of PC users into a variety

of sub-cultures seems to suggest that we may expect computer applications to branch off into many new areas that are only fleetingly perceived today (as in the Macintosh technology). Such developments will usher in a new era of PC utility, as a broader base of users begin to demand that their machines perform the tasks that they want them to, with a minimum of expertise.

Inevitably, users will want the PC to take over more of life's day-to-day tasks. When microelectronic technology merges with robotics, and these new creations are introduced into the home, a new set of expectations will emerge amongst the buying populace (these devices are already available in prototype form, such as the HERO I robot for the home).

Interview Generates Different Results from Those of Questionnaire

A final note on the use interviews is necessary. It seemed to me that by employing the in-depth, unstructured and intensive interviews, I was able to uncover many findings that did not emerge from the user group survey. However, much of this information is contextual in nature; it was necessary to employ triangulation, in order to cross-check the findings with a wide variety of sources. Having done this, it seems that the interviews were a powerful technique for examining real-world experiences of people involved in PC use. Instead of relying solely on the literature, or on survey driven inquiries, this study was able to

employ a wide variety of methods to offset the deficiencies and biases that result from any one research technique. The contextualistic perspective is basic to new paradigm research (cf- Georgoudi & Rcsnow;1985:pp.76-88).

The goal of this project was always to uncover the thought worlds of personal computer users. By employing these various tools of research, it is hoped that new and interesting findings have emerged, and that the reader has profited from this project.

Appendix A

NETWORKING: UNCOVERING DIFFICULT-OF-ACCESS RESEARCH

When a researcher attempts to investigate a topic that is on the leading edge of the field, or has difficulty in locating relevant empirical data, the task of comparative analysis is a difficult one. As has been stated, the introduction of the PC into the home has been the subject of debate rather than analysis. While there may be many studies that have been initiated in the past year, such as this one, the lag time in publishing such articles means that it may be months or even years before such studies reach the hands of interested researchers.

During the course of the present study, one method used to obtain relevant information was to directly contact researchers who were conducting empirical research. Of course, this required that these sources be identified. This would often occur while reading computer magazines, weeklies such as Time or Newsweek, or simply during a program on the radio or television. Whenever a study that might be relevant to the present project was cited in the mass media, the person/group was contacted immediately.

According to the uncertainty reduction theory (Berger & Calabrese in Albrecht & Adelman; 1984:17),

"...people are motivated to communicate with one another in order to understand (describe, predict, or explain) another's behaviour. The process of reducing mutual uncertainty facilitates continued interaction."

This theory has been more commonly described as 'Networking' by its proponents (Ferguson:1980; Naisbitt:1982; Lipnack & Stamps:1982). Following the uncertainty reduction theory, relationships deemed to be supportive by the recipients are usually those where the provider is able to gauge how to be supportive; they are able to understand the problems faced, and are able to adapt their communication strategies to be perceived as helpful (Albrecht & Adelman;1984:18).

Larger networks of denser cliques unconnected to one another allow the researcher the freedom to move and to try new behaviours and learn new information (Albrecht & Adelman;1984:21). The network is a flexible entity, "...with each member at the center." (Ferguson;1980:213) Networks promote the linkage of their members with other people, and other networks.

According to Naisbitt (1982:197), networks cut diagonally across the institutions that house information and put people in direct contact with the person or resources that they seek. For example, one study (SITE:1984) was obtained after reading a brief article in TIME magazine. By writing directly to the head of the research team, the study was obtained almost immediately. However, were one to wait for the study to be published, it would have taken at least 6 months

before being reviewed in a journal, according to the authors.

Few organizational theorists have yet studied networks because they are evanescent, ebbing and flowing around issues, ideas and knowledge, claim Lipnack & Stamps (1982:236), who wrote the book 'Networking' on this topic. Albrecht and Adelman (1984:6) add that much of the literature on networking and support systems is largely atheoretical. They continue that:

"...whereas hierarchies regard social organizations as more important than their human members, networks accord equal importance to the individual and group." (1984:9)

By embracing the concept of networking (one that is basic to the computer culture), the present study has been able to benefit significantly from studies that it obtained by networkers. Several key papers were obtained, not by exhaustive literature reviews, but by keeping a watchful eye on the mass media (i.e.-Site, Brod, Fink, Pratt, Turkle). When contacting these scholars, the approach taken was one of reciprocity. If they would be so kind as to send a copy of their report or findings, we would reciprocate by immediately sending a copy of the study on the electronic cottage (Edwards:1983), and also, the thesis or report on findings, when complete.

In virtually every instance, the networkers responded positively. Often, they would have a lead that could be pursued to obtain further studies, as in the case of the Fink connection.

A greater sense of awareness was the end goal for both parties. States Naisbitt: *

"As each person in a network takes in new information, s/he synthesizes it and comes up with other, new ideas. Networks share these newly forged thoughts and ideas." (1982:194)

Synergy, the bonus of energy that results from co-operation in natural systems, can be used by researchers too, states Ferguson (1980:215). As the present study demonstrates, the concept of networking is an emerging pattern of sharing as a new form of communication.

The research uncovered by networking include the following: Burham:1984; Cohen:1980; Cornish:1983; Dotto:1980; Fink:1983; Giacquinta et al.:1984; Glossbrenner:1983; MacDougall:1981; Pratt:1984; TVOntario:1985).

Appendix B

SURVEY OF USER GROUP

INSTRUCTIONS: Peel the sticky labels off and place them as follows:

1. choose what you feel are the six most important items, from your point of view
2. feel free to write in any item that may not be listed, but that you feel is important to you at this time, in the blank label provided
3. place the most important first, the second most important second, etc. (the item that you have written in could be among these)
4. remember, pick only six (6)

1)

2)

3)

4)

5)

6)

PLEASE TAKE THE TIME TO CHECK WHERE APPROPRIATE:

- I currently own/lease : nothing yet
 keyboard, microprocessor
and TV/monitor.
 disk drive 1() 2()
 joystick/paddle
 printer
 modem
 mouse/graphics pad

STATE ROUGHLY (check one only):

- # of programs in use- 1-5
 6-10
 11-15
 16-20
 20+

- # of disks owned- 1-20
 21-40
 41-60
 60+

- Hrs. per week using computer- 1-5
 6-10
 11-15
 16-20
 20+

CHECK ONE:

I am: MALE
 FEMALE

AGE under 20 years old
 " 30
 " 40
 " 50
 50+

THANK YOU FOR TAKING THE TIME TO HELP US IN THIS MATTER. WE
REALLY DO APPRECIATE IT.

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Chapter XI

VITA AUCTORIS

Christopher Edwards was born on May 15, 1956, in Windsor, Ont. He attended L'Eccle St. Edmond, and Brehnan S.S., Patterson Collegiate S.S., and graduated from Lowe High S.S., Windsor, in 1974. He received a certificate in Real Estate, and in Rural Real Estate, from St. Clair College, Windsor, in 1979. He received his Honours B.A. from Windsor in 1983. He received his Master's Degree in June 1985.

An active member of the university politique, Mr. Edwards served as graduate representative to his department council, the Graduate Student Society council, and served on the University of Windsor Senate. He was also a member of the Senate Executive, and served as a member of the Senate Committee for Teaching and Learning.

Mr. Edwards has worked: as a radio instructor in the initial stages of student radio CJAM's pilot community access program; as a technician for the Canadian Broadcasting Corporation; as a public relations co-ordinator for the Windsor Separate School Board/Glengarda School for Exceptional Children; and as president of Vidiots Productions Ltd. He has also produced voluntary video productions for the Windsor Chamber of Commerce, the University of Windsor Lancer Track

team, and the Dept. of Communication Studies, University of Windsor.

The recipient of several Reader's Digest of Canada Fellowship Awards (1982-85), the University of Windsor Summer Bursary, and the President's Roll of Scholars (1982-83), Mr. Edwards was a recent conference participant at the American Business Communication Association, where he co-presented a paper on electronic bulletin boards with Dr. Tom Carney. He also attended the UNESCO/Learning Systems Institute's "Consultation on the Collaboration into New Communication Technologies" at Florida State University, Tallahassee, Fla., where he was elected rapporteur for his working group.

Mr. Edwards has travelled to 17 countries on four continents, and plans to pursue his travels into Asia. He expects to publish a text of his journey, (and will take all the photographs for this).