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AN EVALUATION OF THE METHOD OF RANDOM ACTION SAMPLING

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PREFACE

The thesis consists of papers that in one way or another reflect people's naturally occurring behavior. The aim is not to map or analyze all the different types of behavior man is capable of, but instead to develop a way to study this behavior with a minimum of interference.

Many years of intensive labor lies behind this thesis. From time to time I have been stressed, but never bored. In my work I have had the unique opportunity to combine behavioral interest with an enchantment for what computers can be made to perform.

The decision to devote my time and energy to behavioral research was taken during spring 1982, while I was still working as a teacher at a folk high-school in the northern part of Värmland. I was admitted, in spite of hard competition, and a new chapter in my life began.

Many bridges have been crossed since I became a doctoral student. Then, I did not know much about practical research or the use of computers. Today, this thesis is an evidence of improvement of the former, and concerning the latter analyses and layout are these days made with ease and speed on a personal computer. I am even teaching programming.

To present a thesis makes one proud. It is one of those easily counted events of a life-time. The only thing I am more proud of is my daughter. In finishing the thesis in Stockholm, we were deprived of each other's company more than any one of us wanted. Now back in Göteborg I have tried to make amends .

The work on my thesis represents a significant part of my life. Many persons and organizations have been involved. I want to thank each and everyone for a most rewarding cooperation.

The director of the project to study people's everyday behavior has been professor Lennart Sjöberg, who also is co-author on two of the included papers. You trusted me to carry through the different studies with a maximum of freedom. Behind every successful dissertation there is always a cunning and devoted mentor and so even in my case. It has been a privilege to work with you and I want to extend my most sincere thanks. I think you are as content as I am that this project finally has come to a crescendo.

The economic foundation for the project was first granted by The Bank of Sweden Tercentenary Fund, and later by the Swedish Cancer Fund and the Swedish Council for Planning and Coordination of Research. Different kinds of resources have also been placed at my disposal by the University of Göteborg and the Stockholm School of Economics. I am indebted to all these organizations.

Next I would like to thank all those, to the reader of the different studies, anonymous participants without whom nothing of what this thesis is all about

could have been possible. It has been great fun to work with them and their conscientious work is an unique experience to me. It should be understood that they have invested far more time and effort for behavioral science than is normally appreciated while reading about them. They deserve every credit given to them here.

Quite a few persons have been involved in coding the questionnaires and reading the data into computer files. They all deserve an acknowledgment for their careful work. This goes to an even higher extent to Carl-Gustav Björhag for supervising all coding and for his systematizing of the coding schedule. Thanks also go to Gunilla Lieff, who at one time was employed in the project.

I specially want to thank Lillemor Östlund for administrating the economic side of the project during all years and for checking specific parts of the manuscript of the thesis.

In the phase of completing the thesis, I most sincerely want to thank professor Charli Eriksson, National Institute of Public Health, and professor Claes-Robert Julander, Stockholm School of Economics, of my thesis committee for their highly relevant and valuable comments on my work. I am also extremely grateful to both Ph. Dr. Lars Ramström, head of research at the Institute for Tobacco Studies, for his most valuable comments on the study of smokers and professor Ulf Rydberg, Karolinska Institute, for his most valuable comments on the study of drinkers. All their efforts to enhance the scientific quality of this thesis have been greatly cherished.

Finally, to all those who have taken a personal interest in my work and career and whose interest have facilitated my attaining this goal, thank you. This holds especially for my aunt Mrs. Ebba Wagner, who's love and care have followed me always.

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CONTENTS

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ABSTRACT

The aim of the present thesis is to present and evaluate a method for collecting data on people's everyday experiences and behavior. It is based on several studies performed on several hundreds of subjects, presented in five papers. In the introduction the theoretical background is given along with a brief presentation of the different papers. Emphasis is next placed on the methodological development, beginning with a presentation of the technique and a pilot study, continuing with subjects and sampling procedures and lastly data analyses. The empirical papers are then accounted for in summarized forms, followed by comprehensive analyses, the most important of which concern the reliability, validity and rationality of results. The main results of the studies are that the method of random action sampling (a) has proven to be a very sensitive instrument for mapping people's self and actions; (b) can be used in applied experimental designs with the objective to achieve a desired effect; (c) gives an abundant flow of data leading to new theoretical constructs, which can be extracted from different types of analyses, and old ones can be put to test. The papers are discussed in relation to other kinds of methods and the application of the method of random action sampling is discussed in relation to the society of behavioral theorists and practitioners, concluding with some prospective suggestions.

Key words: RAS, random action sampling, time-sampling, naturally occurring behavior.

The completion of this thesis was made possible by a grant from the Stockholm School of Economics.

INTRODUCTION

Theoretical background

Who is interested in the whereabouts, doings and experiences of ordinary people in their everyday life? I for one am. Maybe that is why I have invested so many years of labor in behavioral science.

Behavior in natural settings has been studied before. Maybe the book "One boy's day" (Barker & Wright, 1951) can be said to have announced the dawn of the ecological approach in psychology. One of the very first to raise the question of ecological representativeness in psychological studies, was the ecological psychologist Brunswik (1956). A theoretical outline of ecological psychology was presented by Barker (1968). However, ecological psychology soon became preoccupied with mapping the environment in terms of *behavior settings*, thus turning away from describing spontaneously occurring behavior.

The empirical study of naturally occurring behavior is difficult for many reasons. The method used should intervene with the lives of the subjects as little as possible. If it is too awkward, the subjects will feel and act a little different than otherwise. Observing the subjects will of course often not do, so asking them to report about their lives is perhaps the only feasible way. The actor must be assumed to have privileged access to this type of information (Harre' & Secord, 1972). However, even if it is believed that subjects can, and are willing to, truthfully answer questions about themselves, the reports must be subjected to evaluations concerning reliability and validity.

Usually researchers are not interested in describing the whole population of a country, but instead, either groups of people representative of the whole population, or categories of people of special interest, for one reason or another. Further, even if longitudinal studies are performed, they are infrequent in psychological studies, and studies following a group of subjects every day over some period of length in time are scarce. Usually a whole battery of questions is answered one time for all.

Suppose a researcher would be interested in how people use their time. One possible method would be to interview them a couple of times a year, about what they did yesterday and for how long time. This method has been employed by Eliasson and Klevmarken (1981) and Klevmarken (1984, 1986). Other researchers conducting time budget studies have used similar methods (Chapin, 1974; Szalai *et al.*, 1972; Ås, 1986), and so have even some environmental psychologists (Ahrentzen, Levine & Michelson, 1989).

Even further, suppose a researcher is interested in people's *naturally occurring behavior*. Then an even more refined method must be utilized. This method must be based on repeated measurements of subjects over some significant period of time. Even if this *time-sampling* resembles the yesterday interview method, it must be noted that asking people to give a report of their ongoing activity, is something quite different from asking them to report how much time they have spent on various

activities. It is also a quite different approach from the one used by economists, when collecting retrospective reports about chunks of time in diaries.

The time-sampling method was first developed in a group of researchers under the leadership of the psychologist Csikszentmihalyi (1975) at the University of Chicago. It builds on the technique for wire-less transmission and the method of self-observation. The potentials of the method were soon appreciated by other researchers (Brandstätter, 1981, 1983; Kirchler, 1984, 1985; Pawlik & Buse, 1982; Sjöberg, 1981) and further elaborated by Csikszentmihalyi and Larson (1984). The only study conducted in Sweden known to me, except for those presented in the present thesis and Sjöberg (1981), involved five men and five women, and must be regarded as a pilot study (Lööv & Rosengren, 1988).

Another original idea to sample people's everyday behavior was to build in a video-camera in people's TV set, thereby being able to tape what, when and how people watched TV (Collet, 1987). The possibility to combine different methods can only contribute to the validity of results (Jarlbro, 1988). Prior to those studies, Csikszentmihalyi and Kubey (1981) used an action sampling technique to document people's habits to watch TV.

One aspect of the importance of studying everyday activities lies in the belief that they are means by which goals are attained, as has readily been demonstrated by Gärling, Lindberg, and Montgomery (1989).

Following Jahoda (1961), Pervin (1976), French (1978), Hoefert (1982), and Holland (1985), to mention only a few scholars interested in *person-environment* fit, Brandstätter (1994) reports a number of studies conducted during 1979-1987. The method used was a time-sampling diary (TSD) of subjective experience in everyday life situations. The subjects reported on the average four times a day according to a time-schedule, during 30 consecutive days. However, this type of time-sampling can not be expected to give high validity of answers, since the subjects' awareness about the arrival of a scheduled time to report, might affect the person-environment constellation. Consciously or unconsciously they can move towards or away from a situation.

This possible lack of validity is easily coped with by letting the time points for reporting come to the subjects in an unpredictable manner. With some kind of technical device, signals can be transmitted to the subjects at random intervals. This way the subjects will always be 'caught red-handed', with much less chance to divert the situation compared with the TSD method.

Furthermore, the inherent weakness with all retrospective reporting is memory failures. As memory of an event fades away, detailed information is lost. If asked about details after a span of time, an obliging subject is most likely to start fabricating, if he or she really does not remember. Even if this fabrication presumably is an unconscious distortion, the trustworthiness of retrospective reports must be regarded as inversely related to the elapse of time.

The method accounted for in this thesis is called *Random Action Sampling* (RAS). It fulfills the criterion of unpredictability of the times to report and it gives high creditability to the reports, since the time-lapse between instigation and retrospective reporting is forced down to a minimum, usually less than 15 minutes.

The approach to studying naturally occurring behavior used here, is that of studying *acts*. An act is a phenomenologically clearly defined entity. Just as the behavior setting is a central concept of ecological psychology, the act is the key concept in RAS. An act is not simply a useful theoretical construct, it is the password for the subjects' understanding of what is in focus. When signaled to respond, the act when the signal came is the one to be reported, and no other one. The act is defined to be composed of an *action* and a *state*. The action is the ongoing activity, like reading, walking or watching TV, while the state is something rather synonymous with the predominant mood of the subject, like relaxed, happy and imaginative. Further elaboration will follow later.

Psychological theory has the same predicament as theories of any other scientific discipline: the explanatory power is closely linked to the data yielded by its methods. However, compared with many natural sciences, where laboratory experiments is the predominant and legitimate way to collect reliable data, the laboratory preference of many psychologists is hard to understand and almost opposite to the aim of psychological research. The objective of psychology is to study *human behavior*. This should include a study of people under normal conditions. Why then are the two groups most submitted to experimental manipulations *psychology students* and *albino rats*? I agree with Sjöberg (1991), that what psychological problems to study is often decided with a view to methodological convenience, which in turn means that assumptions concerning the constraints on subjects are covertly carried over from the specific experimental situation to theories of action in general.

This lack of enthusiasm about going outside the laboratory experimental settings, and the unwillingness to fully appreciate the connection between choice of methodology and reliability and validity of data, has created too many speculative psychological theories. Probably only a minor part of them would survive if tested in a natural setting. Not so few psychological researchers are known to have stressed strong causal relationships from far too small and uncertain data.

Modern technology is essential for the method presented in this thesis. The reliability and validity of the data collected with RAS, as will be shown in later sections, are very high. In spite of that, the inferences drawn from the data are based on somewhat restricted descriptive and explorative analyses.

Dependent of course on the design of a study and the elaboration of the means of response, the method gives a more or less abundant set of data. However, the degrees of freedom appear to be quite large, enabling investigators, on condition that they can motivate their subjects, to tailor-make their studies for maximum data output. The next logical step in the development of RAS would be to use the method in hypothesis testing.

To sum up, the papers of this thesis present different studies using the method of RAS. The purpose of these studies was to develop the method while investigating the way everyday acts are described and explained by the actors themselves and to relate the attributes of these actions to internal (personal) and external (environmental) determinants. The overall purpose of the thesis is to evaluate the method of Random Action Sampling.

Presentation of the papers

The five papers of the thesis are the result of a considerably larger number of different studies. A survey is presented in Table 1.

Table 1
Presentation of the Data of the Five Empirical Papers of the Thesis With Respect to Kind of Study, Time Period When the Study Was Conducted, Type of Subjects and Group Size

Presented empirical paper	Time period	Type of subjects	Group size
1. Sjöberg & Magneberg (1990)	1983-1985	Adult students	20
		Employed students	20
		Unemployed	20
		Art students	20
		Doctoral students	20
		Alcoholics	20
		Retired people	20
		Control subjects	20
2. Magneberg & Sjöberg (1994)	1985	Control subjects	60
		Problem drinkers	20
3. Magneberg (1994)	1986	Social workers	20
4. Magneberg (1994)	1988	Smokers	44
		Control subjects	40
5. Magneberg (1994)	1989	Drinkers	40

Paper 1 accounts for eight separate studies. The aim of these studies was basically to develop the method of RAS. The target experimental groups were especially interesting categories of people. The groups were: *adult students, employed students, unemployed, art students, doctoral students, alcoholics, retired people* and *control subjects*. They all participated for one week. The high resolution of the results shows that the RAS method gives much more detailed information than *any* method previously used in mapping people's everyday life. The results in terms of differences between the various groups are both numerous and interesting.

Paper 2 accounts for a study on *problem drinkers*. The aim was to study a group of people with a drug addiction. In paper 1 a group of alcoholics participated. However, contrary to expectations, they did not drink anything during the course of the study. Therefore a group of people with a lighter syndrome was gathered. They were explicitly told not to change *any* habits during the study. The RAS method was applied, with the only difference that a revised questionnaire was used. Control group data based on the new questionnaire had been collected in connection with the control group study accounted for in paper 1. From this pool of control subjects, a matched control group was drawn for comparative analysis with the problem drinkers. The main results showed that the problem drinkers were very different when drinking, but indistinguishable from ordinary people when not. Expectations that the RAS method could give a very detailed profile of a drug syndrome were confirmed.

Paper 3 accounts for a study on *social workers*. The aim was to study a group of people with an interesting profession. The choice fell on social workers because, at the time, they were very much in the limelight. The hardship of the profession was believed to lie behind the syndrome of *burnout*. Control subjects were drawn from the same pool as the one mentioned in paper 2. The main results showed that the social workers were quite aware and motivated, but under rather severe strain in their life as a whole. The study confirmed the expectations that the RAS method could give such a detailed profile of a professional group, that it could be used as background material for, e.g., administrative decisions.

Paper 4 accounts for a study on *smokers*. The RAS method was here used in a more applied study. The aim was to study a group of people while using their particular drug, and to study them while trying to quit. The study was limited to cigarette smokers, no other kind of nicotine consumption being permitted. The study differed from earlier studies in the respect that it intended to influence the participants in a foreseeable and desirable way, and the duration of the study was tripled. Control group data were collected in a separate study. The short- and long-term results were comparable with those of other smoking cessation programmes. The high-resolution picture of the smokers may not only help the understanding of the syndrome of smoking, but may also lead to important modifications of intervention programmes. It also gives rise to new angles of research in the field.

Paper 5 accounts for a study on *drinkers*. The RAS method was once again used in an applied study. Here too, the aim was to study a group of people while using their particular drug, and to study them while trying to quit. The study was limited to alcohol misusers, not alcoholics. It was identical to the study in paper 4 in design and intended to influence the participants in a foreseeable and desirable way. The control group data were the same as in the previous study. The short- and long-term results were comparable with those of other drinking cessation programmes. The high-resolution picture of the drinkers may not only help the understanding of the syndrome of drinking, but may also lead to important modifications of intervention programmes. It also gives rise to new angles of research in the field.

METHODOLOGY

Technique and pilot study

The results presented in the papers in this thesis emanate from studies on groups of people with the maximum of 20 participants at a time. The reason for this was two-folded: for statistical reasons a group size of 40 subjects is desirable, but since we planned to equip our subjects with expensive electronic equipment, economic resources limited us to half that number. Instead, to gain the statistically desired number, one would be compelled to perform two consecutive studies on the category of interest. Of course, time dependent changes always brings in a threat to the validity of the results. However, the first series of studies aimed more at developing the methodology, than to reach highly significant differences between the involved categories of people.

The electronics mentioned refers to a technique for reaching people instantaneously wherever they are within the country. As a result of the extension of the FM broadcasting network in Sweden during the last couple of decades, mobile *paging receivers* could be purchased from the beginning of the 1980's. In 1983 they cost as much as mobile telephones of today (1994). However, in contrast to mobile telephones, the communication with paging receivers is one-way. The basic idea is that a paging receiver can be individually reached via a radio signal. The receiver then beeps and displays the digits the sender has pushed on his telephone. Primarily, those digits are supposed to constitute a telephone number. Hence, this technical device makes it possible for a person with the receiver to know *that* he is called upon, and *where* to call for a two-way communication.

A set of 20 paging receivers was purchased in 1983 and a pilot study on five psychology students was conducted. They were equipped with one paging receiver each and a sufficient number of copies of a rather modest questionnaire. All receivers were tuned in to the same radio frequency, which means that they all had the same telephone number. This in turn means that the experimental leader only had to phone the computer at the telecommunication company *once*, when it was time for a call to the *whole* group. After such a call some 30 seconds later the paging receivers of all participants beeped and displayed the number message. This way the subjects in the pilot study were alerted to give their questionnaire response, as soon as possible. The possibility to send numbers was used to send a time-code, which was to be written down on the questionnaire. Although no data from the questionnaires were analyzed, other types of important results appeared. The participants experienced the paging receiver easy to handle, they did not feel disturbed by it, they felt interested and important during all of the five days the study lasted, and receiving and responding to five signals a day was not tiring. Most important, they did not find it difficult or embarrassing to answer the questions in the questionnaire truthfully.

Subjects and sampling procedures

Paper 1. The results presented in the first paper emanate from eight studies with 20 voluntary subjects in each. The studies were carried out between 1983-1985. All participants were given a tax-free fee of 200 SEK. Importance was placed on having an even distribution over gender in all studies.

The first study was conducted on a group of *adult students* attending classes during day-time at an upper secondary school in Göteborg. They were recruited during school-time in their classrooms, after a presentation of the background and purpose of the study.

The second study was conducted on *employed students* who also had small children. They all had work, from full-time to part-time, and they all also attended evening classes at an upper secondary school in Göteborg. They were also recruited during school-time in their classrooms, after a presentation of the background and purpose of the study.

The third study was conducted on a group of young *unemployed* people, with no children. They were recruited via the government agencies for the unemployed and received a letter with information about the study, followed up with a telephone call.

The fourth study was conducted on a group of *art students* attending classes during day-time at an art school in Göteborg. They were recruited during school-time in the classrooms, after a presentation of the background and purpose of the study.

The fifth study was conducted on a group of *doctoral students* at the University of Göteborg. Half of the subjects came from the Faculty of Arts and half from the Faculty of Science. They were recruited via university registers and received a letter with information about the study, followed up with a telephone call.

The sixth study was conducted on a group of *alcoholics*. They were recruited via an alcohol clinic in Göteborg. The staff informed patients about the study and if they were interested, they were shown to a room where the experimental leader of the study took over the information and invited them to participate.

The seventh study was conducted on a group of *retired people*. A random sample was drawn from a population register and 200 retired people received a letter with information about the study. They were then phoned and asked about participation. It was only necessary to get in contact with a smaller portion of the sample to fill all of the places in the study.

The eighth study was conducted on a group of ordinary people to obtain a pool of *control subjects*. A two-stage sampling procedure was employed. First, a random sample of 2 000 persons living in Göteborg and three neighboring municipalities was obtained. From this sample we then obtained a random selection of persons given some restrictions concerning age, gender and income classes. The persons selected then received a letter with information about the study, and one week later a telephone call. Most persons approached were interested and willing to participate and the places in the study were soon filled. In all 80 persons participated.

Paper 2. The results presented in the second paper emanate from a study on a group of 20 *problem drinkers*. The study was carried out 1985.

The objective of the study was to select a group of covert alcoholics, maybe more adequately called problem drinkers or alcohol misusers. The participants were selected from a group of about 60 persons who answered an advertisement in a local daily newspaper. They were promised anonymity and a payment of 200 SEK for their participation. Only men were selected, because not more than 10 percent of those who responded were women. Furthermore, the drinking syndrome is gender dependent, men and women having markedly different abuse patterns. They should therefore be studied separately.

From the pool of control subjects mentioned in paper 1, 20 persons were chosen to match the problem drinkers in respect to gender, age and amount of work.

Paper 3. The results presented in the third paper emanate from a study on a group of 20 *social workers*. The study was carried out 1986.

A group of 100 social workers in the municipality of Göteborg, working with individual and family care in different social welfare offices, was first selected. They were then approached with a letter describing the background and purpose of the study. Finally, they were phoned and asked about participation. Most of them accepted immediately. There were 17 women and 3 men in the final group, a distribution fairly representative of the whole population of social workers in Göteborg.

From the pool of control subjects mentioned in paper 1, 20 persons were chosen to match the social workers with respect to gender, age and amount of work.

Paper 4. The results presented in the fourth paper emanate from two studies with 44 and 40 subjects respectively. The studies were carried out 1988.

The first study was conducted on a group of *smokers*. They were selected from a group of people answering advertisements in two daily newspapers in Göteborg. The advertisements briefly described the study and invited smokers who wanted to quit to contact the investigator for further information.

The advertisements were published on a Sunday. During the following week I received 226 telephone calls and 21 letters. A letter with information material about the study, including a counterfoil and a response envelope, was sent to all of the 247 (100 percent) respondents, out of which 123 were women and 124 were men. The following weeks, another 20-30 applications were received, but they did not get any information material.

Out of the 139 (56 percent) smokers who returned the counterfoil, 71 were women and 68 were men. They all received a second letter containing a questionnaire with relevant background questions, a moral contract that they would perform the study according to the instructions to sign and a response envelope.

Out of the 106 (43 percent) smokers that returned the required forms, 50 were women and 56 were men. Out of those, 50 smokers were selected according to criteria defined when the study was designed. The criteria were about 1) age variation 2) working situation 3) nicotine consumption 4) use or misuse of other drugs

5) physical or mental disorders and 6) ambition to quit smoking. The selected smokers, out of which 24 were women and 26 were men, received a third letter stating a preliminary admission to the study, along with a counterfoil and a response envelope for their acceptance and a question about which part of the study they preferred to participate in.

Out of those finally selected smokers 44 (18 percent) actually participated in the study. The main reason for the quite prolonged selection of participants was the ambition to get a highly motivated group of smokers in the study. Moreover, to be able to create a reference group with which to compare the smokers, i.e., a control group of matched non-smokers, it was important to try to select participants representative of the normal population of people according to important background variables, except of course for smoking.

The second study was conducted on a group of ordinary people to create a pool of *control subjects*. They were selected from a group of people answering advertisements in two daily newspapers in Göteborg. The advertisements briefly described the study and invited people who were interested to contact the investigator for further information. The study was presented as a study of 'Citizens of Göteborg'. This was done to give the participants an identity of their own and not, which in fact was the main reason for the study, an identity of mere control subjects. In contrast to the smokers, they were offered a tax-free fee of 250 SEK for their participation.

Several hundreds of people answered the advertisements during the following weeks. The same procedure as with the smokers was applied in every detail, except for any focusing on smoking. In the final study 40 persons, quite representative for a random, but to some extent stratified, sample of the population of Göteborg, were admitted. The criteria for admission to the study were in appropriate parts the same as the criteria for admission to the study of smokers. Non of the control subjects used nicotine and they drank alcoholic beverages only in very moderate quantities.

Paper 5. The results presented in the fifth paper emanate from a study on a group of 40 heavy *drinkers*. The study was carried out 1989.

The participants were selected from a group of people answering advertisements in daily newspapers in different parts of Sweden. The advertisements briefly described the study and invited people, who thought they drank too much alcohol and who wanted to reduce or quit drinking, to contact the investigator for further information.

The reply frequency to six advertisements in daily newspapers in Göteborg over a couple of weeks, was only 28 percent compared with the study of the smokers, even though there was a local radio broadcasting presenting the study. Therefore a second set of three advertisements was published in two daily newspapers covering the southern parts of Sweden. The reply frequency this time was only 11 percent of that of the study of the smokers. Since the adequate basis of selection still was believed too small, a third set of two advertisements was published in two daily newspapers, covering larger parts of Sweden with some editions. The reply frequency this time

was 34 percent of the study earlier mentioned. Of the respondents so far to the advertisements, only 20 percent were women. In a final attempt to involve more women, two advertisements turning directly towards women were published in two daily newspapers covering most parts of Sweden. The reply frequency this time was 28 percent of the earlier mentioned study. This way the total percentage of women respondents increased to 35 percent. Neither money, nor time permitted any further advertising.

A total of 217 (100 percent) people, 76 women and 141 men, responded to the advertisements. A letter with information material about the study, including a counterfoil and a response envelope, was sent to them all.

Out of the 114 (53 percent) drinkers who returned the counterfoil, 37 were women and 77 were men. They all received a second letter containing a questionnaire with relevant background variables, a moral contract that they would perform the study according to the instructions to sign and a response envelope.

Out of the 93 (43 percent) drinkers that returned the required forms, 30 were women and 63 were men. Out of those, 50 drinkers were selected according to criteria defined when the study was designed. The criteria were about 1) age variation 2) working situation 3) alcohol consumption 4) use or misuse of other drugs 5) physical or mental disorders and 6) ambition to reduce or quit drinking. The selected drinkers, out of which 20 were women and 30 were men, received a third letter stating a preliminary admission to the study, along with a counterfoil and a response envelope for their acceptance and a question about in which part of the study they preferred to participate.

Out of those finally selected drinkers 40 (18 percent) actually participated in the study. The main reasons for the prolonged selection were the same as in the study of the smokers. Additional reasons for the extremely prolonged and expensive selection of participants, were the difficulties to attract the target-group of the study, especially the female ones. As mentioned before, the study did not focus on overtly alcoholic persons, but on covert misusers of alcohol.

The control group was the same as in paper 4. The study of the control subjects was carried out in between the study on the smokers and the study on the drinkers. Special attention was placed on background variables to be equal in all groups.

Data analyses

The data analyses in this thesis employ a variety of statistical methods, from simple summaries to causal factor analysis. The choice and utility of the more complex methods will be discussed.

The data were generated from more than 13 000 questionnaires[1]. In the questionnaires both open questions and rating scales were used. Data based on the open questions are presented as frequency tables throughout the thesis, showing the per-

[1] For a more detailed account see Table 5 on page 33.

centage of different response categories. They were initially coded by one person. He created a cumulative coding schedule while coding, i.e., he included more response categories as they were needed. When more coders were employed, his function became more supervising, introducing them to the coding procedure and training them to use the coding schedule. To facilitate coding, he also systematized the coding schedule. Finally, he continuously checked the coding in a random sample of questionnaires from each coder. The questions from the coders along with the results of the checking, served as a feed-back in developing the coding schedule and uniformity of coding among the coders. During the studies presented in paper 1, a reliability test was performed at one occasion on two coders. The within judge reliability (the proportion of equal judgments) was 0.76 and 0.60 respectively and the between judge reliability was 0.81 and 0.61 respectively.

The rating scales were of two types. In paper 1 a bipolar discrete rating scale with five categories was primarily used, but in a few cases a unipolar scale. In papers 2-3 a bipolar graphic rating scale was exclusively used. In papers 4-5 a bipolar graphic rating scale was primarily used, along with a few bipolar discrete rating scales. The discrete scales were coded from 1-5 and then read into the computer with a keyboard. The graphic scales were measured and read directly into the computer with a digitizer board, giving the different variables values from 1 to 99.

The rating scales provided data that made other kinds of statistical analyses possible than mere descriptive statistics. Correlation statistics were used a number of times. Even more interesting is the possibility to analyze the probability of real differences, both within and between groups. The basic statistical method in those cases was to compare within group variation to between group variation.

When comparing two groups *t*-tests were used. For more complex analyses, the *F*-ratio statistics were used, its simplest form being univariate ANOVA (analysis of variance). Analysis of variance tests the hypothesis that the group means of the dependent variable are equal. However, in ANOVA more than one independent variable is possible. The more complex models of ANOVA test for differences between levels of independent variables and the interactions between them.

Throughout the thesis *t*-tests were fairly frequently used. Also one-way ANOVAs were used and at some occasions two-way ANOVAs. ANOVA with repeated measures was used at a few occasions. Both when employing the *t*-statistics and the *F*-statistics, usually the individual means were first calculated to exclude the individual variability.

In papers 4 and 5, there were four graphic rating scales having between 6 and 9 sub-scales. They were aimed at measuring the internal condition of the respondents. All those rating sub-scales could of course be treated as individual variables in different kinds of analysis. However, since they tend to measure closely related aspects of the human well-being, a factor analysis to reduce this large number of variables to a smaller number of underlying factors is a psychologically meaningful statistical procedure. The total variance of the correlation matrix of the included

variables being the same, the clustering is done by a sufficient number of rotations. The rotation can be either orthogonal, i.e., the new factors are uncorrelated to each other, or oblique (non-orthogonal).

In the papers mentioned, a factor analysis of the well-being variables, from both the experimental groups and the control group, gave a convincing grouping. The initial factor method was Iterated Principal Factor Analysis. The main criterion for retaining a factor was an eigenvalue >1. The final communality estimates were significant for all variables using the Pearson product-moment correlation coefficient on a 1 percent level. Orthogonal rotation was first tested, but the final rotation was made using the oblique Promax method, because it gave the psychologically most meaningful outcome.

In paper 1, finally, a structural analysis was performed using LISREL, a type of factor analysis for testing models of causal flow between variables.

SUMMARIES OF PAPERS

Paper 1: *Action and emotion in everyday life*

The purpose of the study was to develop a methodology for studying behavior in natural settings. Although behavior is a central concept in psychology, naturally occurring behavior has seldom been studied. The reasons for this neglect are both practical and theoretical. From a practical point of view one must find a way of studying behavior in those natural settings with a minimum of interference. From a theoretical point of view one must assess the reliability and validity of the reports from the studied subjects themselves. The method employed in this study is called Random Action Sampling (RAS).

The study was performed on eight categories of subjects in succession: adult students, employed students with small children, unemployed young people without children, art students, doctoral students, sober alcoholics, retired people and control subjects. Each subject in a group was given a paging receiver and 35 copies of a questionnaire. At five random occasions each day for one week all subjects in the whole group could be reached at the same time via the paging receiver wherever they were. They were then to answer all of the questions in a questionnaire as soon as possible.

The questionnaire had 29 questions, some of which had sub-questions (see Appendix A). There were two main types of questions - open questions and rating scales with five categories. The open questions were coded by two persons.

From the beginning 20 subjects were assigned to each of the eight groups, but with 8 drop-outs the remaining number of subjects was 152 in all. The employed students were the worst with 3 drop-outs.

The reply frequencies varied from 82 percent for the unemployed young people up to 98 percent for the sober alcoholics, with a mean value of 91 percent. The

median time-lapse between signal and questionnaire response was 10 minutes and must be considered quite acceptable.

The data generated were abundant and a variety of descriptive and explorative analyses were performed. The background variables, i.e., age, gender, education, number of children and number of hours worked, only accounted for 5-10 percent of the variance of the ratings of the action variables. We concluded from these findings that the samples of subjects could not be entirely misleading, even if they were not strictly representative of the population. Some actions were liked by almost everybody, such as relaxation, enjoying the company of good friends, etc. Market work was not particularly popular in *any* category except among the retired people, where it might serve as a pleasant change in an otherwise very free and well liked life situation.

A few examples of the picture emanating from the whole set of variables are given here. The retired people acted on their own initiative, felt more free and were in a good mood, were little stressed and felt little regret. The unemployed, on the other hand, saw goals as distant, were in a bad mood and perceived little environmental influence on their actions. Adult students saw their main acts as morally justified but they also felt restrained in performing them. Employed students were especially characterized by lack of own initiative in non-main acts and by short acts of that kind. Art students saw the main act as something dependent on their own initiative and difficult. They had a high stress level in non-main acts, a low mood and distant goals. They tended to analyze their actions in many steps. Doctoral students felt they could influence their main actions, but were stressed in non-main acts and in a low mood. Sober alcoholics, finally, perceived little stress in their main act and high value in non-main acts, which they liked well.

The results of the study support our approach of studying the stream of behaviors as it occurs. Retrospective reporting, like diary reports, assume the existence of a correct memory of actions. However, many studies show that the memory of an action tends to change as time goes by, hence retrospective reports should differ systematically from time-sampling. Few would dispute the fact that a 'fresh action' is remembered in more detail than even something that happened a couple of hours ago. Part of the strength in the method of RAS is that it tries to minimize the time elapsed from sampled action to report.

Paper 2: *A study of the everyday behavior of problem drinkers*

The purpose of the study was to investigate the actions carried out by a special type of alcohol misusers in everyday life and to compare them with those of a control group, and further to investigate how alcohol consumption was experienced by these misusers in their natural surroundings.

The same methodology was used as in the study presented in paper 1. The subjects, who were all males, were instructed to carry on with everyday life as normal, which especially meant that we did not want them to change their drinking

habits. They were promised anonymity, a follow-up interview and a payment of 200 SEK for their participation in the study.

The questionnaire was revised to some extent. The new questionnaire had 32 questions, some of which had sub-questions (see Appendix B). There were still two main types of questions - open questions and rating scales. The new rating scale was of a bipolar graphic type, which could easily be read directly into a computer with a digitizer board.

Two people did not carry out the study in the required way and were therefore excluded from the data analyses. Control subjects matching the problem drinkers in most background variables were drawn from the pool of randomly selected control subjects mentioned in paper 1. The reply frequency was 89 percent for the problem drinkers and 93 percent for the controls. The median time-lapse between signal and questionnaire response was 13 minutes.

The results of the study showed that there were two striking cyclic aspects of the drinking time pattern. First, drinking was reduced to a minimum in the morning and increased during the day. Second, drinking reached its maximum on Friday and decreased up to Sunday. It then increased substantially on Monday and decreased up to Thursday[2].

The problem drinkers worked less than the controls and were instead more engaged in activities such as recreation, relaxation and rest. They spent more time at home and more time with acquaintances than the controls did.

The effects of alcohol were rather clear-cut. The drinkers reported some pleasant body feelings and relaxation, along with experiences of being more imaginative and impulsive. But they also showed signs of bad conscience when drinking and their assessment of the actions performed were less positive. Hence, drinking seemed to be an ambivalent experience for them. Perhaps the reason why problem drinkers frequently denounce any positive effects of alcohol when sober has to do with this ambivalence.

If a division is made between external variables, i.e. aspects of the specific action, and internal variables, i.e., aspects of a person's inner experiences of himself, the results become rather striking. The controls obviously experienced an overall increase in life-quality when drinking. The problem drinkers, on the other hand, experienced an increased quality in respect to the internally oriented experiences, but at the same time a decreased quality in respect to the externally oriented actions.

Interestingly enough the results of the study show that the problem drinkers *did not* differ very much from control subjects when sober. If there are consistent personality traits characteristic of problem drinkers, they hence do not seem to affect acts as conceived here. Since personality tests have consistently failed in discriminating problem drinkers from other groups, we conclude that problem drinkers simply differ from normal people by *drinking more*, but not in any other consistent way. At least not as far as we could discover with our method. The search for distinct

[2] This weekly drinking pattern was confirmed by a later study.

personally traits of different kinds of alcohol users must clearly consider the importance of measuring personality under different conditions, to achieve better validity.

Paper 3: *A study of the everyday behavior of social workers*

The purpose of the study was to investigate the actions carried out by a group of social workers in their everyday life, both during working hours and during leisure time, and to compare them with those of a control group. This was done in order to see whether the general impression of the professional difficulties of this group of workers could be verified or not.

The same methodology was used as in the study presented in paper 2. Out of the subjects, 17 were women and 3 were men, a distribution fairly representative for the whole population of social workers in Göteborg at that time.

The same questionnaire as in the previous study was used. One woman was excluded from the data analyses because of exceptional events; she gave birth to a child. Control subjects matching the social workers in most background variables were drawn from the study of 60 randomly selected control subjects earlier mentioned. The reply frequency was 95 percent for the social workers and 91 percent for the control subjects. The median time-lapse between signal and questionnaire response was 24 minutes. This is much longer than any other group studied. Since it is not a result of neglect, but an indicator of a stressful working situation, the validity of data is not threatened.

The results indicate that social workers spent more time at work and less time at home than the controls did. On the whole, the social workers lived a more unpleasant life than the control subjects. Not even during leisure time did they experience life as enjoyable as the control subjects during working hours.

The social workers in the study appeared to be quite aware and motivated, but under considerable strain. Working full-time in a profession requiring a college education, and at the same time having small children, might be enough to explain this strain. But after having ruled out different possible explanatory factors, the most likely explanation of this strain is the working situation of the social workers. The rapid flow of demanding clients and the insufficient time and means for meeting these demands, is usually said to put the social worker into a very frustrating conflict. According to other studies as well, this dilemma affects the whole everyday experience of life, workday as well as holiday, resulting in somatic, psychiatric and private disturbances.

Paper 4: *The effect of electronic surveillance on nicotine misuse and everyday behavior*

One purpose of the study was to help a group of habitual smokers to quit smoking. Another purpose was to study how nicotine misusers differ from matched non-smoking people, and to obtain a psychological profile of them before and during their attempts to quit. The study used the same technique and methodology as the

studies presented in the previous papers, for conveniently reaching the subjects at any time, anywhere and to sample their everyday behavior.

The participants in the study were 22 female and 22 male smokers. They participated for three consecutive weeks and received three signals per day. The first week they were supposed to continue to smoke as usual, but from the second week on they were to stop completely. To obtain control subjects a study of 40 normal, non-smoking people was conducted, half being females and half being males. They participated for one week and received five signals per day. They also received a payment of 250 SEK for their participation in the study. There were four drop-outs in the study of the smokers, two women and two men. In the study of the control subjects there were two drop-outs, one woman and one man. They were replaced by two matched control subjects from the pool of control subjects for the studies presented in papers 2-3.

The questionnaire used was the same as in the studies presented in papers 2-3, with the addition of seven questions (see Appendix B & B1). The objective of these new questions on the last page of the questionnaire was to ask the smokers smoking-related questions. To balance these extra questions for the smokers, the control subjects were instead asked other types of questions about their life.

The reply frequencies were 88 percent for the smokers and 95 percent for the controls. The median time-lapse between signal and questionnaire response was 13 minutes for the smokers and 14 minutes for the controls.

The results of the study in terms of reduced and terminated smoking must be considered satisfactory. One month after quitting-day (Q-day) 35 percent did not smoke at all, while those who still smoked only smoked around 34 percent of their original consumption. One year after Q-day 20 percent still did not smoke at all, while those who still smoked did so around 46 percent of their original consumption. Six years after Q-day finally, 25 percent of those who could be reached did not smoke at all, while the consumption of those who smoked was 70 percent of the original one.

The results in terms of psychological profiles of the smokers had a very high resolution. The smokers felt very bad when they stopped smoking. A regression analysis showed that at least 4-5 weeks were required for the smokers to regain their lost quality of life. Not surprising, the smokers felt worse than the controls, even during the week when they were allowed to smoke. The main difference occurred in body needs, the smokers depriving themselves of food, drink, sleep and warmth. The differences in body status and basic mood were also highly significant.

Frequency analyses of different actions performed showed that the smokers, compared with the controls, only were engaged in work-actions in 78 percent of their formal working-time. Other analyses showed that the smokers were smoking 22 percent of their time. This corresponds approximately to 3½ hours during a 16 hours period. Half of this time must have occurred during working hours. Even though smoking can occur while doing other things, it is hard to believe that the smokers were as efficient performing their work as non-smokers.

The post-study interviews shed some light on the reasons for smoking. Once the habit is established it seems to be a reason of its own. Further, smoking appears to be a hedonistic way of functioning - when one seeks a little relaxation a cigarette comes handy. But the smokers also claimed a stimulating reason.

In the study presented here, a proportion of the participants actually succeeded to quit completely. The consumption of cigarettes of the remainders then began to form a distribution, where the mean consumption slowly, as years went by, was drawn to the original mean consumption prior to the cessation programme. Hence, the long-term results for a cessation programme can be adequately measured in how *large* a proportion of the participants that do not smoke from time to time, and with what *speed* the mean consumption of the rest goes back to 'normal'. To evaluate the net effect of the study, the spontaneous rate to quit or reduce smoking must be considered.

Paper 5: *The effect of electronic surveillance on alcohol misuse and everyday behavior*

One purpose of the study was to help a group of heavy drinkers to quit or reduce drinking. Another purpose was to study how alcohol misusers differ from matched non-drinking people, and to obtain a psychological profile of them before and during their attempts to control their drinking. The study used the same technique and methodology as the study of the smokers.

The participants in the study were 16 female and 24 male drinkers. They participated for three consecutive weeks and received three signals per day. The first week they were supposed to continue to drink as usual, but from the second week on they were to stop completely. The same control group as in the study of the smokers was used. There were five drop-outs among the drinkers, one woman and four men. Consequently, only 35 matched control subjects were used from the pool of control subjects.

The questionnaire used was the same as in the studies presented in paper 4, but the seven questions on the last page were changed to fit the drinkers (see Appendix B & B2). The objective of these last questions was to ask the drinkers drinking-related questions.

The reply frequencies were 85 percent for the drinkers and 95 percent for the controls. The median time elapsed between signal and questionnaire response was 15 minutes for the drinkers and 13 minutes for the controls.

The results of the study in terms of reduced and terminated drinking must be considered satisfactory. One month after quitting-day (Q-day) 43 percent of the drinkers practically did not drink at all, while those who were still drinking only drank around 33 percent of their original consumption. One year after Q-day 57 percent practically did not drink at all, while those who were still drinking only drank around 40 percent of their original consumption. Five years after Q-day finally, 27 percent of those who could be reached practically did not drink at all, while the

consumption of those who drank was 48 percent of the original one. It seems as if the female drinkers managed to get control over their alcohol consumption a little better than the male drinkers.

The results in terms of psychological profiles of the drinkers had a very high resolution. The changes in life experience during the weeks when they were not to drink were dramatic. Quality of life began to improve almost immediately. Major shifts occurred in body needs and basic mood. The first week drinking mainly took place during time off from work. However, both during working-hours and time off, the drinkers experienced themselves worse regarding body status and basic mood compared with the non-drinkers. When compared with themselves, the stress variable was the only one that indicated a change for the better when drinking.

Frequency analyses of different actions performed showed that the drinkers, compared to the controls, only were engaged in work-actions in 68 percent of their working-time. Even if the drinkers, due to unemployment, only worked 88 percent of what the controls did, they did not spend as much time at work as they said or should have done. Instead they were home engaged in pleasure, recreation, care and sleep, etc. They obviously preferred a hedonistic way of life.

The post-study interviews did not really give any systematic answers to *why* they were drinking. However, they quite clearly indicated that the alcohol misuser lives in a special niche and is not to be confused with the alcohol abuser, i.e., the alcoholic. Data show a very distinct day, week and year drinking time pattern for the misuser. It can most accurately be described as *cyclic*, while the drinking time pattern of an abuser is known to be periodic.

In the study presented, the long-term results seemed to be that most female drinkers became ordinary users of alcohol and this was true for many male drinkers as well. Even if the male drinkers drank substantially less after five years than prior to the study, many of them still drank too much. To evaluate the net effect of the study, the spontaneous rate to reduce or quit drinking must be considered.

COMPREHENSIVE ANALYSES

Focus will first be placed on the methodological development throughout the studies in the thesis, from the pilot study to the applied studies of misusers. The perspective will be from the viewpoint of the participants. Thereafter, focus will be placed on some interesting topics related to the overall results of the studies, like gender differences and measurements of internal states. A comparison of the two kinds of rating scales used will be made, and finally the reliability, validity and rationality of results will be discussed in general.

Methodological development

To survey the methodological development that has taken place during the series of studies, the major structures of the studies will be compared. The structure can be said to be built up by three entities: the *experimental settings,* the *technique used* and the *means of responding.*

Experimental settings. With the experimental settings is meant all those distinct parts, that for the participants are the features of the study. Primarily, the experimental settings consist of features emanating from the experimental design, and on top of those all the features necessary to perform the study in the required way in practice.

The basic experimental design was to measure a group of people at random intervals during a predetermined period of time. In the studies presented in papers 1-3, no manipulation was introduced, which means that the only thing studied was the spontaneous on-going activities of the participants. In papers 4-5 the design was to study the experimental group under normal conditions, and then to study it after an intervention in a predetermined way had been induced.

The definitive experimental design established *what groups* were to be studied, for *how long* and *how often* they were going to be measured. First, decisions about how to generate results, i.e., comparisons within groups, between experimental groups or between experimental groups and control groups, had to be carried out. All those types of analyses were considered important and therefore control group studies were also performed, generating one pool of control data for the studies presented in papers 1-3, and another pool for the studies presented in papers 4-5. The most crucial aspect of choosing participants in a study, be it an experimental group or a control group, was that the participants were recruited in *the same way.* Second, decisions about during how long a period and how many signals per day to transmit had to be taken. A time-pattern of five signals per day for one week, as in the studies presented in papers 1-3, or a time-pattern of three signals a day for three weeks, as in the studies presented in papers 4-5, has proved to be no problem. It all seems to depend on if the participants find the intervals reasonable in light of the objective of the study. Furthermore, a limitation for transmitting times, from 8:00 a.m. to 10:00 p.m. seemed reasonable, with the right for the participants to have the paging receiver turned off while sleeping during night, even if time limitations were exceeded.

Features linked to performing a study practically have undergone a sort of evolutionary development. When it comes to recruiting participants, it should be needless to say that all participation has been *voluntarily.* To perform a study on indifferent or unwilling subjects would meet great difficulties. Further, it has facilitated the studies to make the participants perceive themselves as a *group,* which has been easily enforced by letting them all meet for an introduction of the study, when written instructions, paging receivers and questionnaires were handed over. Moreover, a *personal relationship* between the investigator and each and every par-

ticipant in the group under study has proved to be essential. There is a believed high correlation between drop-outs and participants that for various reasons had low motivation, were not very much part of the group or had a superficial relationship with the investigator.

Technique used. The same model of paging receiver was used throughout all studies. As a matter of fact, the same physical entities were used over a time-period of six years, with no losses. They were easy to handle, presumed instructions were followed. The main concern was to charge to battery every night. Usually, there were a couple of paging-failures in every study, mainly due to worn out batteries. They were then quickly replaced.

Lost reports because of technical problems varied a little between studies, but only around a very low mean value of about 3 percent. Out of those, maybe only 10 percent were due to the actual fact that the pager was unable to receive the transmitted signal, because of radio-shadow.

Means of responding. In the studies belonging to paper 1, an initial type of questionnaire was used. In the studies belonging to papers 2-5 a second type of questionnaire was used. While the open questions were practically the same in both questionnaires, the rating scales in the first questionnaire were discrete, while those in the second questionnaire were graphic.

Both questionnaires had bipolar scales, with one important exception: question no. 5 in the first questionnaire, measuring some emotional dimensions, was unipolar. Compared with question no. 4, measuring some other internal dimensions, the unipolar construction of question no. 5 was unfortunate. Response patterns showed that subjects did not pay the question enough attention. Since this was not the case with question no. 4, a revision and an extension of the two questions was made, resulting in the questions no. 10-13 in the second questionnaire. This proved to be a fruitful transformation, giving the basis for a factor analysis in search of internal dimensions.

The introduction of the graphic rating scale had two motives. One was that the work with transferring a filled in questionnaire to a data-file would be facilitated, since it would be possible to read data directly into the computer with a digitizer board without previous coding. Another was the hope to eliminate response patterns, since a tendency to cling to the same category of the discrete rating scale was noticeable.

In papers 4-5 a one-year follow-up was conducted with a total of five questionnaires, mailed with a mean interval of about 12 weeks. Thereafter a several-year follow-up, five and six years respectively, was conducted with one questionnaire to evaluate the long-term net results of the studies.

The applied studies

The studies in focus here are presented in papers 4-5. They are named applied because the purpose of those studies was to manipulate the participants in a prede-

termined way at a predetermined time. Of course the participants were aware of this feature of the study. The general methodology used was the same as had been developed in earlier studies presented in papers 1-3.

Self statements. One important aspect of a person as an agent in life is his or her *internal* experiences, i.e., a person's intrinsic evaluations of him/herself. Therefore, the evolution day by day, during the three weeks phase I of the study lasted, on the mental levels presented in papers 4-5, is most interesting. During the first week, when smokers were allowed to continue smoking and drinkers were allowed to continue drinking, *t*-tests of the index variables showed no significant differences between the two groups; there is not even a trend. If, on the other hand, new *t*-tests are run on the original 29 somatic, emotional, cognitive and performance variables, four come out with an acceptable level of significance ($p<0.05$): the smokers were more *hungry*, more *cold* and *surprised* than the drinkers, who in turn were more *unstressed* than the smokers.

It is not unknown that smokers consciously or unconsciously suppress hunger by smoking. Alcohol in moderate quantities, on the other hand, is known to have a stimulating effect on the appetite. However, in the quantities we are dealing with here, the alcohol consumed obviously had a somewhat reducing effect on appetite. Another rather well known fact is that smokers generally feel more cold than non-smokers, the substances in cigarette smoke causing vascular contraction. Alcohol has the opposite effect, which makes the drinkers feel warmer. But that the smokers in the study appeared to live their lives in a state of surprise, is just surprising. The study of the drinkers, on the other hand, showed that they seemed to be less surprised than people in general. Finally, it was the drinkers that diverged when it came to the experience of stress. They were much more unstressed than both the smokers and the control subjects.

The next two weeks the two groups differed drastically. When compared with the controls, the smokers reacted primarily with changes in *body status*, *basic mood*, *cognitions* and *performance*, while the drinkers primarily reacted with changes in *body needs*, *basic mood* and *feelings*. When compared with each other, the drinkers systematically experienced themselves better than the smokers. Significantly, they differed in *body status* ($p<0.05$), *basic mood* and *performance* ($p<0.01$).

To show the pattern and magnitude of the differences between smokers and drinkers over all three weeks of phase I, the index variable *basic mood* is chosen as a representative indicator. The results are presented in Figure 1. Even though the control subjects only participated for one week, control group data are repeated the second and third week, to create a reference.

The first week, the basic mood of the controls was significantly better than the mood of both the smokers and the drinkers. The weekly cyclic pattern of the controls corresponds fairly well with common sense notions. Most people seem to like Wednesday a little better than the other workdays. The German word 'Mittwoch', which means 'in the middle of the week', is a very expressive way of naming that

particular day. People's mood being low on Monday and reaching its peak during week-ends surprises no one.

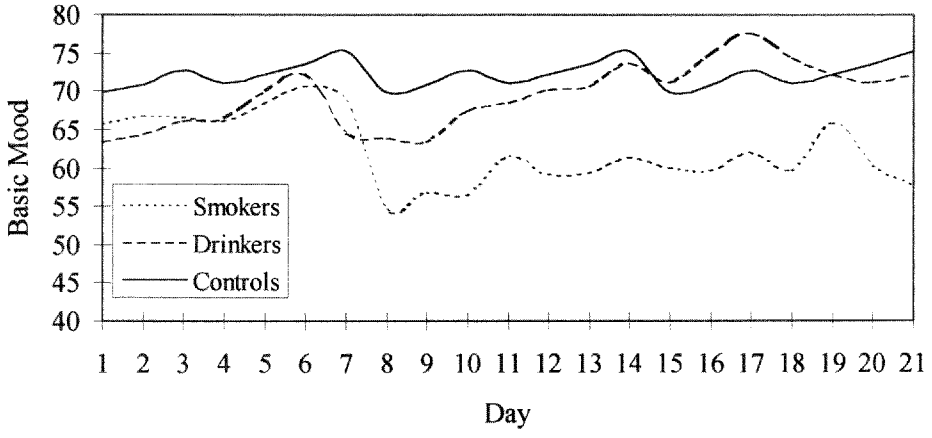

Figure 1. The evolution day by day for the index variable *basic mood.*

As can be seen in the figure, the basic mood of the smokers and the drinkers during the week with continued misuse hardly differed at all. But beginning with the second week drastic differences occurred. The mood of the drinkers was only moderately low for a couple of days, but it is not possible to discriminate this change from a weekly cyclic pattern. Thereafter their basic mood gradually improved day by day. The third week they even exceeded the controls, with an extraordinary peak in the middle of the week. The smokers, on the other hand, took a deep dive into 'melancholy'. They then gradually improved in mood day by day, but far from as quickly as the drinkers. The general impression, also from the post-study interviews, is that the smokers had a very rough time while quitting, in contrast to the drinkers who did not suffer any overt abstinence symptoms.

Among the more interesting findings are the internal experiences of the dimensions *surprised/confirmed expectations* and *very stressed/plenty of time*, the former trying to measure the experience of *novelty* in a situation, while the latter is aimed at measuring the experience of *tempo* of events. While the smokers and the drinkers also differed with respect to being hungry and chilly, those differences can be attributed to the short-term effects of the different drugs in use. However, the differences in experiencing novelty and tempo are more likely either to by caused by long-term effects of the drugs or to be indicators of systematic differences in personality traits between the two categories of addicts.

Starting with the novelty aspect, it was mentioned during the post-study interviews that the opposites perhaps should have been *surprised/bored*, and maybe that is the way most subjects actually perceived the question. If we go along with that

interpretation, the first week the smokers were more surprised than the controls and the drinkers were bored ($p<0.1$). The difference between the smokers and the controls was larger than the difference between the drinkers and the controls. After they stopped smoking and drinking respectively, the drinkers became more bored as the days went by, while the smokers became more surprised, the controls lying almost in between. If this should be interpreted as a reflection of abstinence or an indicator of differences in personality traits is at this point not possible to tell.

Concerning the tempo aspect, all three groups had a very distinct weakly cyclic temporal-pattern, Monday being the most and Sunday being the least stressed day. During all three weeks, the drinkers were much more unstressed than the smokers, who did not differ from the controls when it came to the average magnitude of experienced stress. The way they differed was that the amplitude in the variations were much smaller. The third week the drinkers seemed almost to lose their weekly temporal-pattern, experiencing very little stress at all. This temporal dimension is significant solely to the response of the drinkers. Why the drinkers seemed to be so unstressed in their ordinary life, and why they became even more unstressed when they stopped drinking, is somewhat of a puzzle. It does not fit the general picture of an alcohol misuser.

Action attributes. The other important aspect of a person as an agent in life is his or her *external* experiences, i.e., a person's extrinsic evaluations of the ongoing activity in the surrounding world. The question is if smokers and drinkers differ in this aspect compared with each other and normal people. To find this out, one-way ANOVAs were computed on group data from the first week of phase I, using the individual means for each subject. The results are shown in Table 2.

Table 2
Means of Rating Variables Showing Action Attributes During the First Week for the Smokers, Drinkers and Controls

Variable	Smokers (N=40)	Drinkers (N=35)	Controls (N=40)	p
Thought-out decision	65.2 *	74.5	70.2	0.009
Estimated morality	77.0 *	78.0 *	85.6	0.031
Own initiative	72.8 ~	81.2 *	71.6	0.000
Duration of action	2.21 ~	2.52 *	2.10	0.000
Common	65.3 ~	72.8 *	67.8	0.017
Plenty of time (unstressed)	63.3 ~	70.6 *	63.8	0.027
Steered surroundings	45.7 ~	51.6 *	46.7	0.034

* Significantly different from control group data ($p<0.05$).
~ Close to control group data.

The most striking thing is how little the smokers differed from normal people and how much more the drinkers differed, when considered as agents in the surrounding

world. The two groups had only *one* action attribute in common: the low estimation of the morality of the action. Since the estimation of morality made by the control group in these studies was in line with the estimation the control group made in the study presented in paper 2, there is beyond all doubts that being a drug addict, in the sense discussed here, lowers one's moral apprehension in general.

Except for the moral estimation, and except for not having as well thought-out a decision as the controls, the smokers did not differ from people in general regarding the action attributes measured in these studies. Except for the moral estimation, the drinkers, on the other hand, differed substantially from people in general. The initiative for their actions lay mostly in themselves and they usually acted upon a well thought-out decision. Further, they were engaged in common actions with long duration. Finally, they thought they were able to steer the surrounding world to a great extent and they certainly believed they did not have to rush things. To summon up, they appeared to be more of agents in their own lives than both the smokers and the controls, doing things of their own choice in their own tempo.

The conclusion must be that alcohol is a drug with more profound effects than nicotine on everyday life actions. It is not strange that drinkers appreciate this state of being, because who would not mind being more unstressed. The adequate question that emerges is of course what *price* drinkers pay? In the study presented in paper 2, drinkers rated why they wanted to reduce or quit. The main motives were for *economic* reasons, *health* reasons came in second place and *psycho-social* reasons in third place. The drinkers certainly pay a price, but it is difficult to measure with the method of random action sampling.

Another interesting aspect is how the smokers and the drinkers related to their different misuse problems. When answering a questionnaire, they also answered a couple of drug-related questions. The questions are accounted for as variables in *t*-tests and the results are presented in Table 3. The individual means for each subject was first calculated.

Table 3
Means of Rating Variables Showing Drug-Related Attitudes During the First Week for the Smokers and the Drinkers

Variable	Drinkers (N=35)	Smokers (N=40)	p
Succeed to quit	3.27	3.75	0.036
Desire to use one's drug	2.91	3.51	0.006
Abstinence symptoms	2.17	2.39	0.378
External relationship	3.68	4.08	0.046
Self-appreciation	3.21	3.85	0.005

Four out of five variables yielded an acceptable level of significance. During the week when they were allowed to continue with their drug, the smokers were more optimistic about the possibility to succeed to quit, than were the drinkers. As it later turned out, they really did not have any justifications for this.

When it came to the strength of the desire to use one's drug, the desire to smoke was significantly higher than the desire to drink. This probably agrees with the general notion people have about smokers and drinkers, smoking being more urgent than drinking. It could be compared with the common opinion, that it is more difficult to be without water than food, the smokers in this metaphor for once being the thirsty ones.

No group suffered from any severe abstinence symptoms, but of course it is only natural that the smokers, with their urgency syndrome, should experience some more abstinence symptoms. However, this difference was not significant.

Not surprisingly, the smokers had a more relaxed relationship with people around them. Smokers usually perceive themselves as more sociable than non-smokers. Smoking seems to have almost the opposite effect on smokers, than the withdrawal symptom among drinkers.

Finally, the self-appreciation of the smokers was significantly higher than that of the drinkers. The fact that alcohol is considered as a more heavy drug than nicotine, may put some extra guilt feelings on the shoulders of the drinkers. The drinkers actually felt more guilty than the smokers, but this difference was not quite significant. The only thing that seems to bother smokers, is people who are bothered by their smoking.

Long-term results. The long-term results in terms of reduced and terminated misuse were in favor of the alcohol misusers. Five years after the study, most of them had turned into ordinary users, and those who had not had reduced their consumption substantially. The smokers, on the other hand, divided themselves into two categories: one fourth that did not smoke at all, and the rest who smoked a little less than prior to the study. It was possible to reach 74 percent of the drinkers and 80 percent of the smokers in the follow-up study.

Conclusions. Nicotine misusers were easier to recruit and handle than the alcohol misusers. They were more conscientious in performing the study. However, they had a terrible time while trying to quit and the long-term results were not that good. The alcohol misusers, on the other hand, sort of immediately started to float up to the surface. The long-term results were much more satisfying than the results of the smokers.

Gender differences

What could be more tempting to analyze with this kind of vast data set than gender differences? Is it possible to detect if men and women differ in respect to internal and external conditions? Although women usually report more negative affect, they also seem to experience greater joys than men (Braun, 1977; Cameron, 1975).

In all, 98 control subjects have participated in different studies using the revised questionnaire, half from each gender. The results of *t*-tests are shown in Table 4. The individual means for each subject was first calculated.

Surprisingly, the only variable that came out with an acceptable level of significance was the possibility to leave a situation, the men stating that they were much more free to leave than the women. The women, on the other hand, found it easier to perform an action and expected a positive outcome of it to a higher extent than the men. These latter findings correspond with the results from the studies in paper 1. Finally, the women took more own initiative to their actions than did the men.

Table 4
Means of Rating Variables for Female and Male Control Subjects[a]

Variable	Females (*N*=49)	Males (*N*=49)	*p*
Free to leave	64.2	71.7	0.004
Ease to perform	82.1	78.6	0.064
Own initiative	74.7	70.7	0.081
Positive result	80.6	77.4	0.094

[a] For a more detailed account see Table 5 at page 33.

There were some trends in the results. Compared with the men, the women tended to feel more friendly, glad, secure and controlled. Their actions were important to them and their regrets were small. Compared with the women, on the other hand, the men tended to perceive themselves as more imaginative and alert. They also believed they could influence the situation they were in more than the women.

On the whole one must conclude from these results, that significant gender differences are much more difficult to establish than differences between, e.g., smokers, drinkers and ordinary people. Gender differences of course exist, but are probably greatly confounded with other background variables such as age, income, socio-economic class, employment, education, marriage and family, to mention a few important examples. Those other variables must be held under control when comparing gender, because it is possible that the magnitude and sign of differences will change with altered background settings.

Measurements of internal states

In papers 4-5 of this thesis a factor analysis of the questions no. 10-13 is presented. The aim of those questions, which in turn had 6-9 sub-questions, was to measure the *internal states* of the subjects. With this is meant something else and more than mere *mood*; it stretches from very somatic dimensions like experiencing hunger or

thirst, over emotional dimensions like feeling happy or angry, across cognitive dimensions like fantasizing or planning, up to performance dimensions like being skillful or efficient. This was the theoretical idea behind the four questions in the revised questionnaire. It is of course inevitable that there is a relationship between life events and mood, and this has also been documented by Stone and Neale (1984), among others.

A factor analysis of those questions did not group the variables in this way. However, there was a demarcation line between questions 10-11 and 12-13. While four factors came out of the former and two factors out of the latter, the distinction made between somatic and emotional dimensions on one side and cognitive and performance dimensions on the other side appeared to hold. Two variables in question 13, *unsociable/sociable* and *stressed/plenty of time*, tended to come out as factors of their own during different analyses, and were therefore excluded from the factor analysis and treated as separate variables in other kinds of analyses. Summarizing, the following six internal state factors were found:

1. Body needs
2. Body status
3. Basic mood
4. Feelings
5. Cognitions
6. Performance

These factors seem psychologically reasonable as expressions of internal states and they worked well as index variables in different types of analyses.

Much research has been devoted to studies aimed at finding a few underlying factors to explain the dimensions of *mood*. An early model postulated four bipolar dimensions:

1. Activation - deactivation
2. Positive - negative social orientation
3. Control - lack of control
4. Positive - negative appraisal

Other studies have been employed to replicate or broaden those results. In two studies Sjöberg, Svensson & Persson (1979) examined the polarity and dimensionality of mood using a symmetric response scale and applying a simplex model to each mood continuum. Six factors were obtained in both studies. The following six bipolar basic mood factors were found:

1. Pleasantness
2. Activation
3. Tension
4. Social orientation
5. Social interaction motive
6. Control

There is no obvious correspondence between these factors and the ones extracted in the present thesis. This is not easily explained, but a few things are worth pointing

out. The studies just accounted for were conducted in situations where people were asked to rate a *vast* number of questions *one* time. Furthermore, the situation they were going to evaluate was the one in which they were when filling in the questionnaire. The studies accounted for in the present thesis, on the other hand, were conducted in people's ordinary lives. They were responding to a realistic life-situation over and over again. This is bound to influence response patterns in favor of being more accurate. Finally, only about half of the dimensions between the two types of studies overlapped.

To have reliable scales for measuring mood is important. However, the interfaces to other internal dimensions have to be explored as well. A revision and an elaboration of the scales used in the revised questionnaire could be the next step.

Discrete versus graphic rating scale

The most important motive for changing from a discrete rating scale to a graphic rating scale was the belief that it would loosen up response patterns among the subjects in the studies. There was a noticeable tendency to use the same level on the discrete scale question after question when answering a questionnaire. In other words, increased variation in the answers was desired, in order to make more variable differences significant in various types of analyses.

With the introduction of the graphic scale, small deviations in the response from question to question were now not only possible - on the contrary it would be almost impossible to keep answering the same way. Beside the convenience in transferring the values from the graphic scale into a data file, the question thus was if the results from different types of analyses would benefit from this type of substitution. Analyses of response patterns from both scales should be able to answer that question to some extent.

The two different types of questionnaires had twenty questions in common. The response patterns to those questions were analyzed and the results are presented in three figures: Figure 2 shows the response pattern to the discrete scale, over all questionnaires from the studies presented in paper 1; Figure 3a shows the response pattern for the graphic scale, over all questionnaires from the studies presented in papers 4-5; Figure 3b shows the graphic scale transformed into discrete levels, to be easily comparable with Figure 2.

Already Figure 2 shows that we are not dealing with a normal distribution. The mean value for the distribution is 3.80 and the standard deviation 1.16.

The shape of the graph in Figure 2 also has some unexpected features. There is a small tendency to use the "extremely bad" category, a distinct tendency to rate around the "neutral" category and a strong tendency to use the "extremely good" category. As a matter of fact, around 75 percent of all ratings lie on the *good* side of the scale (>50), and in all 50 percent of the ratings lie in the upper quartile (>75). The mean is 68.1 and the standard deviation 25.9.

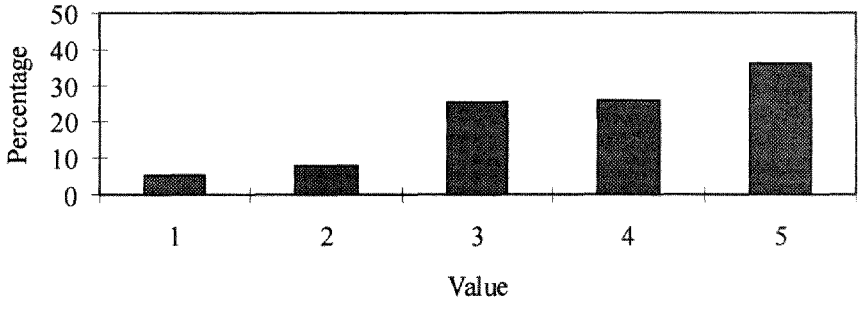

Figure 2. Response pattern for the discrete rating scale ($N = 88\,401$).

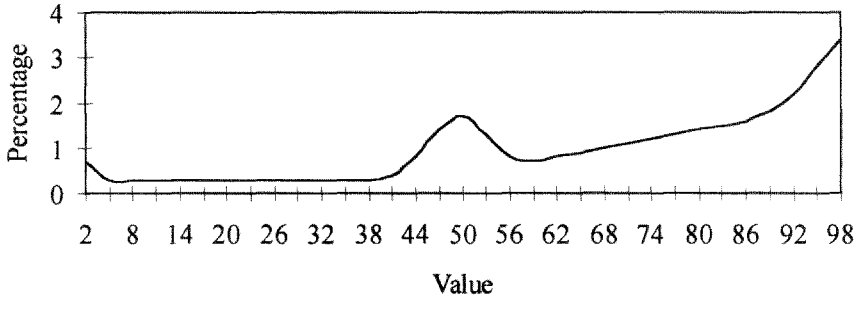

Figure 3a. Response pattern for the graphic rating scale using a 3-point mean ($N = 104\,753$).

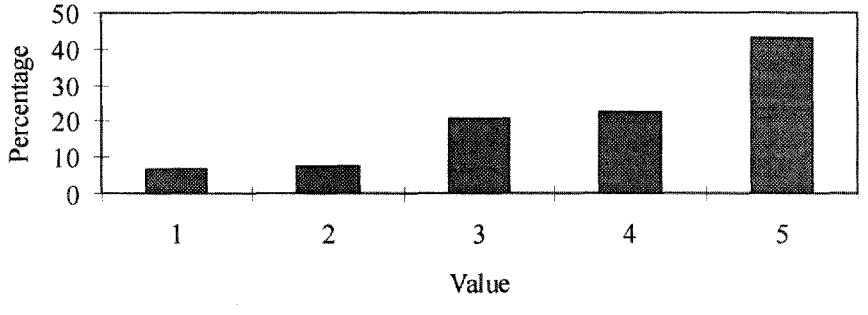

Figure 3b. Response pattern for the graphic rating scale transformed into a discrete scale.

The transformed scale in Figure 3b shows a similar pattern to the one presented in Figure 2. The mean value for this distribution is 3.88 and the standard deviation 1.23. The conclusion must be that response patterns are fairly stable, whether one uses a discrete or a graphic rating scale. However, if the transformed discrete variable values are used instead of the original ones from the graphic scale, and the

same analyses comparing experimental groups and control groups are made all over again, the *p*-value is influenced in an unfavorable direction. This in turn is due to loss of variation.

An important question that arises, which could jeopardize the results of all studies that used the graphic rating scale, is what kind of consequences the somewhat strange appearance of the graphic scale distribution has on different kinds of analyses. The main assumptions behind those analyses are that the variables involved are normally distributed. However, the response pattern to the graphic scale shows that people in general perceived the scale as tri-modal, with the categories *bad*, *medium* and *good* in that ranked order. The logical thing therefore is to run some analyses over again using non-parametric tests. These tests make minimal assumptions about the underlying distribution of the data and are used when parametric procedures are not entirely appropriate. Generally, distribution-free tests are less powerful than their parametric counterparts and this tendency could also be noticed. Despite some small deviations, the variables that became significant and the *p*-values for these significances *did not* change the result patterns from corresponding parametric analyses.

To estimate the discriminatory power of the scales, the mean scale values for the twenty questions in common are first plotted. The means were first calculated for each individual and then over all individuals. The results are shown in Figure 4 along with the regression line. As can be seen, agreement with a linear regression must be considered extremely good with a very high correlation (r = .98, p<0.001). From this point of view, the presumed clustered response pattern to the discrete rating scale is not confirmed.

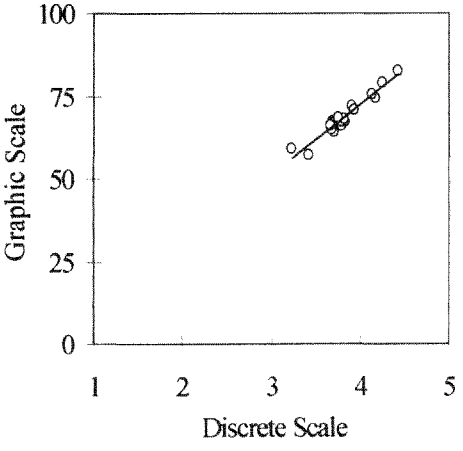

Figure 4. Mean scale values over all questionnaires for questions in common for the discrete (N = 4 839) and the graphic scale (N = 5 406).

It is interesting to find that different types of questions tend to have different, but stable means. For instance, morality is normally rated higher than any other aspect of an action, while one's sociability is normally rated close to neutral. Further, the action is normally perceived as easy to perform, while if the action facilitated other goals is rated close to neutral.

A second and more powerful way to compare the two scales would be to estimate the strength of the statistical relation from one-way analysis of variance (Hays, 1963). First the individual means of the twenty variables in common were calculated. The outcome is presented in Figure 5.

The discrete scale seems to come out just a little better than the graphic scale. But the difference can very well be due to chance. In a quite similar study (Sjöberg, 1993), a five-category scale also came out just a little better than did a graphic rating scale. Thus, the belief that the graphic scale would be superior to a five-category discrete scale was not confirmed. The only real advantage with the graphic scale therefore appears to be on a practical level, i.e., the speed and correctness with which data can be read directly into a data file. But then one needs a program and those can be expensive.

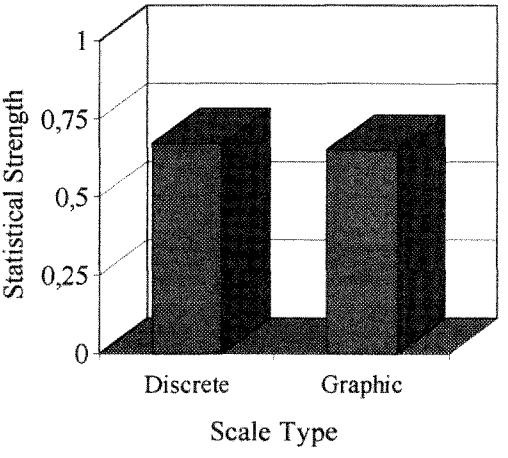

Figure 5. Discriminatory power of the discrete and the graphic scale.

Reliability, validity and rationality of results

The value of any scientific study depends on the *reliability* of the measurements, i.e., that a particular observation yields a "true" score, and the *validity*, i.e., that the measurements give a "true" picture of what is under study. In statistical terms reliability is a measure of the absence of random errors, while validity is a measure of the absence of systematic errors.

On top of those important aspects comes a *rational* interpretation of results. E.g., if, out of ten significant variables, nine contribute to build a coherent picture of something under study, while the tenth variable breaks this trend, the investigator must ask himself if this deviation is a true result, or a result just due to chance or a lack of validity of the deviating variable. If a $p<0.05$ level of significance is chosen on the average at least every twentieth variable should come out as significant just by chance, without any correspondence in reality. This means that even simple statistics, like accounting for means, must be carefully examined. A person with one foot in icy water and the other one in hot water, is not on the average feeling fine from a psychologist's point of view.

In psychological research, the problem of drop-outs and missing responses is an actual threat to validity. Many researchers do not account properly for these problems in their reports. Even though it is inevitable that a study involving specially selected persons, evolving during some period of time, has misfortunes of different kinds, they should certainly be accounted for as thoroughly as any other outcome of the study.

The main problem with drop-outs is not that they reduce the sample size and thus increase the error variance, when data are statistically analyzed. The main problem is that drop-outs may differ systematically from the subjects that choose to remain in the study. As the number of drop-outs increases, the validity of the results of the study decreases.

The number of missing responses has the same impact. Missing responses diminishes the data set, thus having a negative effect on tests of significance. But the main problem still is, that if people are unwilling to report some types of activities, then a systematic error exists, which in turn affects the validity of the study negatively.

The validity of the *made* reports, on the other hand, can be considered to be determined by two factors: *truthfulness* when answering questions and *memory failures*. In order to give a basis for a continued discussion, the number of drop-outs, missing reports and response delays in the studies in this thesis are presented in Table 5.

Table 5
The Number of Participants and the Number of Expected Actions in Different Studies Along With the Number of Drop-Outs, Missing Reports and Response Delay

Paper	Study	Participants	Drop-outs	Expected reports	Missing reports	Response delay[a]
1	Adult students	20	0	700	53	7.4
	Employed students	20	3	595	47	9.2
	Unemployed	20	0	700	123	8.5
	Art students	20	2	630	81	12.8
	Doctoral students	20	1	665	52	9.0
	Alcoholics	20	1	665	31	7.7
	Retired people	20	0	700	16	18.0
	Control subjects	20	1	665	82	9.0
	Control subjects	60	0	2 100	241	10.2
2	Problem drinkers	20	2	630	69	13.3
3	Social workers	20	1	665	31	24.1
4	Smokers	44	4	2 520	310	13.1
	Control subjects	40	2	1 330	70	14.4
5	Drinkers	40	5	2 205	333	15.3
	$\Sigma =$	384	22	14 770	1 539	$M = 12.3$

[a]Median delay in minutes.

The mean percentage of drop-outs in the studies altogether was 5.7 percent. As a rule of thumb, one drop-out per every study of 20 subjects could be expected. However, the numbers of drop-outs among the smokers and the drinkers were about twice as high as in other groups. This is not surprising considering they were up against a tough task.

The mean number of drop-outs in the studies presented in papers 1 and 3 must be considered very low. There was no observable common denominator amongst these drop-outs, except maybe for one thing: a loose tie between the drop-out *in spe* and the study for one reason or another. The employed students had as many as three drop-outs. This can probably be explained by the fact that this group was the most strained of all groups. They worked during day-time, studied during evening-time and on top of this they had small children. They were chosen exactly because they were so strained. The validity of the results of these studies can not have suffered in any significant way because of these drop-outs.

The mean number of drop-outs in the studies presented in papers 2, 4 and 5 must also be considered quite low. The groups were of a problematic kind, drug addicts, so an extra drop-out per group is not surprising. However, this extra drop-out cannot possibly influence the outcome of the studies in any systematic way. Hence, the validity of the results of the studies cannot be jeopardized in any serious way.

The mean percentage of missing reports was 10.4 percent. They were divided into three categories: *sleep* (33 percent), *technical problems* (31 percent) and *unknown problems* (36 percent). Problematic groups tended to have a higher non-response rate. The higher non-response rate among the unemployed was due to the fact that they slept much in the mornings, a shifted diurnal rhythm no doubt caused by their lack of work. The problem drinkers also slept late, but also had many problems of unknown nature. The smokers and the drinkers, on the other hand, had a higher non-response rate over all three categories. I draw the following conclusions:

- Missing reports because of sleep is reliable information and can only add to the validity of results.
- The technical problems that occurred were not systematic in a way that can affect the validity of the results. Even though we will never know how people experienced themselves and what they were doing deep down in basements (because of radio-shadow), most technical problems were singularly due to battery failures.
- Unknown problems is the only category that *could* include actions people were unwilling to report. But what could those actions be? Masturbating, fighting, quarreling, picking one's nose? Whatever those actions were, they were so infrequent that they would hardly have shown in the data analyses anyway. Probably it is the other way around: the most likely reason that people did not respond was that they simply *forgot*. Psychodynamic theories postulate that forgetfulness can be systematic, but this syndrome will not be further discussed here. The category

of omitted reports in question could constitute a threat to validity, but the size of the category substantially diminishes this threat.

Turning to the validity of reports again, the first question is to what extent people were truthful when answering a questionnaire. This is a question that was put to the subjects in the different groups at seminars, to which they were invited for a presentation of the results. The most common reaction to the question was surprise. To them appeared to be self-evident, and should be so even for us as the investigators, that they had done their very best. The only notion of importance in the sense discussed here, was that people reported that they sometimes could get a little frustrated or bored, when having to fill in still another questionnaire, therefore not paying the questions enough attention. The instructions originally given to them were to give their answers without too much considerations. In an uncomfortable mood, this request could perhaps be exaggerated. In what systematic ways the answers in that case would differ from the answers they otherwise would have given, had the mood been better, is not possible to tell. Those deviations do threaten the validity of responses, but on a whole people are believed to have been very truthful and conscientious as far as conscious mental activities are concerned. Unconscious deviations can not be traced, but are of course believed to exist. They hopefully had little influence on the validity of the answers as a whole.

The second and more critical question to the validity of the answers in the reports is memory failures due to distance in time between signal and questionnaire response. Memory failures must closely linked to this type of delay, since the memory of a situation disperses rather rapidly. It has been shown that goals rather than actions are remembered in retrospective reports, and odd deviations rather than routines (Black & Bower, 1979; Bower, Black & Turner, 1979). This means that memory-fading probably is systematic in various ways, so for the sake of validity of responses, great importance must be placed upon how soon respondents respond. Since the questionnaire contained so many detailed questions, the only accurate answers are those given immediately after a signal

As can be seen in Table 5, the mean time elapsed in all of the studies in the thesis was 12.3 minutes, which must be considered quite acceptable. Social workers had an extremely long time-lapse, no doubt due to the fact that they were very busy, not being able to leave situations because of clients. Retired people also had significantly longer time-lapse than other groups. They, on the other hand, just took it very easy, not rushing anything anymore.

The validity of the answers when using RAS is, for reasons here presented, believed to be much higher than for data generated by, for instance, diary reports or day-after-interviews. As long as people respond immediately and truthfully, measurement errors are believed to be insignificant. Reliability and validity then decrease with time, uncertain how fast and in what ways.

The validity of the results when using RAS, has so far been concerned only with the *internal validity*. The number of drop-outs and the number of missing reports are

believed not to constitute any threat in this respect, nor are people's truthfulness or memory failures. However, there could be a number of threats to *external validity*. One main category focuses on whether the behavior of the subjects in a study can be generalized to the target population. Another focuses on whether the research findings can be generalized to all of the environmental contexts of interest.

To start with the latter category, only the most important ecological threat to a study will be discussed here. Conducting studies on experimental groups and control groups at different times can constitute a threat to temporal validity. First, behavioral science has shown that people's behavior tends to vary over time. Cyclic variations on an annual basis are believed to exist, but the magnitude for different aspects of self experiences and action attributes is not well known. For obvious reasons it was not possible to carry through all studies at the same time. The cyclic variation is a real threat to the external validity. However, it is believed to be rather small. The studies on the smokers and the drinkers were both conducted during springtime. The study on the controls to these studies, on the other hand, was conducted during autumn. At this point the only thing to hope for, is further research to estimate the annual variation in different behavior variables. It can be added that this factor is virtually never discussed in psychological research. E.g., reports on empirical research almost never mention the time of the year that data were collected.

Second, historical events bound to influence people in general is another kind of threat to temporal validity. No such threats have been identified during the course of the studies. However, general economic conditions did vary in the time interval 1983-89. One woman among the social workers gave birth during the week of the study. Because of considerations to external validity, she was excluded from the data analyses.

The question of generalization to the target population is usually referred to as population validity. The absence of random selection from the target population is a threat of this kind. Strictly speaking, most subjects in the studies accounted for have been selected on a stratified basis. However, this has been an intended feature of the studies, to try to reduce the costs of recruiting subjects. Greater effort was invested to make the samples in the studies presented in papers 4-5 match a sample of the whole population, within an age interval. The stratified samples limit the generalizations possible of the findings. The results presented in the papers are presented in the light of this.

Another threat to population validity is *how* subjects are chosen. Some different ways of recruiting subjects were used *across* the studies presented in papers 1-3. However, all subjects *within* a group were selected the same way. From a cost-restricting point of view, this was also a necessity. The subjects in the studies presented in papers 4-5 were all recruited the same way, including the control subjects. Only with the drinkers the costs restricted the recruiting to some extent.

The fact that all subjects in all studies volunteered to participate, makes it inevitable that the groups differ from the general population. However, it can be more or

less difficult to recruit subjects. As a general rule, the risk of drawing invalid generalizations because of *selection bias*, tends to increase directly as a function of the difficulty involved in obtaining subjects for the study. From this point of view, the subjects in the studies presented in papers 1-3 were equally easy to recruit. However, in the studies presented in papers 4-5, the smokers and the controls were easy to recruit, but the drinkers difficult. This must in part lower the validity of the study of the drinkers, but since most results from this study are comparable with the results presented in paper 2 on problem drinkers, validity cannot have been that badly affected.

It is the belief of the investigator, that the results from the studies presented in this thesis are quite reliable and valid. They have been rationally interpreted with the best of intentions. As always, improvements can be done to avoid weaknesses in future research.

GENERAL DISCUSSION

The aim of this thesis is to evaluate the method of Random Action Sampling. This cannot be done without a discussion of the reliability and validity of obtained results in comparison with those of other methods. However, first some topics of general interest to behavioral science will be discussed. This section and the thesis is concluded with some remarks about future research.

The discussion about *stress* and its influence on health and well-being is a recurrent one in the social sciences. That stress lowers job satisfaction is one of the best documented effects (Kahn 1992). According to Karasek's model, job stress increases when the possibility to control decreases and the job demands increases (Karasek, 1990). However, job stress is only one example of stress in the total life-situation. Other sources of stress can be the family, the possibilities to have a relaxing leisure time, etc. The interaction between family life and the job has been shown to have potentials to become a stressing conflict (Frone *at al.*, 1991).

The stress level has been examined in all studies performed. The results confirm some common beliefs and contradict others. Newly retired people do not seem to be stressed. It is the young studying people who are stressed. The stress level in the middle of life with work and children, seems, to a high degree, to be related to what kind of work you have, if any. Social workers for instance seem to be much more stressed than people in general, unemployed much less. Finally, the stress profile of smokers does not seem to differ from people in general, while this certainly is the case for drinkers. Two studies on drinkers have shown the same general characteristics, the low stress level being rather surprising.

The literature on smokers and drinkers is so abundant, that it probably would take one researcher's life-time to systematize all the results. One main reason for this is

that the results to a large degree are contradictory. Numerous studies on the two categories of addicts have been conducted, from medical viewpoints, from psychological viewpoints, from sociological viewpoints, from economical viewpoints, etc. But to my knowledge, few have studied them under normal conditions. Hence, the main difference stressed here lies in the methodological approach. More about that later. Here, some remarks about the syndromes of smoking and drinking.

The use of some *substance* to modify mood or behavior under certain circumstances is generally accepted and regarded as normal and appropriate in our society. Such use includes recreational drinking of alcohol and the use of caffeine, in the form of coffee or tea, as stimulant. In addition, certain psychoactive substances are used in medical treatment. The use of nicotine, on the other hand, can only be said to be tolerated in society of today. Then there is the large illegal use of a variety of psychoactive substances.

Nicotine and alcohol are two psychoactive chemical substances that essentially have opposite effects on the nervous system. Nicotine is facilitating and alcohol is inhibiting, even though the opposite effects can occur under some circumstances. In terms more related to inner experiences, nicotine is stimulating while alcohol is tranquilizing. Moreover, it is a common habit among smokers also to have some coffee while smoking, which in turn reinforces the stimulating effect. Drinkers, on the other hand, often combine drinking with smoking, thereby contra-balancing the desensitizing influence of alcohol. In comparison with each other, smokers seem to be much more surprised than drinkers, who seem to be much more of the opposite (bored?). Is this to be interpreted that smokers are sensation seekers, and drinkers safety seekers? In future research with RAS, more emphasis could be placed on discriminating variables aimed at mapping the internal conditions of both smokers and drinkers.

The *cost* for the misuse and abuse of nicotine and alcohol is difficult to estimate. The cost for the individual purchase of the goods can be quite substantial. Then there is the loss of working-time, a cost that is probably even higher. On top of that comes the costs for drug-related accidents, medical care and premature death. The total alcohol-related cost for Sweden in 1991 was estimated to the amount of 100 billions SEK (Johnson, 1991). Nicotine-related costs for premature death, early retirement pensions and sickness benefits for Sweden the same year was estimated to 10 billions SEK (Ramström, 1991).

If man was an altogether rational being, man would not use drugs. The factual use of drugs shows that man needs to manipulate reality from time to time. For society to abstain is a long process. Research can try to find out *how* and *why* people smoke and drink, but that will probably not help the majority already in the calamity. The importance in mapping the behavioral patterns of smokers and drinkers lies in the possibility to gain trustworthy knowledge. This in turn can be used to influence attitudes to smoking and drinking, especially in the young generation, attitudes based on scientific facts rather than stereotyped morality.

Different types of cessation programmes have different *success rates*. However, the cost varies even more. The cost involved when using RAS is probably much lower than the cost of most other programmes, and the method is definitely much more convenient for the participants. They do not have to attend therapy groups, evening group meetings, etc. They can live their ordinary life, electronically supervised. This is important in the sense that quitting smoking or drinking also means to change other habits. The smoker should, at least for some time, also give up drinking coffee, and the drinker should definitely try to give up smoking.

It is of course worth while to reflect on the comparatively good results in the studies of the smokers and the drinkers. The participants were highly motivated and they were not abusers in the sense discussed in the reports. The method was interesting to them and they had an enthusiastic experimental leader. All these features are necessary ingredients in any cessation programme. There is no programme that can suite everybody. However, even if only a limited success rate is achieved with a special programme, the number of different kinds of cessation programmes is probably large enough to ensure anyone with an addictive problem to find adequate support. In other words, the main problem is to *find the right* cessation programme.

Another, and scientifically speaking, better way to evaluate the success rate of a cessation programme than comparing it with other programmes, would be to form a control group out of applicants that does not undergo the treatment in the cessation programme. This would have been possible in the smoking study, but not in the alcohol study for economic reasons. On the other hand, ethical questions arise about the morality of such an experimental design, when it comes to treatment of people with problems. First to give them hope of participation, then to dismiss them with some made up explanation, finally to engage them once again one or five years later would make *me* feel very uncomfortable.

The most commonly used methods for data collection by behavioral scientists are: *participating observation*, *interviews*, *diaries*, *questionnaires* and *time-sampling*. Depending on what aim a study has one or two of these methods are usually chosen.

Observation during participation is not that widely used any more. For some purposes it is excellent. However, as soon as the participating observer interacts in a way that changes the behavior of people around him, the validity of the method is substantially decreased.

Interviews can be structured or unstructured. Usually they are structured according to a questionnaire. This makes coding easier, which in turn affects the reliability and validity of the answers in a favorable way. One type of interview is the yesterday interview method used by Eliasson and Klevmarken (1981) as mentioned in the introduction. Even if the objective of their studies was to collect data about people's use of their time, the method can not really be considered a time-sampling method. For that it measures the subjects at too few occasions, only 3-4 times a year. But for their purposes, this was quite sufficient.

What about the reliability and validity of the answers obtained this way? To what degree is it possible to remember yesterdays activities and for what span of time they lasted? In large it is obviously possible. But is it possible to remember what one was doing during 1:33-1:43 p.m. yesterday? I can not! Apart from sitting in front of my PC almost all working-day, I might have done three short-duration actions like gone to the W.C., drunk some apple-juice and talked to the secretary.

A comparison between retrospective interviews and time-sampling data showed that about 20 percent more time per week was "accounted for" by the retrospective interviews (Brandstätter, Barthel & Fünfgelt, 1984). In spite of these difficulties the Eliasson and Klevmarken data appear to be quite reliable. In paper 1 a grouping of the actions from the different studies according to their categories gave a convincing correspondence of results. For their purpose the method used was adequate. However, it would not have been possible to get reliable data on a lot of self statements and action attributes for each action the day before. The human mind is just not designed to remember such a large number of registrations. Like dreams, we forget the print of the continuously passing moments rather rapidly. Only a vague structure is remembered the next day and if nothing unusual happens, the day before yesterday is soon totally past on to the subconscious.

Diaries can also be useful for some purposes, and the reliability and validity of the reports are, in this case as the former one, linked to what type of questions are asked. If instructed to report too many details, the subjects are most likely to start fabricating desired answers.

The most popular method used among behavioral scientists is the survey with questionnaires. It allows the investigator to reach a large number of subjects at the same time. The most common survey is the one sent to a random sample of the population. But a company might use a survey directed to its personnel to have some problems enlightened. The biggest problem with surveys is the relatively large number of non-responses. A response rate of 70 percent must be considered high. But can the conclusions from the data analyses be generalized to the population from which the sample was drawn? It is most likely that the non-respondents differ from the respondents in systematic ways, thus seriously threatening the validity of results. It would for instance not be possible to map the extent of alcohol use, misuse and abuse using a survey method. The abusers and most of the misusers would probably not answer. In spite of this and other threats to validity, the survey method is widely used.

If more detailed information about people's everyday life is required, the time-sampling method is to be preferred. The method essentially involves measuring a subject a couple of times per day over several consecutive days. The technique to administer at what times the subjects are going to report can vary. One possibility is to equip the subjects with some sort of mechanical or electronic beeper, another to give the subjects a time-schedule and leave it up to them to remember the specific time points when to report. Brandstätter (1994) used this last mentioned technique in

a number of studies. However, even if the time points are generated by a computer, they do not strike the subjects with surprise. Also, even if some subjects had wristwatches that could be made to beep at a programmed time point, still the subjects would know subconsciously when the beep would come, just like I usually wake up in the morning a couple of minutes before the alarm-clock turns on. To some extent, this is likely to alter their choice of action and their mood for at least two reasons. First, everyone gets a little excited when a time point is coming up, so the mood estimation gets biased. Second, there may be a high probability that a visit to the toilet or the fraternizing with a spouse will be postponed, if a time point is arriving. Infrequent, but humanly important activities will probably not be reported.

There is no such bias with random action sampling via a paging receiver. The subjects know that a specific number of signals will come each day, but never in advance *when*. They will of course realize that the investigator has divided the day into a number of time periods, so after having received a signal they can be pretty sure there will not come another one within the minute. Still this is far better than any method has ever achieved, concerning the validity of the responses. In the data from the studies using RAS, reports from the lavatory occurs as frequently as they should. Even daytime sexual intercourse has been reported, at one time from both subjects involved. Sensitive and low-frequency activities are more likely to get lost with other types of time-sampling methods.

Selection bias is an important issue and researchers have to accept a certain invalidity of results because of it. To begin with, there are people who will *never* participate in *any* study. Then there are people who will not participate in a *certain type* of study. Finally there are people who are willing to participate in a study, but for one reason or another just *cannot* go through with it. The sizes of these categories are believed to vary according to the method used. As has been mentioned before, selection bias is inversely related to the difficulties to get participants in a study. There were no difficulties to get participants in the studies presented in paper 1. On the contrary it was surprisingly easy. People became interested because someone was interested in them, to carry a paging receiver made them feel important, and the study would make them able to take a look at their own lives. Advertising for participants in the study presented in paper 2 gave a lot more respondents than could actually be admitted, and the same was true for the studies presented in papers 4-5. Selection bias in those studies is probably no big problem.

Reliable estimations of selection bias are presented in papers 1 and 3. In the former, 75 percent of the control subjects asked accepted immediately. In the latter, 69 percent accepted immediately, 14 percent were unable to participate and 17 percent were unwilling. If a division of the latter category is made between the never-participants (~ 7 percent) and the picky-participants (~ 10 percent) and the cannot-participants are added (~ 14 percent), a fairly reliable estimate of the proportions of different non-participation categories is accomplished. It is my belief that this estimate is rather representative for all studies presented in this thesis.

For the future, first some *methodological ideas* will be proposed. They may seem as details, but the whole method of RAS is a needle-work of closely tied methodological threads. The reliability and the validity of results depend on the neatness of them. Finally, some propositions about future research with RAS will be made.

Signals to the subjects can be prolonged to include both *day and night.* Since the subjects should be permitted to turn off the paging receiver during sleeping-time, signals round the clock will not disturb them. Important information about people's day and night habits and diurnal moods will be gained.

The *number of signals* per day is of course closely linked to the aim of the study. A large number of signals must be very well justified to subjects not to tire them in the study. Six signals per 24 hours is suggested as a moderate number. Since people usually sleep about 8 hours, this will mean an average of 4 reports a day. If there are reasons for it of course the number of signals per day can be varied in the same unpredictable way as to what time a signal arrives.

The *number of days* a subject participates in a study does not have to be fixed. Knowing in advance for how long a time a study is going on, is believed to have a cyclic affect on the subject, at this point difficult knowing what kind. If a large study were to be conducted on, for instance, several hundreds of young people, in order to map their lives, it would be a methodological advantage to recruit them continuously and to let the youngster decide him/herself, week to week, when to quit. Not knowing in advance how long the study will last, cannot create the type of cyclic influence mentioned above. Further, letting the subjects start and stop at different times will balance out start and stop effects in the data. If one is interested in mapping the cyclicity of people's mood over days, weeks and seasons, the suggested design will improve the already good validity of RAS.

To offer participants a *tax-free fee* is believed to improve their willingness to participate. It is of course important that both experimental groups and control groups are treated the same way in this respect, if it is believed to reduce selection bias. The fee to the young participants in the study sketched above could be made proportional to the length of participation, thus motivating them to remain in the study.

If studies are *followed up* by letters to the former participants with a questionnaire, it is important to stress to the participants that the moment of measurement is the one when he or she opened the questionnaire and make them answer immediately. Reliability and validity of this kind of responses are also inversely related to the passing of time. Given time, the respondents are liable to change behavior in some aspects, smokers cutting down on smoking, drinkers cutting down on drinking, to make the answers about the use of the drugs more socially desirable. Experience tells that it is actually better to call the participants and talk to them personally. The moment of measurement is then the telephone call, and the quality of the personal contact will dictate the truthfulness of the answers.

As mentioned before, the *act* is the key concept in RAS. The 'action' is one side of the act, 'self statements' the other. The subjects were asked what they were doing

when the signal came, and if they were doing anything else at the same time. Looking only at control subjects, they at all times reported they were doing something, and only reported doing something else at the same time in 38 percent of the cases. It is my belief that people are more involved in life than that. Another approach to this is suggested by Little (1983) and Palys and Little (1983). They assume that people always are committed to a limited number of "personal projects", such as completing an article, training the daughter for a children's' day-center, planning for a summer vacation, etc.

Since the 'action' is so central to RAS, an elaboration of the reported ongoing activity would be highly desirable. Instead of reporting the closest action framework to the first question, and maybe some more unimportant action on the side to the second question, an elaboration could read like this: 1) What *exactly* did you do when the signal came? 2) What is the closest action *context*? 3) What is the *project* you are acting within? Let us say that the answers to the questions would be: 1) I was just leaving the elevator! 2) I was on my way to have lunch! 3) I am working on an article! As a contrast, the answers to the present two questions would have been: 1) I was on my way to have lunch! 2) No! The coding of the two sets of questions would have looked like this: 1) translocation 2) refreshments 3) paid work - 1) translocation 2) nothing.

It is true that the questionnaire contained four questions where the subjects had to state, if possible at four levels of abstraction, the reasons they had for performing an action. These questions were perceived as very hard to answer by most subjects. In future questionnaires, therefore, a revision of those four questions along with the two action questions, could give at least a three-leveled question, which would make it easier for the participants, at the same time as the action question becomes more comprehensive.

There is a conflict of interest between a preferred *anonymity* of the participants and their preferred known identity to the investigator. It can only increase the participants willingness to give truthful answers if they do not have to put their names on the questionnaires. It is quite sufficient to use an identity code, e.g., the number of the paging receiver. With this code, the investigator will be able to identify a particular participant's answers, which is important if the answers are going to be analyzed in connection with background variables. For long-term follow-ups, as long as five years after a study, id-numbers guarantee a successful search. After such a period, up to 50 percent can be expected to have migrated.

Finally, beside the requirement that a questionnaire always should be handy and easy to fill in, a good advice is to profile the questions to measure both *internal* (personal) and *external* (environmental) conditions. Another query is to decide the proportions between *open questions* and *rating scales*, open questions always being a little more difficult to handle for both parties. At last, the questions can be formulated in two temporal ways a) what or how something was at the moment of the signal b) what or in what ways something has been or changed since the last signal.

Depending on the purpose of the study, the *momentary* or the *cumulative* questions can dominate.

The method of RAS is a field-study procedure aimed at mapping people's everyday life, with a possibility to influence it and infer causal relationships. The target population can be *any* category of people that an investigator wants to study. It is a method well developed at this point, to be placed at the disposal of a wider branch of society. Both behavioral theorists in a broad sense, physicians, psychologists, sociologists, etc., and practitioners from different fields of human welfare in a broad sense, health care, therapy, criminology, etc., can benefit from adding this application to their arsenal of methods. Even though reliability and validity of the method are very satisfactory compared with many other methods, it is presented as a complement to those methods, aiming at finding its own niche.

The method chosen in a study is of course dependent on limitations such as time and money. However, it is my belief that the matter of *convenience* has a much greater impact on the choice, than is willingly admitted. Researches, like people in general, prefer to do what they usually do in the way they are used to do it. In an effort to persuade, it would be very interesting to compare the results of a survey study on, e.g., 1 000 subjects to those of a RAS study on, e.g., 100 subjects drawn from the same population. The matters of interest for the studies being, e.g., smoking, drinking and sexual habits, the RAS method, to my conviction, would produce much more valid results.

The three pleasure activities just mentioned are very important for the understanding of and feed-back to the *young generation* in particular. Cumulative measures are not the only thing of interest here. The best way to handle nicotine must be never to start smoking. Alcohol, on the other hand, is much more difficult to deal with, as long as it is legitimate in large social-economic groups in society to get drunk on a regular basis. With AIDS and unemployment as new hallmarks, the prerequisites for the young generation's identification of today have drastically changed. It appears as if they have begun to substitute fashion for passion and beauty for duty. The rapidly increasing number of street restaurants in our big cities reflects a rapidly increasing number of smoking and drinking young people. The lifestyle of the young generation would certainly be worth mapping with RAS. Interesting work in the field using this kind of methodology has already been conducted (Csikszentmihalyi & Larson, 1984).

An exploration of perceived *risk* of different kinds of hazards is essential for many reasons. According to Sjöberg (1994), many studies have shown that there is a clear tendency of people to rate the personal risk for the occurrence of something unwanted as less as the risk for the same unwanted thing to happen to others. This difference between perceived personal and general risk is correlated with the possibility to control the danger. The discrepancy was large concerning alcohol and AIDS, medium for malignant melanoma, and small for environmental pollution. This means that people believe they can control drinking and sex, and probably also

smoking, thus actually being exposed to a smaller personal risk than people in general. The incidents of smoking- and drinking-related diseases are, epidemiologically speaking, low for the young generation, but this period in life is also the one when quite a few health-hazard habits are acquired and made manifest. AIDS, on the other hand, is bound to be linked with promiscuity, most likely correlated with the experimenting lifestyle of the young generation.

Risk perception could be an important new angle to any RAS study. Further, the stress aspect of everyday life is also very central to health and well-being. Future research with RAS could focus more on stress determinants and its consequences. However, the data that already exist can be even more thoroughly analyzed in these respects. The gender aspect is a very important one too, and more emphasis could be placed on it in future studies. However, there is a large variety of demographic variables of interest, age actually seemingly having a greater impact than gender. Demographic variables are actually so easily linked to the data of the ongoing events, that interesting analyses are easily computed.

The basic concept behind the method of Random Action Sampling is easily understood, but it takes a skilled and interested researcher to carry it through. Maybe this can explain why the method has not been employed by an increasing number of researchers. The whole idea may appear so trivial that it is almost funny, and maybe that is why people often smile when they hear about it for the first time. On the other hand, having accepted the ingenuity of the idea, the way to perform a study in reality soon may be filled with too many uncertainties. On top of that, the researcher has to be technically interested, a quality that only occasionally seems to be combined with a behavioral interest. If the explanation for the lack of applications instead is lack of knowledge about the method, it is my hope that this thesis can alter this unfortunate predicament.

To conclude, my intention with this thesis has been to present and evaluate a new and elaborated method for behavioral research. The observations yielded by application of this method have been numerous. Interesting results have emerged with exceptionally high resolution. With more detailed information about people, without violating their right to integrity, it will be possible to understand even more about human beings.

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ACTION AND EMOTION IN EVERYDAY LIFE

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ACTION AND EMOTION IN EVERYDAY LIFE

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ABSTRACT

This study of naturally occurring behavior employed a "beeper technique" to investigate the actions carried out by 152 subjects in eight different groups, viz. adult students, employed students who were also parents, unemployed, art students, doctoral students, alcoholics, retired people and a control group. Actions were sampled for seven subsequent days, five times per day between 8 a.m. and 10 p.m. at randomly selected occasions. Each action was rated on a number of variables, shortly after it was sampled (median delay approximately 10 min). Some of the findings were: Time allocation corresponded well with national estimates. Being under situational control was highly aversive. Instrumental and consummatory orientations correlated positively. The background variables were, on the whole, only rather weakly related to action ratings, but it was found that women and retired persons tended to report a higher level of well-being.

Key words: Emotion, action sampling, well-being.

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INTRODUCTION

Although behavior is a central and classical concept in psychology it has seldom been explicated (Sjöberg, 1983) and even more seldom studied in natural settings. The best known exception is that of ecological psychology (Barker, 1968), which will be further discussed below. The reasons for the neglect of the study of naturally occurring behavior are probably both practical and theoretical. Practically, it is not straightforward how one should go about studying behavior in natural settings. Theoretically, and perhaps more interesting, the notion of studying naturally occurring behavior immediately exposes inherent weaknesses in the behaviorist position. Such behavior cannot be observed only from "the outside" of a person. It is obvious that what a person does is not revealed by his or her "overt movements" and that asking about actions is the only really feasible way of finding out.

Ecological psychology was, for a number of years, the only attempt at studying naturally occurring behavior in psychology. In spite of the fact that ecological psychology has been established for at least 30 years, and in spite of the frequent lip-service paid to the importance of studying ecologically relevant conditions and behavior (Brunswik, 1956; cf. Sjöberg, 1971), the ecological approach has made little impact on mainstream work in psychology.

It should be added here that ecological psychology early turned from investigations of actually occurring individual behavior, as exemplified in a famous book length report on one boy's day by Barker and Wright (1951), and concentrated on mapping the environment in terms of behavior settings (Barker *et al.*, 1978; Wicker, 1988). This work has produced some fruitful insights, especially into the importance of some organizational variables for measuring behavior and quality of life, most notably the size of organizations and the associated concept of manning of behavior settings (Barker & Gump, 1964; Wicker, *et al.*, 1972). However, the individual perspective is lost in this approach which may, in the long run, turn out to be more congenial with sociological and geographical mappings of the environment (Chapin, 1974; Robinson, 1977; Szalai *et al.*, 1972) than with a psychological approach.

Hence, there is a lack of knowledge concerning the psychological aspects of naturally occurring behavior. The general purpose of the work reported here was to study such naturally occurring, everyday life behavior, by investigating behavior samples in groups of people which can be expected to differ in interesting ways when it comes, among other things, to external restrictions on their acts.

The empirical study of behavior is difficult for several reasons. One of the most important reasons is a lack of agreement on definitional issues. The present approach is that of studying *acts*. Acts are naturally bounded and phenomenologically present entities. We assume that asking a person what he or she does produces a description of the act the person is engaged in, as he or she conceives it.

Acting is perceived as a type of mental activity under conscious control. Acting is a kind of mental activity, but all mental events are not acting. Counter examples to acting are dreaming and day dreaming. In the following we shall use action and behavior as synonyms.

Observations of naturally occurring behavior may be performed either by the actor or by an observer and they may be simultaneous or retrospective. Since the actor may be assumed to have privileged access (Harre' & Secord, 1972) to some important types of information, we have preferred to work with data generated by self observation reports. Since forgetting and other types of memory distortion are unavoidable in retrospective reports, we have also tried to obtain data as quickly as possible after the act has been carried out.

Our solution to the problem of studying naturally occurring behavior utilizes time sampling. At certain points in time, picked at random, persons are asked to give a report about their present activity. A few previous studies have utilized such an approach (e.g., Csikszentmihalyi, 1975; Brandstätter, 1981, 1983; Pawlik & Buse, 1982; Sjöberg, 1981). Note that this is a quite different approach from the one often used by economists and sociologists, which entails the collection of retrospective reports about chunks of time in diaries. It is also quite different from asking persons to report how much time they have spent on various types of activities. It must, in such studies, be assumed that the types of activities are understood in the same way by the researcher and the subject. Examples of current work with such an orientation are given by Eliasson and Klevmarken (1981) and Klevmarken, 1984; 1986).

Since we shall have reason to return to Klevmarken's results, some more detailed remarks on his methods are in order. The basic method used by him was a "yesterday question technique" based on a method devised at ISR, University of Michigan (Klevmarken, 1986). In this method the subject is interviewed about all activities that he or she carried out during the preceding 24 hours and is asked to indicate, for each activity, when it started and ended. Activities are classified into 78 categories and then further aggregated into 10 broad groups, viz. market work, household work, care and sleep, purchase, repair and maintenance, education, pleasure and recreation, travel, other communication and miscellaneous. Although these categories seem to have been motivated primarily by economical considerations and commonsense considerations, we shall find them useful for comparative purposes.

According to Klevmarken the method gives results quite comparable to a "beeper technique", which is more similar to our method. Klevmarken compared the yesterday question technique with time estimates based on retrospective reporting of 14 days of activities and found clear under-reporting in the latter case, while the yesterday question technique according to him seemed to yield reliable results since the results agreed with those obtained in other countries with the same technique: in US data, and with a diary of the "leave behind" type in Finnish data, see Flood (1983). It will be informative in the present study, to compare the results obtained with those reported by Klevmarken for a nationally representative sample.

Summing up, the purpose of the present study was to investigate the way everyday actions are described and explained by the actors themselves and to relate the perceived properties of these actions to internal and external determinants.

METHOD

Subjects

Subjects belonged to eight different groups, described in detail below[1].

Adult students. In this group, a total of 20 subjects participated, 12 women and eight men, their mean ages being 24 and 31 years respectively. All the subjects were full-time students attending adult education courses. Only four of them had some part-time work.

Employed students. A total of 20 subjects participated, 12 women and eight men, their mean ages being 33 and 32 years respectively. Ten worked full-time and the rest between 40 percent and 80 percent. The most common rate of participation in evening classes was once a week.

Unemployed persons. A total of 20 subjects participated, seven women and 13 men, their mean ages being 25 and 26 years respectively. All were registered as unemployed.

Art students. A total of 20 subjects participated, 11 women and nine men, their mean ages being 30 and 29 years respectively. All attended Art College at the University of Göteborg.

Doctoral students. A total of 20 subjects participated, seven women and 13 men, their mean ages being 42 and 31 years respectively. All were doing research and all were studying for a Ph.D.

Alcoholics. A total of 20 subjects participated, 10 women and 10 men, their mean ages being 46 years for both groups. All regularly attended a polyclinic for treatment of alcoholics. They were committed to staying sober during treatment; relapses were relatively rare.

Retired people. A total of 20 subjects participated, 10 women and 10 men, their mean ages being 67 years for both groups. All had been retired for two years, but three still worked a considerable number of hours a week.

Control group. A random sample of 2 000 persons living in Göteborg and three neighboring municipalities was first obtained. From this sample we obtained a random selection of persons, given the restrictions that (a) they should be between 20 and 70 years old, (b) there should be an equal number of males and females and (c) all income classes should be represented. The total control group was also constrained so as to have a rectangular distribution of age and income. The persons selected for the control group were initially approached by means of a letter which

[1] Further information is available in Sjöberg & Magneberg (1987).

described the study. A week later, a phone call was made, as stated in the letter. Approximately 80 percent of the men and 70 percent of the women agreed to participate in the study. A total of 20 subjects participated, 10 women and 10 men, their mean ages being 45 and 44 years respectively.

Procedure

Each subject was given 35 copies of the questionnaire, a pocket size paging receiver and written instructions stating that signals were to be expected five points of time each day for seven subsequent days. The paging receiver made it possible to reach all subjects simultaneously wherever they were in Sweden by means of the FM broadcasting network. The transmitting times for the signals were selected at random, after having divided the day into five time periods. Every signal sent to the subjects was initiated by the investigator. Subjects did not know in advance when a signal was about to be transmitted.

The subjects were instructed to carry the pager from the time they woke up until the time they went to bed, with the modification that no signals were to be transmitted before 8 a.m. or after 10 p.m. When the signal was received, the subjects were to register and evaluate what they were doing at that very moment, preferably immediately, but otherwise as soon as it was convenient. They were to use the questionnaire and answer all of the questions. A numerical device on the pager showed in a coded form the consecutive order of the signal each day, along with a code showing the time the signal was transmitted. The code for the consecutive order made it possible for the subjects to realize, at an early stage, if a signal had passed unnoticed. The time-code was to be written down on the questionnaire along with the time when the subject actually answered it. The pager could memorize two time codes, which could be useful in cases when the next signal came before they had been able to respond to the former.

The subjects were instructed to try to ignore the fact that they were carrying the pager and to carry on with everyday life as normal. When the study was completed after one week, the paging receiver and the questionnaires were returned.

Questionnaire

The questionnaire had 29 questions, some of which had sub-questions, (see Appendix A, Sjöberg & Magneberg, 1987). There were two main types of questions - open questions and rating scales. In the former category, the subjects were first asked to state what they were doing when the signal arrived, and if they were doing something else simultaneously. Then they were asked about their location and later about the most direct cause of their mood and what the goal of their action was. Finally, at the end of the questionnaire they had to state, if possible at four levels of abstraction, the reasons they had for performing the action stated. The questions were coded according to a constructed schedule with a large number of categories for each question (given as Appendix B in Sjöberg & Magneberg, 1987).

The subjects were also asked to rate several aspects of the action. The following questions used a bipolar rating scale with five categories:

- mood (eight scales of mood dimensions described by Sjöberg *et al.*, 1979)
- own initiative
- preference to do something else
- how close (timewise) the action was to the goal
- frequency of the action
- importance of the action
- anticipated result
- estimated morality (alt. - if the question was not relevant)
- ease of performing the action
- to what extent the action hindered or facilitated other goals
- possibility to influence the situation
- possibility to leave the situation
- if the action was regretted
- how pleasant it was to perform the action
- the situational stress

The following questions used a unipolar rating scale with five categories:

- emotions (eight scales of emotional dimensions described by Tomkins and Izard; see e.g., Izard, 1977)
- external circumstances (three scales of the extent to which the action was facilitated, blocked or steered by the environment).

Ratings were to be made for each of the four open questions in the last part of the questionnaire where the subjects were asked to give a "deeper" explanation of each action. They were asked to rate, on a bipolar rating scale with five categories, to what extent the action was carried out:

- for what it might lead to (instrumental action - goal orientation)
- for its own sake (consummatory action - value orientation)
- because of external circumstances (situational causation - situational orientation)

The subjects were also given a chance to give reasons other than the three types stated. Further, there was one question whether the mood was due to the past, present or the future, using a bipolar scale with three categories. Another question dealt with the duration of the action, using a unipolar scale with five categories[2]. Finally one question asked about other participants in the action. Here the actually reported number was coded if these other persons could be considered significant; "class" was coded as 20.

[2] The time required to perform the action was rated. The response categories were <15 min, 15 min-1 h, 1-2 h, 2-8 h, >8 h and "unfinished". However, tha last category was considered unclear since it could refer to activity ongoing at the time of rating and responses in that category were scored as missing data.

RESULTS

Scoring

The reply frequency was 91 percent of all signals and must be considered quite high for a study conducted in the everyday environment of the subjects.

The actions were coded by two persons. The within judge reliability (the proportion of equal judgments) was 0.76 and 0.60, respectively, and the between judge reliability was 0.81 and 0.61, respectively.

The median time-elapse between signal and questionnaire response was 10 min and must be considered quite acceptable.

Comparison with national sample

Interpretation of the present data is facilitated by a comparison with data reported by Klevmarken (1986). Klevmarken studied a random sample of the Swedish population. Using retrospective interviews he divided the 24 hours of a day and night into 10 categories and gave estimates of mean time spent on each category. The categories used were: 1. Market work, 2. Household work, 3. Care and sleep, 4. Shopping, 5. Repair and maintenance, 6. Educational activity, 7. Pleasure and recreation, 8. Travel, 9. Other communication, 10. Miscellaneous.

The different action categories in Table 1 have been grouped and ordered according to Klevmarken's categories. In order to compare with our data, we had to pool some of our categories and to exclude a few. Since we did not sample any actions between 10 p.m. and 8 a.m., an estimation of the frequencies of different actions during these 10 hours had to be made. We assumed that our subjects slept the same amount of time per 24 hours as Klevmarken's subjects. The amount of sleep and rest daily during the 14 hours investigated in our study, including the occasions when no report was given because of sleep, was subtracted from the total amount of sleep and rest in Klevmarken's data. The remaining amount of time for sleep and rest was subtracted from our 10 hours, leaving us with 11-12 percent of the time unaccounted for[3]. This time was proportionally distributed onto relevant action categories. In Figure 1 the result of this comparison is presented, both in reference to all our subjects and to the control group alone.

Unfortunately our data do not permit us to separate eating and drinking from other action categories. An estimation of time allocation for this type of actions alone would be approximately 10 percent of the 14 hours every day. This would increase the total amount of time in category 3 above for our subjects with some 5-6 percent, with a proportional decrease for other categories.

On the whole, it is interesting to note the correspondence between the different groups of data. The different methodology apparently does not give substantial differences on this level of aggregation.

[3] In the original article the last two sentences were mixed up to one.

Table 1
Percentage of Different Actions for the Eight Groups

	Group[a]							
Type of action	AdS	EmS	Uem	ArS	DoS	Alc	Ret	Con
Paid work	2.5	18.0	1.0	1.1	5.2	11.8	2.3	15.0
Break, waiting	2.8	2.6	0.9	1.8	0.8	2.7	0.7	1.5
Seeking employment	-	-	1.7	-	0.8	0.2	-	-
Housework	7.3	10.2	10.9	9.8	8.0	13.7	19.3	17.8
Rest, sleep	4.3	1.8	3.6	4.4	2.0	2.7	2.2	1.5
Personal hygiene	3.7	3.8	4.0	4.0	1.6	2.5	4.2	2.4
Personal beautification	1.1	0.5	0.2	0.4	0.5	0.9	0.6	0.7
Care of children	0.8	5.5	-	3.5	4.9	-	0.6	3.6
Care of pets	0.5	-	1.4	0.2	0.3	0.8	1.0	0.2
Confined to bed	-	0.5	-	0.4	-	-	-	-
Running an errand	3.6	1.5	3.5	1.8	2.1	3.3	4.4	4.3
Health care	0.6	0.4	-	0.2	0.3	0.5	0.7	0.7
Psychiatric care	-	-	-	-	0.2	0.3	-	-
Repair work	0.3	0.2	1.9	1.8	0.3	0.8	0.9	4.4
Education	25.7	11.7	3.3	19.5	29.0	1.1	0.1	1.7
Acquiring information	6.6	3.5	10.2	3.5	7.5	5.8	11.3	5.3
Examinations	2.0	0.9	0.2	-	-	-	-	-
Relationship with others	12.1	17.9	15.4	20.9	12.1	12.3	7.7	11.1
Relationship with spouse	0.6	0.5	0.9	1.3	0.8	0.6	0.3	0.3
Recreation, relaxation	9.4	5.5	13.7	4.4	5.4	17.0	17.3	10.6
Places of entertainment	1.1	0.5	2.6	1.5	0.7	1.4	1.2	0.9
Special hobbies	0.8	2.4	3.6	2.2	2.6	2.5	6.7	1.7
Walks, exercise	1.9	0.7	1.4	1.1	0.8	2.1	4.4	3.1
Voluntary work	0.3	0.7	0.3	0.7	1.3	-	-	-
Visits to church, club etc.	-	0.4	0.2	0.9	0.2	0.5	0.4	-
Looking at something	-	-	-	1.1	0.3	-	-	0.5
Transportation	10.2	8.9	12.8	10.5	8.8	9.0	5.8	6.3
Writing letter, diary	0.3	-	1.0	0.2	0.7	0.8	1.0	-
No significant answer	1.5	0.9	4.2	2.4	2.1	4.7	5.7	5.8
No real actions	0.2	0.5	1.0	0.7	0.6	1.9	1.0	0.6

[a]AdS=Adult students, EmS=Employed students, Uem=Unemployed, ArS=Art students, DoS=Doctoral students, Alc=Alcoholics, Ret=Retired people, Con=Control group.

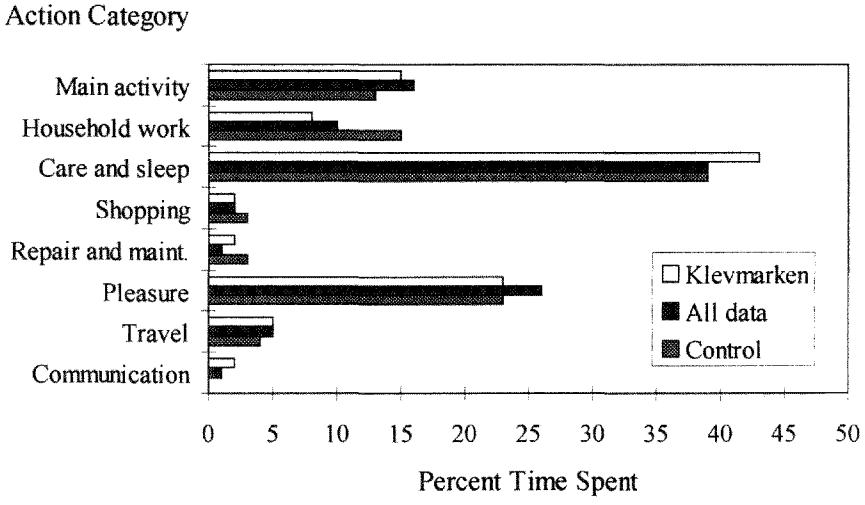

Figure 1. Percentages of time spent in different action categories for Klevmarken's group, all of our 152 subjects and the 19 subjects in our control group.

Group and action differences

Action preferences. How well, then, did people in general like to perform the different types of actions? Table 2 shows the means over all groups for Klevmarken's different action categories. A univariate ANOVA gave a level of significance $p<0.0001$ for the differences among the action categories. To facilitate reading Table 2, the different action categories are ordered in rank according to how pleasant they were. Average percentages of time allocation for the 14 hours every day are also shown. For reasons given above, sleeping was excluded from the category "Care and sleep" in our data.

Table 2
Time Allocation and Pleasantness to Perform Different Actions (All Groups)

Action category[a]	Time (%)	Pleasantness
3 Care and sleep	9.7	4.16
9 Other communication	0.5	4.15
7 Pleasure and recreation	31.7	4.12
6 Educational activity	18.6	3.91
8 Travel	9.0	3.79
4 Purchase	3.6	3.64
5 Repair and maintenance	1.3	3.63
1 Market work	9.2	3.60
10 Miscellaneous	4.2	3.53
2 Household work	12.1	3.44

[a] Klevmarken's categories.

There is a clear distinction between the first three action categories and the last seven ones, implying that people prefer to take it easy and have fun, instead of being oriented towards instrumental actions. Household work seems to be the most boring activity of all. But does this result hold if data is broken down into different groups? A two-way ANOVA gave significant differences both between groups (p=0.0001) and categories (p=0.0001), as well as a significant interaction (p=0.0088). The means are shown in Table 3.

Table 3
Pleasantness to Perform Different Actions for Each of the Eight Groups

	Group[b]							
Action-category[a]	AdS	EmS	Uem	ArS	DoS	Alc	Ret	Con
1 Market work	3.29	3.78	2.85	2.83	3.60	4.12	4.73	3.62
2 Household work	3.42	3.13	3.39	3.35	3.00	4.03	3.78	3.53
3 Care and sleep	4.33	3.98	4.11	4.11	3.85	4.58	4.08	4.13
4 Shopping	3.41	3.90	3.25	3.50	3.75	3.84	4.03	3.74
5 Repair and maintenance	1.50	5.00	3.90	3.29	5.00	4.33	3.83	3.52
6 Educational activity	3.69	4.08	3.98	4.06	3.72	4.12	4.29	3.73
7 Pleasure and recreation	4.14	4.10	3.97	3.84	3.83	4.23	4.44	3.87
8 Travel	3.78	3.73	3.53	3.69	3.65	4.14	3.96	3.89
9 Other communications	5.00	-	3.67	-	3.50	4.20	4.57	-
10 Miscellaneous	3.00	4.00	3.67	4.33	2.00	3.82	3.75	3.50

[a] Klevmarken's categories.
[b] AdS=Adult students, EmS=Employed students, Uem=Unemployed, ArS=Art students, DoS=Doctoral students, Alc=Alcoholics, Ret=Retired people, Con=Control group.

The variability in pleasantness across the eight groups varied considerably, about 1:5. A plot of mean pleasantness against between group standard deviations is given in Figure 2. There is a U-shaped trend suggesting that low attractiveness is associated with a medium level of variability. There are apparently some activities well liked by most people, some disliked by rather many and then some activities favored greatly by a minority. These may constitute specialized interests.

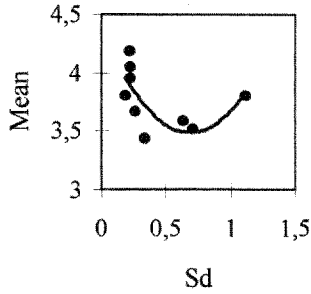

Figure 2. A plot of mean pleasantness against between group standard deviations.

Time allocation. Turning now to comparisons of the various groups of subjects, it was found that the groups differed in the amount of time spent in gainful employment or educational situations. And for obvi-

ous reasons the group of retired people spent more time relaxing than did any other group, doctoral students and employed students being worst off in this respect. The art students seemed to be the most sociable group, mingling a lot with others, while the retired people did not. Retired people instead seemed to read and write a great deal for personal satisfaction, while the employed students and the art students invested little time in this kind of activity. Not surprisingly, both the retired people and the unemployed seemed to have time to spend on hobbies, activities in voluntary organizations and the like, while the adult students probably were too busy for this.

Aspects of action and emotions. Next, the eight groups were compared in all rating and background variables. To extend these analyses, some relevant index variables were created. The stated questions refer to a questionnaire in Sjöberg and Magneberg (1987, Appendix A).

Mood is an index variable for the eight variables of mood dimensions in question 4. *Instrumental value* is an index variable calculated as the mean over all four levels of reasons of the first aspect in questions 26-29. *Consummatory value* is an index variable calculated as the mean over all four levels of reasons of the second aspect in questions 26-29. *Environmental influence* is an index variable calculated as the mean over all four levels of reasons of the third aspect in questions 26-29. *Depth of intention* is an index variable calculated as the number of reasons given for a single action in questions 26-29.

The eight groups were compared in all variables, both rating and background variables, along with the mentioned index variables, using univariate ANOVAs. There were significant differences in several variables, as specified in Table 4.

We will first summarize the differences that can be found in Table 4 between the control group and retired persons and unemployed. The differences with respect to the other groups will be discussed below with reference to a further break down of the actions.

As compared to the controls, *the unemployed* differed in time to goal, seeing the goal as more distant; in mood, being lower in mood, and in conceiving of the environment as less influential.

The retired persons, compared to the controls, gave quite a different picture. They saw themselves as acting more on their own initiative and were less likely to wish they were doing something else. They felt more free to leave the situation. They liked what they were doing better. Their stress level was lower and their mood was better.

The groups were next compared in their main activity (work or studies, including research). Separate ANOVAs were run for main activities and for all other activities combined. The groups consisting of unemployed and retired persons were not included in these analyses because they had no "main activity" corresponding to work or studies in the other groups. The results for variables in which groups differed at least at the 0.05 level of significance are given in Tables 5 and 6.

Table 4
Mean Values for Rating, Index and Background Variables for the Eight Groups Exhibiting Significant Differences

	Groups[a]								
Variable	AdS	EmS	Uem	ArS	DoS	Alc	Ret	Con	*p*
Rating variables									
Own initiative	4.04	3.84	4.23	4.10	4.26	4.27	4.42	4.13	0.004
No. of others present	5.22	3.56	2.18	2.50	2.21	1.44	1.70	1.58	0.000
Do something else	2.51	2.47	2.79	2.55	2.50	2.29	2.16	2.53	0.023
Closeness to goal	3.46	3.83	3.54	3.78	3.89	3.81	4.10	3.92	0.001
Commonness	3.74	3.69	3.71	3.65	3.78	4.00	4.02	3.88	0.049
Estimated morality	3.53	2.64	2.21	2.58	2.11	3.47	2.97	2.24	0.046
Ease to perform	4.11	4.19	4.31	3.94	4.05	4.43	4.46	4.37	0.001
Facilitate other goals	3.37	3.29	3.45	3.86	2.99	3.50	3.45	3.42	0.009
Free to leave	3.42	3.45	3.90	3.60	3.58	3.81	4.06	3.53	0.050
Pleasantness	3.90	3.94	3.82	3.85	3.72	4.17	4.21	3.83	0.004
Lack of stress	3.73	3.52	4.00	3.35	3.15	4.02	4.46	3.78	0.000
Index variables									
Mood	3.71	3.63	3.46	3.49	3.43	3.96	4.17	3.76	0.000
Environmental influence	2.77	3.02	2.28	3.17	2.99	3.12	2.64	2.84	0.046
Depth of intention	1.97	1.87	1.91	2.56	2.49	1.88	2.07	1.80	0.014
Background variables									
Educational background	1.85	1.71	1.80	2.11	3.37	1.37	1.85	1.53	0.000
Number of hours of paid work per week	2.35	34.59	.075	3.44	-	20.32	3.65	24.95	0.000
Social living	2.35	3.53	2.25	3.28	3.21	2.68	3.70	3.16	0.000
Number of children	0.45	1.41	0.10	0.61	0.89	0.32	-	1.37	0.000
Age	27.10	32.71	25.95	29.94	35.32	46.26	67.00	44.32	0.000

[a]AdS=Adult students, EmS=Employed students, Uem=Unemployed, ArS=Art students, DoS=Doctoral students, Alc=Alcoholics, Ret=Retired people, Con=Control group.
[b]1=Living with parents, 2=Living alone, 3=Living with partner, 4=Married, 5=Living in a collective community.

It is clear that the groups differed more when it came to the main activity than in other respects. There were also some interesting differences between main and other activities.

Adult students rated their main activity mainly as high in moral value. They also rated other activities high in that respect, but found such other activities more distant from the goal than the control group. There was a non significant trend towards an expression of a certain feeling of restraint in the main activity, which was performed in large groups.

Employed students were especially low in own initiative when it came to other activities than the main one. Actions other than the main activity were of particularly short duration. They were acting in rather large groups in their main activity.

Table 5
Mean Values for Rating Variables and One Index Variable for Six Groups Exhibiting Significant Differences - Main Activity

	Groups[a]						
Variable	AdS	EmS	ArS	DoS	Alc	Con	*p*
Rating variables							
Own initiative	3.56	3.80	4.38	4.29	4.03	3.84	0.006
No. of other present	11.96	4.46	1.81	2.50	1.95	1.42	0.000
Duration of action	2.77	2.39	2.45	2.69	2.29	2.06	0.043
Estimated morality	3.62	2.53	2.95	1.89	3.44	2.12	0.044
Ease to perform	3.41	3.66	2.95	3.46	4.34	3.93	0.000
Influence situation	3.21	3.72	4.31	3.98	3.33	3.43	0.003
Free to leave	2.62	3.21	3.80	3.48	3.32	2.98	0.034
Lack of stress	3.53	3.24	2.89	2.87	3.71	3.02	0.005
Index variables							
Depth of intention	2.40	2.26	3.06	2.76	1.80	2.06	0.000

[a]AdS=Adult students, EmS=Employed students, ArS=Art students, DoS=Doctoral students, Alc=Alcoholics, Con=Control group.

Table 6
Mean Values for Rating Variables and Index Variables for Six Groups Exhibiting Significant Differences - All Activities Except Main Activity

	Groups[a]						
Variable	AdS	EmS	ArS	DoS	Alc	Con	*p*
Rating variables							
Own initiative	4.18	3.86	4.00	4.26	4.32	4.19	0.015
Duration of action	2.16	1.98	1.99	2.08	2.28	2.24	0.041
Closeness to goal	3.50	3.98	3.91	4.11	3.86	4.05	0.002
Estimated morality	3.53	2.69	2.54	2.22	3.49	2.17	0.031
Facilitate other goals	3.28	3.15	3.76	2.85	3.47	3.40	0.002
Pleasantness	4.05	3.98	3.84	3.73	4.21	3.88	0.015
Lack of stress	3.83	3.64	3.49	3.28	4.13	3.93	0.001
Index variables							
Mood	3.70	3.57	3.45	3.34	3.94	3.74	0.003
Depth of intention	1.80	1.71	2.41	2.30	1.87	1.79	0.019

[a]AdS=Adult students, EmS=Employed students, ArS=Art students, DoS=Doctoral students, Alc=Alcoholics, Con=Control group.

Art students were high in own initiative and saw their main activity as something they were free to leave and could influence. They regarded their main activity as difficult. In non-main activities their stress level was high and their mood was low,

they saw goals as distant. In both kinds of activities they developed especially many steps in their analysis of intention of their main activity.

Doctoral students saw their main activity as something they could influence. They were stressed and saw obstacles to other goals especially in non-main activities. Their mood was especially low in such activities.

Alcoholics showed essentially similar profiles for main activity and leisure. They were low in stress level in the main activity. In non-main activities they rated moral value as particularly high and they also seemed to like such activities more than the control group.

Structural analysis

The variables of the questionnaire were grouped to form six indices, viz. *freedom from constraints, value, mood, emotional reactions, situational control* and *instrumental value*.

Each group was standardized separately using the individual means for each subject. The correlation matrix for these six indices, computed across all subjects and actions is given in Table 7.

Table 7
Correlation Matrix for Six Index Variables

Index[a]	I1	I2	I3	I4	I5	I6
I1	-					
I2	0.239	-				
I3	0.320	0.598	-			
I4	-0.318	-0.196	-0.194	-		
I5	-0.353	-0.013	0.074	0.435	-	
I6	0.226	0.672	0.562	-0.041	0.170	-

[a]The indices refer to those mentioned in the text, in that order.

The matrix was used as the empirical basis for testing models of the causal flow between the variables. Situational control and instrumental value were treated as exogenous and the other variables as endogenous in the models. LISREL VI was used for testing and estimation of parameters. The model given in Figure 3 was found to give a good fit, a chi-square of 4.23 with 5 degrees of freedom (p=0.51). The goodness of fit index was 0.991, the adjusted goodness of fit index 0.963 and the root mean square residual 0.023. The total coefficient of determination for structural equations was 0.665.

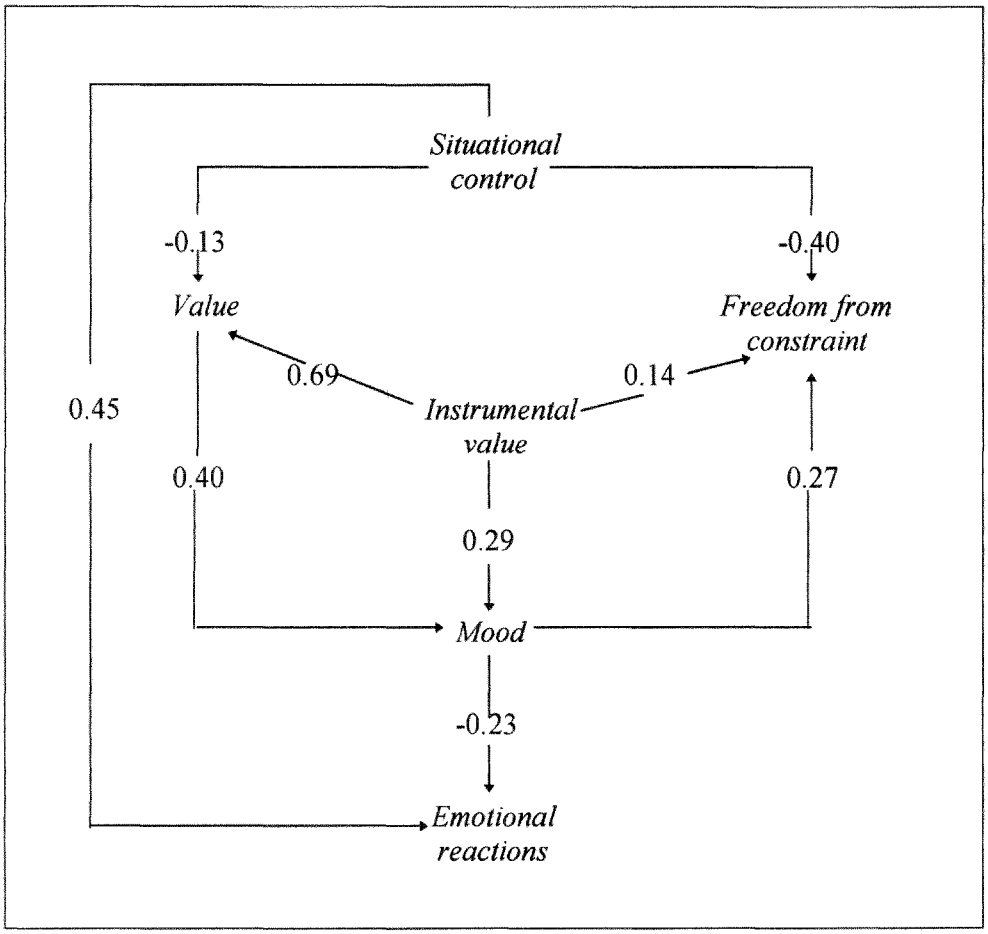

Figure 3. The LISREL model for the six index variables.

With this model, modification indices were small and all normalized residuals were less than 2. All structural parameters in Figure 3 have *t*-values >2.

The model suggests that being under the control of the situation is quite aversive, both in leading to a felt lack of freedom and in negative emotional experience. Instrumental action, on the other hand, is well liked and leads to a positive mood and to liking. It is noteworthy that the strongest direct effect of instrumentality is that produced on liking. There is also a rather strong link from liking to mood. Aversive emotions seem to be influenced both directly by environmental control and by mood.

Background variables

Education, number of hours of gainful employment per week, number of children at home, sex and age were correlated with the individual means of all rating variables. There were some significant correlations as shown in Table 8[4].

Table 8
Correlations Between Individual Means and Background Variables, N=152

Variable	Education	Work[a]	Children[b]	Sex[c]	Age
Rating variables					
Own initiative		-0.24**			0.30***
No. of others present					-0.31***
Duration of action		-0.20*	-0.18*		0.20*
Do something else					-0.32***
Closeness to goal					0.32***
Commonness					0.28***
Importance	-0.24**			0.26**	
Steering environment			0.22*		
Positive result				0.23**	
Estimated morality	-0.24**				
Rel. of moral value[d]	0.26**				
Ease to perform				0.21*	0.21*
Facilitate other goals	-0.17*				
Free to leave		-0.17*	-0.26**		0.20*
Pleasantness	-0.18*				0.30***
Lack of stress	-0.27***		-0.26**		0.34***
Index variables					
Mood	-0.19*			0.20*	0.41***
Consummatory value	-0.30***			0.23**	
Depth of intention	0.17*				
Background variables					
Hours per week of paid work			0.24**		
Social living			0.46**		0.34***
Number of children		0.24**			

[a] The number of hours of paid work per week.
[b] The number of children at home.
[c] 1= male, 2= female.
[d] 0= relevant, 1= not relevant.
*p<0.05. **p<0.01. ***p<0.001

All correlations with ratings of actions and background variables were rather week. Age and educational background seemed to be the most important aspects, while number of hours of work per week appeared to be quite unimportant.

[4] In the original article the contents of Table 8 and 9 were mixed up.

Selected aspects of actions

The present data allow a number of selected questions to be analyzed. For the present paper we have chosen to analyze the five index variables used in the structural analysis. The correlations between these index variables and rating variables are shown in Table 9.

Table 9
Correlations Between Individual Means and Five Index Variables, N=152

Variable	Mood	Emo.[a]	Instr.[b]	Consu.[c]	Depth[d]
Rating variables					
Own initiative	0.29***				
Duration of action					-0.21*
Do something else	-0.44***	0.18*	-0.17*	-0.22**	
Closeness to goal		-0.19*			
Commonness	0.38***				
Importance	0.48***		0.44***	0.61***	
Facilitating environment	0.19*		0.31***	0.25**	0.28***
Inhibiting environment		0.50***	0.23**		
Steering environment		0.35**			
Positive result	0.59***	-0.20*	0.46***	0.45***	
Estimated morality	0.25**		0.25**	0.31***	
Rel. of moral value[d]	-0.20*	-0.22**	-0.19*	-0.29***	
Ease to perform	0.48***	-0.38***			
Facilitate other goals	0.32***		0.21**	0.29***	
Influence situation		-0.28**			
Free to leave	0.29**	-0.25**			
Regrets		0.34***			
Pleasantness	0.68***	-0.22**	0.27**	0.31***	
Lack of stress	0.54***	-0.23**			-0.31***
Index variables					
Instrumental value	0.34***				
Consummatory value	0.32***		0.48***		
Environmental influence		0.30***	0.23**	0.23**	0.23**
Depth of intention			0.20*	0.17*	

[a]Aversive emotions.
[b]Instrumental value
[c]Consummatory value
[d]Level of articulation
[e]0= relevant, 1= not relevant
*$p<0.05$. **$p<0.01$. ***$p<0.001$

Some of these correlations are surprisingly strong. In previous work on mood and expectations (Appel *et al.*, 1980; Sjöberg *et al.*, 1982; Persson & Sjöberg, 1985; Sjöberg, in press) only rather weak correlations between mood and expected outcomes were found. It deserves a special note that aversive emotions did not correlate

to any noticeable extent with mood. Note also the very strong correlation between mood and liking; people seem to like being in a good mood.

The picture is rather clear. Aversive emotions tend to arise particularly when the person is forced by the situation to act and when he or she feels unfree, also when the act is difficult. Such acts are not well liked and they tend to be regretted. They promote a certain degree of reflection.

The two measures of instrumental and consummatory value, obtained by taking the mean across all levels of articulation utilized by a subject, were rather concordant. They correlated 0.48, highly significant. As can be seen from Table 9 the two value measures had very much the same profile of correlations with other variables. An exception is that consummatory value was not, as instrumental value, related to an inhibiting environment.

The picture that emerges is that both values are related to perceived environmental influence and to importance of action - and also to liking and to mood. It is striking that instrumental and consummatory value did not have an antagonistic relationship.

The number of steps utilized in analyzing depth of intention was taken as an indicant of the level of articulation or reflection. Reflection thus appears to be stimulated by (a) perception of environmental influence (b) aversive emotions. It is interesting to note that both instrumental and consummatory value also correlated with articulation, but the interpretation of that finding is less obvious.

DISCUSSION

The present results support our approach of studying the stream of behavior as it occurs. Retrospective reporting assumes the existence of a correct memory of actions. Black and Bower (1979) and Bower *et al.* (1979) showed that one tends to remember goals rather than actions, and odd deviations from routine. If goals are remembered, it may be assumed that these are defined at a more abstract level than the concrete level of action, hence retrospective reports should differ systematically from time sampling in that sense. In an interesting study, Bratfisch (1970) compared yesterday diary reports with subjective impressions of how frequently various activities were carried out. The subjects were unsuccessful students of mathematics and it was found that they grossly overestimated the category "studies" and underestimated sleep and recreation. These results may be connected with an effect of effort and pleasure on time as experienced in retrospect (cf. Frankenhaeuser, 1959), suggesting that the particular aspect of subjective time needs to be taken into account in the methodological discussion.

Interestingly enough, there is evidence that people have quite veridical memories about frequencies of behavioral acts (Hasher & Zacks, 1984; Borkenau & Ostendorf, 1987), both regarding their own behavior and that of others (Nisbett & Kunda,

1985), although there are certain biases, such as overestimating the frequency of rare actions and underestimating the frequency of common ones.

We now turn to a discussion of some of our substantial findings. The background variables accounted for only 5-10 percent of the variance of the ratings of the action variables. We conclude from these findings that the present samples of subjects cannot be entirely misleading even if they are not strictly representative of the population. The conclusion is supported by the good correspondence between our data and Klevmarken's national estimates.

A few principles can perhaps, at a first approximation, summarize some of the more interesting findings in other parts of the results. Consider first the general picture which emerges from the group differences.

Unemployed young persons, as well as art students, appeared little attracted to market work. It should be noted that the level of unemployment in Sweden has traditionally been very low, much lower than in most other industrialized nations, and that those who still are not employed may partly be in that predicament out of their own choice. The present data suggest that possibility. On the other hand, market work was not particularly popular in *any* group except among the retired people, where it might serve as a pleasant (and uncommon) change in an otherwise very free and well liked life situation. The rather low evaluation of market work is hard to reconcile with common notions as to the existence of various "needs" connected with work, or with the fact that worry about unemployment is so easily aroused. However, it may be the case that worry about unemployment is most of all worry about economical hardships or fear of developing a need for humiliating assistance from the government, rather than lack of work *per se*.

The finding of a U-shaped relationship between variability of liking and mean liking suggests that there are two quite different types of desirable actions. Some actions are well liked by almost everybody, such as relaxation, enjoying the company of good friends, etc. Other actions are quite well liked by a minority of people while others are neutral or dislike them. Stamp collection, writing a scientific paper or playing the piano are some examples. It seems likely that it is in the realm of desirable actions which give rise to a large dispersion that we find a fruitful approach to the study of interests (cf. Sjöberg, 1984).

Other findings require less comments. It is, on the whole, clear that consummatory activities receive the highest ratings and instrumental activities the lowest ones. This is not to deny that instrumental and consummatory values correlate within groups, of course. It is less clear what to conclude from the wide variation in evaluation of the category repair work and maintenance.

We next consider the more general picture emanating from the whole set of variables. The retired persons acted on their own initiative, felt free and were in a good mood, were little stressed and felt little regret. The unemployed, on the other hand, saw goals as distant, were in a bad mood and perceived little environmental influence on their action. Adult students saw their acts (when it came to main actions) as

morally justified but they also felt restrained in performing them. Employed students (and parents) were especially characterized by lack of own initiative in non-main acts and by brief acts of that kind. Art students saw the main act as something dependent on their own initiative and difficult. They had a high stress level in non-main acts, a low mood and distant goals. They tended to analyze their action in many steps. Doctoral students felt they could influence their main acts, but were stressed in non-main activities and in a low mood. Alcoholics, finally, perceived little stress in their main act and high value in non-main activities, activities they liked well.

Comparing the retired and the unemployed, both had few demands on them. But for the unemployed that is a superficial conception. They had goals but the way to reach those goals was blocked for them, hence their low mood, in contrast to the high spirits of the retired persons. Adult students were found to be restrained in their main activity, which was held by them to be morally commendable, while employed students experienced external pressure towards trivial acts of a short duration in non-main activities - probably pressures from family life. The present group of alcoholics were content with their own adherence to moral demands in non-main activities. Both art and Ph.D. students had chosen difficult main activities, generating discontent and stress in non-main activities.

A relationship between life events and mood has been documented by Stone and Neale (1984) and Stone (1987). The pleasant characteristics of family life and leisure could be seen in those data, as well as more aversive aspects of work; cf. Sjöberg's (1985a) results on the aversive properties of economically motivated acts.

Part of these findings can be summarized by means of the structural model, built upon within group correlations, and we shall do so shortly. However, the distinction between main and non-main activities necessitates one observation which is not accounted for by the model. Art students and doctoral students both illustrate groups which have chosen, on their own initiative, a very difficult main activity, carried out in a fairly non-structured manner. Art and science is everywhere and never loses its grip on them. Therefore, little is left by the way of energy and time for "trivialities". Hence the low liking for them.

Further comments can be given on the basis of the model. Environmental demands, either moral or of some other type are detrimental and lead to less liking and less perceived freedom, unless they are adhered to in a voluntary manner. In the latter case, high morality is combined with a high level of perceived freedom. Action to reach a goal is well liked and leads to a positive mood both directly and via liking. Finally, a good mood in itself seems to promote a feeling of freedom.

Kirchler (1984a; 1985) also carried out a time-sampling study of unemployed people and found that mood deteriorated immediately after lay-off, then improved for the next two months and finally declined again. Our group of unemployed persons had been without a job for at least three months. Kirchler furthermore reported that the need for power and affiliation was particularly pronounced in the unem-

ployed, a finding well in line with the present results showing the unemployed to be relatively lonely and also stressing the general need for control.

Although previous work on single acts had suggested that expected consequences are only very weakly related to emotional states (see Sjöberg, in press, for a review) the present results give a rather different picture; the relation was found to be quite strong.

The prevalence of instrumentality of actions which was found in the Sjöberg (1981) study was partly replicated here, as well as in an interesting study carried out in Italy by Rattazzi (1985) on aggressive acts. The mean ratings of instrumental, consummatory and environmental orientation of acts at four different levels of depth are given in Figure 4. Instrumental and consummatory orientations are both high, instrumental slightly higher than consummatory at the primary level. Environmental control is throughout on a low level. It was also striking in the present data that there was no conflict between instrumental and consummatory value, but a rather pronounced positive correlation between these two aspects of action. Rattazzi's results suggest, however, that such a correlation is not likely to hold for all types of action.

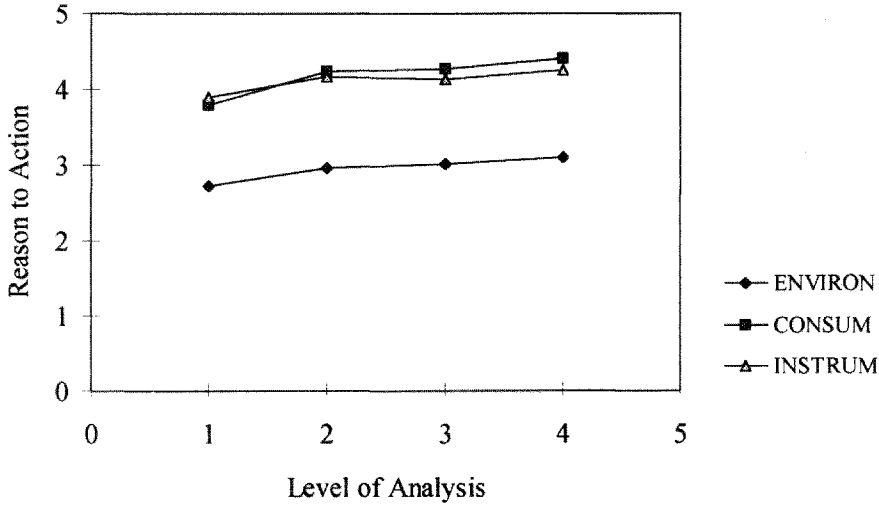

Figure 4. Means of instrumental, consummatory and environmental reasons for action on each of four levels of explanation.

The analysis of intention in several steps or levels performed in the present study is not common. It is interesting to inquire about the possible further use of such data. Is the number of steps utilized in analyzing intention a reflection of depth of articulation (i.e., the final depth arrived at in the analysis) or is it a reflection of the starting point? It is possible that some persons start at a more concrete level in defining

their goals and that they therefore find it easier and more natural to develop it in more steps.

Wegner *et al.* (1984) and Vallacher and Wegner (1987) studied how people conceive of their actions. They suggested that actions are pursued according to how they are conceived. Conceptions of action can, according to them, be at different levels of abstraction. A high level of abstraction is always preferred, but difficulties cause the person to reconsider the action in more concrete terms. They may then be influenced by suggestions about a new high level definition of their action and change it accordingly. Persons who are not skillful in performing an act would therefore be less likely to change their conceptions due to difficulties because they are already at a low level and cannot change their conceptions to a high level in a more definite way; new difficulties arise. In addition, an action may be conceived in a more concrete way when the final goal is coming closer because there is a rising concern with details involved in realizing the goal. Hence, difficult acts and acts close to the goal should be conceived at a more concrete conceptual level. If difficulty causes acts to be conceived at a lower and more concrete level they should be redefined in more steps. Also, more uncommon acts should be conceived at a lower level.

The model proposed by Wegner *et al.* should be relevant also for naturally occurring acts although it has not, to our knowledge, been tested in that case. Note that retrospective reports and time sampling may give results at different levels of abstraction when it comes to reports about acts, since one tends to remember mainly goals, not details of acts.

Econometric models of time allocation should finally be briefly mentioned. Flood (1983), citing Becker (1965), aimed at modeling intra family time allocation between men and women. Here we are only concerned about his assumptions that (a) no two activities can be carried out at the same time and (b) that work activities "do not yield any direct utility" (p. 14). Although the first mentioned assumption is strictly false, we believe that is not unreasonable as an approximation. (In our data, people would only very seldom indicate that they were carrying out two activities at the same time). However, assumption (b) should be viewed in the light of the strong correlation we have found between instrumental and consummatory values of actions. We find the assumption unlikely to be true. Work does have a utility in its own right and is not only carried out for what it leads to, at least if utility has anything to do with how people feel about what they are doing.

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A STUDY OF THE EVERYDAY BEHAVIOR OF PROBLEM DRINKERS

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ABSTRACT

This study of everyday behavior utilized a technique for reaching the subjects at any time and anywhere, asking them to report their ongoing behavior and current mood state at randomly selected points in time. The study was performed on a group of problem drinkers who volunteered to participate for one week, without changing their everyday lifestyle. Compared with a control group, the problem drinkers consumed a good deal more alcohol on considerably more occasions, resulting in deteriorated actions, a withdrawal tendency and a bad conscience. A comparison between actions performed when drinking, and otherwise, showed that drinking made the subjects feel good, but at the same time made it more difficult and less attractive to carry out what they were doing. When sober, there were no differences between problem drinkers and the controls.

Key words: Random action sampling, time-sampling, problem drinkers.

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INTRODUCTION

Research on alcohol abusers has taken several different directions: personality, prediction of relapse (Yates, Booth, Reed, Brown & Masterson, 1993), coping behavior (Wunschel, Rohsenow, Norcross & Monti, 1993) and stages of decision making (Prochaska, DiClemente & Norcross, 1992). Few studies have, however, been concerned with the naturally occurring behavior of problem drinkers.

We suggest that such studies have potential value from several points of view. Theoretically, it is important to know how problem drinkers differ, and do not differ, from normal people when it comes to the actions they carry out and the situations they encounter. Any differences are potential causative factors of abuse, or consequences of abuse, and both possibilities are important.

Practically, the detailed analysis of the actions of abusers makes it possible to draw conclusions about the consequences of abuse for a wide range of important life values. As an example, work performance has been found to correlate negatively with alcohol consumption (Blum, Roman & Martin, 1993; Streufert, Pogash, Roache, Levers, Gingrich, Landis, *et al.*, 1994).

Behavioral researchers have, in general, been slow to adopt this perspective. We have advocated a method called random action sampling and proposed that it is a potentially fruitful approach to a large number of aspects of behavior (Sjöberg & Magneberg, 1990).

We report here a study of problem drinkers and their naturally occurring behavior. It is based on self-report data. Research on alcohol abuse frequently makes use of verbal reports about behavior made by abusers themselves. The most common kind of report is concerned with aspects of drinking: amount, time and type of liquor consumed. Methodological discussions have concluded that such reports are reasonably valid (Babor, Stephens & Marlatt, 1987), although especially retrospective reports may be biased (Poikolainen, 1985) in spite of being better than traditional questionnaires (Redman, Sanson-Fisher, Wilkinson, Fakey and Gibberd, 1987), and improvement may be sought according to principles emerging from methodological work on surveys and interviews in general (Babor, Stephens & Marlatt, 1987). Improved estimates of alcohol consumptions have been claimed to be possible if prospective diaries (Poikolainen & Kärkäkäinen, 1985) or time-line methods (Sobell, Sobell, Klajner, Pavan & Basian, 1986) are used.

Current methodological work has thus been mostly concerned with alcohol consumption. However, a more broadly conceived study of naturally occurring behavior is pertinent whenever it is important to describe the life situation of a particular type of persons. The question is how such a study should be carried out. Retrospective reporting is likely to be affected by memory lapses. Other, more indirect approaches to behavior, such as personality scales, have been found to carry little generality and to say little about specific behaviors (Mischel, 1968).

Reports on behavior collected close in time to the actual event constitute a promising approach. Such reports, utilizing time sampling, have been employed by some researchers, e. g., for the study of the prevalence of instrumental action (Sjöberg, 1981), solitude (Csikszentmihalyi, 1975) or the life situation of various groups such as housewives (Brandstätter, 1981), unemployed people (Kirchler, 1985) and social workers (Magneberg, 1995). A number of different groups were studied by Sjöberg and Magneberg (1990). Time sampling data on actions can potentially be quite rich in content, sampling both cognitive and emotional aspects of experience.

In our previous work (Sjöberg & Magneberg, 1990) we developed a technique for studying naturally occurring behavior by means of a device which signals the subject, at random intervals, when he or she has to give a report on the ongoing activity. It also calls for ratings of a number of aspects of emotional and cognitive processes. In the course of developing this technique we have also collected control group data which enable us to create a reference norm with which to compare groups of special interest.

Although drinking behavior as such has frequently been studied in natural surroundings (e. g., Cahalan, Cisin & Crossley, 1969) we have found no previous work in which the whole spectrum of everyday behavior of problem drinkers has been investigated. Such studies are of potential interest for understanding reasons for abuse and also for mapping the ecology in which abusers have to fight temptations to have a relapse, whenever they try to quit (Samsonowitz & Sjöberg, 1981; Sjöberg & Samsonowitz, 1985; Sjöberg, Samsonowitz & Olsson, 1983).

In the present paper we report a study in which we have applied a time sampling technique to the study of everyday behavior of problem drinkers. The more specific purpose of the study was (a) to investigate the actions carried out by this specific kind of abusers in everyday life and to compare them with those of a control group, (b) to investigate how alcohol consumption was experienced by these abusers in their natural surroundings, and (c) to test the feasibility of the present method for studying alcohol consumption and the behavior of problem drinkers.

METHOD

Subjects

Problem drinkers. A total of 20 male subjects participated. They were selected from a group of about 60 persons who answered an advertisement in a local daily newspaper, inviting people who experienced problems with drinking to participate in a study carried out in the department of Psychology of the University of Göteborg. People who thought they consumed too much alcohol in various forms were asked to call for further information about the project. They were promised anonymity and a payment of 200 SEK for participation in the study.

The reasons for just selecting men were, first, that only about 10 percent of those who responded to the advertisement were women, which made it impossible for us to let both genders be equally represented in the experimental group. Second, research has clearly shown that female alcoholism differs significantly in many respects from the manifestations of male alcoholism (Beckman, 1975; Wilsnack, Wilsnack & Klassen, 1987). For those reasons we decided to select only male subjects for the study. Naturally it would be interesting to repeat the study with female subjects.

About half of the persons who responded to the advertisement were on sick leave because of their alcohol abuse. Some of them had been granted a pension because of inability to work. The other half, in this respect, had had few contacts with the authorities and medical practitioners. They worked and were not on sick leave.

Of the selected subjects, two did not carry out the study in the required way and were therefore excluded from the data analyses. The mean age of the remaining 18 subjects was 42 years. During the week of the test, 12 of the subjects worked full time and 6 part time. The majority had a secondary school background, but four had college education, or the equivalent, while one had a university degree.

In total, 13 subjects had on the average 2 children living at home. At the time of the test, seven subjects lived alone, while eleven lived with a partner, eight being married.

Further information was gathered to obtain a more detailed picture of the subjects' alcohol abuse. The subjects were told in advance that we would like them to answer three questionnaires after the study was completed. A selection of these data is shown below in Table 1. One subject neglected this part of the study in spite of several reminders.

A socio-economic classification of the subjects' professions, accounted for in Table 2, shows a rather even distribution among different groups in society.

Control group. From a study of 60 randomly selected subjects completed earlier the same year, all women were excluded reducing the group to half. Then all subjects who were considerably older or younger than the group of problem drinkers were omitted and, finally, all those who were unemployed. Consequently, we obtained a control group approximately matching the problem drinkers in sex, age and amount of work. It may be noted that by far the most important background variable in the present kind of data has been found to be age (Sjöberg & Magneberg, 1990). Other background variables were found to have a rather small correlations with the responses.

This procedure gave a control group of 18 male subjects with a mean age of 40 years. During the week of the test, 12 of the subjects worked full-time and 6 part-time. Five had a secondary school background, while nine had a college education, or the equivalent, and four had a university degree. In total, nine subjects had on the average 2 children living at home. At the time of the test, three subjects lived alone, while fifteen lived with a partner. Nine were married.

Table 1
Data Concerning the Abuse Pattern of Each Subject

Abuse item	Subject no.																	
	01	02	03	04	05	07	08	09	10	11	12	13	14	15	16	17	18	19
1. Drinking sessions per week	4	7	7	4	4	3	5	2	5	6	2	2	5	2	-	2	7	6
2. 12 hours continous drinking	1	1	2	1	3	2	2	2	1	3	1	2	1	2	-	1	2	2
3. Careless about meals	4	2	4	3	2	3	3	4	1	2	2	2	2	3	-	3	2	2
4. Revivers	3	1	2	3	2	2	3	3	1	2	1	2	1	2	-	2	3	3
5. Loss of memory	4	2	4	2	1	2	3	2	1	3	2	2	2	2	-	2	1	2
6. Morning tremors	2	1	2	1	1	2	2	2	1	1	2	2	1	2	-	2	1	3
7. Epileptic attacks	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	2	1
8. Hallucinations	2	1	1	1	1	1	1	1	1	1	1	1	1	1	-	1	1	1
9. Addicted to alcohol	2	1	1	1	2	2	1	2	2	3	3	2	1	1	-	2	1	1
10. Number of years of addiction	9	16	-	5	-	1	16	-	1	-	-	8	8	5	-	7	8	15
11. Alcoholism	1	1	1	1	1	1	1	1	2	2	1	2	1	1	-	2	1	1

Note. Codes, variables 1-8: (1) Never, (2) Sometimes, (3) Often, (4) Always.
Codes, variables 9-11: (1) Yes, (2) Maybe, (3) No.

Table 2
A Socio-Economic Classification of the Professions

Socio-economic category	Number
Unskilled workers	4
Untrained in service trade	4
Skilled workers	2
Low level office staff	3
Medium level office staff	3
Owner of a business enterprise	2

The control group, hence, had a somewhat higher level of education than the abusers, but this circumstance was not considered to be too problematic since, as noted above, most background variables, except age, have been found to correlate rather weakly with responses to the rating variables.

Procedure

Each subject was given 35 copies of the questionnaire, a pocket size paging receiver and written instructions stating that signals were to be received at five points of time each day for seven subsequent days. The paging receiver made it possible to reach all subjects simultaneously anywhere in Sweden by means of the FM broadcasting network. Transmitting times for the signals were selected at random, after we had divided the day into five time periods. Every signal sent to the subjects was initiated by the investigator. Subjects did not know in advance when to expect a signal.

The subjects were instructed to carry the pager from the time they woke up until the time they went to bed, with the qualification that no signals were to be transmitted before 8 a.m. or after 10 p.m. When the signal was received, the subjects were to register and evaluate what they were doing at that very moment, preferably immediately, but otherwise as soon as it was convenient. They were to use the questionnaire and answer *all* of the questions.

A numerical device on the pager showed in a coded form the consecutive order of the signal each day, along with a code showing the time the signal was transmitted. The code for the consecutive order made it possible for the subjects to realize, at an early stage, if a signal had passed unnoticed. The time-code was to be written on the questionnaire along with the time when the subject actually answered it. The pager could memorize two time codes, which could be useful in cases when the next signal came before they had been able to respond to the previous one.

The subjects were instructed to try to ignore the fact that they were carrying the pager and to carry on with everyday life as normal. The problem drinkers were specially, but cautiously, told not to change their drinking habits. When the study was completed after one week, each subject in the group of problem drinkers had a follow-up interview for one hour with the investigator and they were also given three questionnaires about their alcohol problems and asked to return them as soon as possible.

Questionnaire

The questionnaire had 32 questions, some of which had sub-questions (see Appendix B). There were two main types of questions - open questions and rating scales. In the former category, the subjects were first asked to state what they were doing when the signal arrived, and if they were doing something else simultaneously. Then they were asked about their location and what the goal of their action was. The final open question at the beginning of the questionnaire was what consequences they believed the main action would lead to. At the end of the questionnaire they had to state, if possible at four levels of abstraction, the reasons they had for performing the current action. The questions were coded according to a constructed schedule with a large number of categories for each question.

The subjects were also asked to rate several aspects of their action. The following questions used bipolar graphic rating scales:

- if the action was the result of a well thought-out decision
- how close in time the action was to the goal
- 8 scales of somatic sensation dimensions
- 9 scales of emotional dimensions
- 6 scales of cognitive dimensions
- 6 scales of performance dimensions
- estimated morality (alternatively - if the question was no relevant)
- initiative for the action
- preference to do something else
- frequency of the action
- importance of the action
- anticipated result
- ease of performing the action
- to what extent the action hindered or facilitated other goals
- if the action was regretted
- how pleasant it was to perform the action
- to what extent the action was hindered or facilitated by the surrounding situation
- to what extent the action was steered by the surrounding situation, or the situation was steered by the action
- possibility to influence the situation
- possibility to leave the situation

One question used a discrete five-category rating scale - duration of the action. Another question asked about other participants in the action. Here the number actually reported was coded if the other persons were considered significant - "class" was coded as 20 and "many" as 99.

For each of the four open questions in the last part of the questionnaire where the subjects were asked to give a "deeper" explanation of each action, they had to rate, on a bipolar graphic scale, to what extent the action was carried out:

- for what it might lead to (instrumental action - goal orientation)
- for its own sake (consummatory action - value orientation)
- because of external circumstances (situational causation - situational orientation)

All graphic rating scales were measured and read directly into a computer with a digitizer board, giving the different variables values from 1 to 99.

The post-study interview

During this interview, every subject in the group of problem drinkers was given freedom of choice to talk about anything they liked. The conversation naturally focused on their alcohol problems and their experiences during the week of the study.

They were asked about their age, education, the number of hours in paid employment during the week of the study, marital status and the number of children living at home.

During the interviews, certain specific questions became apparent. A questionnaire was compiled around these main issues and distributed to all participants, in order to provide additional information on our subjects. An account of the questions and answers involved is given in the next section.

RESULTS

Scoring

With 35 signals per subject the largest possible number of reported actions would be 1260 for both categories. Data were obtained for a total of 1148 actions, i.e., about 91 percent of the total number. The difference is accounted for below in Table 3.

Table 3
Number of Signals, Reported and Missed Actions and Reasons for Omitted Reports

Signal/action	Problem drinkers (*N*=18)	Controls (*N*=18)	Sum	Percentage
Reported actions	561	587	1 148	(91.1)
No report because of:				
Sleep	39	25	64	(5.1)
Technical problems	-	1	1	(0.1)
Unknown problems	30	17	47	(3.7)
Sum	630	630	1 260	(100)

A response rate of 91 percent must be considered quite high for a study conducted in the everyday environment of the subjects, half of whom were problem drinkers. This in turn contributes to the validity of the results. Our earlier studies have shown the same high reply frequency, a fact that clearly indicates the interest people experience when participating in this type of study, as well as the smoothness of the method chosen.

The actions were coded by two persons. In our earlier study a reliability test of the answers to the open questions was performed (Sjöberg & Magneberg, 1990). Both coders then recoded a sample of 30 actions five months later. They had formerly coded half of these themselves and half had been coded by the other coder. The within judge reliability was 0.76 and 0.60 respectively, and the between judge reliability was 0.81 and 0.61 respectively.

The post-study questionnaire

The questionnaire, compiled around the main issues which were discussed during the post-study interviews, is shown in Table 4 along with a summary of the answers.

Table 4
Questions in the Questionnaire Given to the Problem Drinkers After the Post-Study Interview and a Summary of the Answers

Question	Answer
To what extent did you participate in the study for your own sake, or because of what you could do for research?	47.8 % own sake ——————|—————— research
Do you want to reduce your alcohol consumption, or do you want to quit completely?	reduce = 9 quit = 7 no answer = 2
What significance do the following reasons have for your wish to reduce or quit? Order in rank!	psycho-social reasons (1.5) health reasons (1.9) economic reasons (2.6)
Do you smoke less when you are sober or more?	less = 12 more = 3
Try to estimate how much alcohol (40%) you consume every month.	*M* = 670 cl
Try to estimate the monthly cost for your alcohol consumption.	*M* = 1 172 SEK
Try to estimate the monthly cost for your nicotine consumption.	*M* = 403 SEK
To what extent do you think participation in this project will have negative/positive consequences for your alcohol problems?	69.1% negative ——————|—————— positive

The subjects seemed to have a slight tendency to participate for their own sake. A little less than half of our subjects wanted to quit drinking alcohol completely, while the other half only wanted to reduce their consumption. On the question as to what importance different aspects had for their standpoint, psycho-social reasons topped the ranking list. In this category we counted utterances stating the importance of a good relation to oneself, one's family and colleagues on the one hand, the ability to keep a job, driver's license and apartment on the other. In the second place came health reasons such as getting into shape again physically, fear of having a severe illness and general bodily well-being. In the third and last place came economic

reasons like being able to buy things or to travel, restoring one's economy, etc. Surprisingly, few complained about the substantial monthly cost of their abuse. They seemed to protect themselves from a bad conscience by deliberately not working out the real cost, but they probably also had to work on suppressing their bad feelings about the evident hole in their economy.

That drinking alcohol and smoking usually go together is reflected by the fact that 80 percent of the subjects who smoked said that they increased their smoking when drinking.

The mean alcohol consumption per month was about 9 bottles of hard liquor or about 22 cl liquor a day which, in turn, corresponds to 90 cl wine per day. Since our subjects did not drink in periods, and on the average four times a week, this means that they consumed this amount of alcohol day after day the whole year round. The mean cost per month estimated by the problem drinkers themselves was approximately 1 200 SEK[1]. On top of this there was a cost of about 400 SEK. for smokers. These expenditures must have constituted a severe restraint on their economic possibilities to entertain themselves in other ways, diminishing their world of experience as well as their actions.

Finally, no one thought that participation in the study would lead to any negative consequences. Instead they were slightly optimistic that it might lead to something positive regarding their alcohol consumption.

Group differences

The first analysis accounts for the consumption pattern. In Table 5 the drinking time pattern day by day both for the problem drinkers and the controls is shown.

There are two striking cyclic aspects of the drinking time pattern of the problem drinkers. First, drinking was reduced to a minimum in the morning and increased during the day. Second, drinking reached its maximum on Fridays and decreased up to Sundays. It then increased substantially on Mondays and decreased up to Thursdays. The last mentioned pattern is illustrated by Figure 1.

Drinking increased on Fridays and Saturdays for the control group, which was expected taking into account the drinking habits in our culture. The extensive drinking on Friday by the problem drinkers was also expected. The decreased drinking on Saturday and Sunday could, of course, be due to fatigue, but was probably mostly caused by diminishing access to alcoholic beverages, liqueur stores then being closed. Consequently, consumption ought to increase substantially when the liquor stores reopen on Monday morning, which the present data confirm. The following days showed a decrease in drinking and Thursday seemed to be the day of the week when they recovered, with lack of responses due to sleep and undefined reasons in 18 percent of all signals.

[1] The real cost was probably more like at least SEK 2 500 per month. It could have been considerably higher since problem drinkers often buy very expensive liquor from bootleggers during weekends when liquor stores, in accordance with the law, are closed.

Table 5
Number of Actions When the Problem Drinkers and the Controls Consumed Alcohol (One symbol (*) = 1 report of alcohol consumption)

	Problem drinkers	Time	Controls	
Monday	*	08.35		Monday
	* * * *	12.07		
	* * * * * *	13.55		
	* * * * * *	16.30		
	* * * * * * * * * *	20.40		
Tuesday	*	09.09		Tuesday
	* * * * *	13.20		
	*	16.19	*	
	* * * * * * * * * *	18.53		
	* * * * * * * * * *	20.33		
Wednesday	*	09.34		Wednesday
	* *	12.06		
	* * *	14.21		
	* * * * * * * *	18.21		
	* * * * * * * *	21.04		
Thursday	*	08.20		Thursday
	* *	13.09	*	
	* *	15.49		
	* * * * *	17.37		
	* * * * * *	21.02		
Friday	* *	10.03		Friday
	* * *	11.09		
	* * * * *	14.39		
	* * * * * * * * * *	18.51	* *	
	* * * * * * * * * *	19.54	* * *	
Saturday	* *	09.45		Saturday
	*	10.51		
	* * * * * *	13.36		
	* * * * * * *	17.44	*	
	* * * * * * *	21.52	* * *	
Sunday	*	09.58		Sunday
	* * * * *	12.49		
	* *	13.51		
	* * * * * *	18.52	*	
	* * * * *	20.32		
	Sum = 167 (29.8 %)		Sum = 12 (2.0 %)	

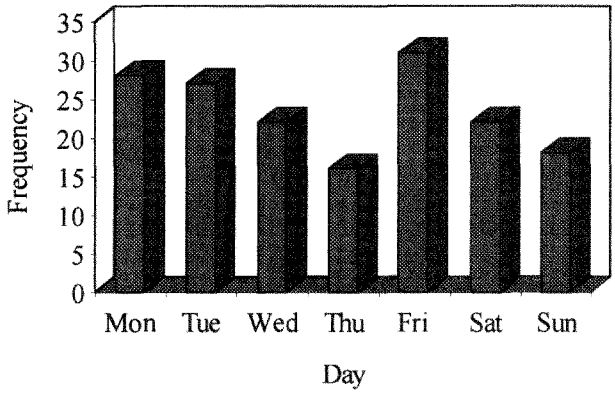

Figure 1. Number of actions for each day of the week when problem drinkers consumed alcohol.

The problem drinkers smoked in 26 percent of all actions, while the controls did so in 20 percent, and they consumed food and fruit in 6 percent and 9 percent respectively. They consumed candy in less than 2 percent of all actions. The problem drinkers had candy twice as often as the controls.

Table 6
Percentage of Locations Where the Problem Drinkers and the Controls Were When the Signals Came, Totally (T), and Divided Into Actions When Alcohol Was Consumed (A) and Otherwise (O)

Location	Problem drinkers (T=561	A=167	O=394)	Controls (T=587	A=12	O=575)
No significant answer	0.7	1.8	0.3	0.5	-	0.5
Home	49.6	67.7	42.0	41.1	58.3	40.8
Home with acquaintances	6.1	10.2	4.3	1.9	16.7	1.6
Place of work	19.5	6.6	24.9	31.2	-	31.9
Means of transportation	6.6	1.8	8.7	7.2	-	7.3
Outdoors	11.3	7.2	13.0	7.2	8.3	7.1
Place of entertainment	2.5	4.8	1.5	3.1	16.7	2.8
Club premises	0.4	-	0.5	0.3	-	0.3
Hospital	0.4	-	0.5	1.9	-	1.9
Church	0.4	-	0.5	0.5	-	0.5
Authorities	0.2	-	0.3	-	-	-
Other premises	2.5	-	3.6	5.1	-	5.2

The data allow us to analyze where our subjects were when they received the signals. The division of all actions into those performed when alcohol was or was not consumed is of special interest. The result for both groups are given in Table 6.

The problem drinkers spent more time at home, also when drinking, and more time at home with friends than the controls did. Furthermore, they spent less time at work than the controls and were even on many occasions under the influence of alcohol when working. They also seemed to be outdoors more.

Table 7
Percentage of Different Actions for the Problem Drinkers and the Controls, Totally (T), and Divided Into Actions When Alcohol Was Consumed (A) and Otherwise (O)

Type of action	Problem drinkers (T=561	A=167	O=394)	Controls (T=587	A=12	O=575)
No significant answer	0.2	-	0.3	-	-	-
Paid work	18.2	7.2	22.8	21.2	-	21.6
Voluntary work	0.4	-	0.5	2.0	-	2.1
Recreation, relaxation	15.2	26.9	10.2	10.1	33.3	9.6
Rest, sleep	3.9	1.8	4.8	1.2	-	1.2
Break, waiting	2.3	-	3.3	2.9	-	3.0
Inactive	0.4	-	0.5	0.2	-	0.2
Eating, drinking etc.	14.1	23.4	10.2	9.7	50.0	8.9
Housework	9.1	7.8	9.6	11.6	8.3	11.7
Care of children	0.2	0.6	-	0.9	-	0.9
Care of pets	1.2	1.8	1.0	0.5	-	0.5
Transportation	9.3	2.4	12.2	8.5	-	8.7
Run an errand	2.1	-	3.0	3.8	-	3.8
Walks, exercise	1.1	0.6	1.3	2.7	-	2.8
Relationship with others	8.0	12.0	6.3	6.5	8.3	6.4
Relationship with spouse, boy/girl-friend	0.5	1.8	-	-	-	-
Acquiring information	4.5	6.6	3.6	6.3	-	6.4
Personal literary activity	0.7	2.4	-	1.2	-	1.2
Personal hygiene	4.1	1.2	5.3	5.3	-	5.4
Health care	0.4	-	0.5	-	-	-
Special hobbies	2.5	0.6	3.3	2.2	-	2.3
Visit to places of entertainment	1.2	3.0	0.5	1.7	-	1.7
Association visits	0.5	-	0.8	1.0	-	1.0
Education	-	-	-	0.5	-	0.5

The differences in locations indicate that the problem drinkers did different things compared to the controls. A frequency analysis confirms this assumption. The results are shown in Table 7.

These data confirm that the problem drinkers worked less than the controls. Instead they seemed to be more engaged in activities such as recreation, relaxation and rest. In spite of the fact that the problem drinkers spent considerably more time at home, they engaged less in housework. They were more occupied with eating and drinking, and spent more time in the company of others. They were not as interested as the controls in acquiring information by means of newspapers, TV etc.

By way of summary there were some differences between problem drinkers and controls when it came to the over all pattern of actions, but these differences occurred mostly under the influence of alcohol. When sober, the actions of problem drinkers did not differ to any noticeable extent from those of control subjects.

The two groups were compared on the rating scales using univariate ANOVAs with repeated measures. Such tests require, strictly speaking, equal correlations among occasions. That condition was reasonably well fulfilled in the present data. Some time effects (day of the week and time of day) occurred but will not be reported here because they were of minor interest for the present purposes. The ANOVA results for variables in which the two groups differed at least at the 0.05 level of significance are given in Table 8.

Table 8
Means of Rating Variables for the Problem Drinkers and the Controls Exhibiting Significant Differences

Variable	Problem drinkers	Controls	*p*
Estimated morality	73.8	86.6	0.022
Importance	65.2	73.1	0.049
Positive result	72.6	80.2	0.013
Environmental influence	50.1	59.1	0.039

Problem drinkers, as compared to the control group, rated their actions as having lower moral value, being less important, and they expected less positive results. The impact of the surrounding situation, i.e. the situational causation for the action, was less than for the control group. In conclusion, the problem drinkers did not appreciate their actions as much as the control subjects.

Finally it is of interest to compare the problem drinkers and the controls in all rating variables after the exclusion of all actions when alcohol was consumed. To compare the actions in both groups, performed when alcohol was consumed, is not

very meaningful, since the number of this kind of actions in the control group was too small. The result of the former analysis was that there were no significant differences between sober actions in the two groups. This means that if the problem drinker is different from any control subject, he is so only when he is not sober. When he is sober he seems to function just like anyone else.

Within group analyses

How then did the intoxicated problem drinker differ from the sober one? What effects did alcohol consumption have on the performance of actions and the experience of oneself? To answer these questions the actions were once again divided into two categories, those performed when alcohol in some form was consumed and the remainder. Paired comparisons t-tests were computed on an individual basis. The variables showing significant differences are given in Table 9.

Table 9
Mean Values for Rating Variables for the Problem Drinkers When Alcohol Was Consumed and Otherwise

Variable	Alc.actions	Otherwise	*p*
Duration of action	2.6	2.3	0.015
Closeness to goal	63.5	72.0	0.006
Estimated morality	66.0	77.7	0.014
Importance	57.1	70.0	0.002
Positive result	65.0	76.8	0.005
Regrets	25.2	13.9	0.003
Goal-oriented	69.9	79.6	0.007
Value-oriented	71.2	80.4	0.015
Relaxed	70.0	61.2	0.020
Bodily well-being	70.0	60.0	0.009
Imaginative	60.0	53.3	0.027
Controlled	66.5	70.6	0.039
Plenty of time	77.0	68.4	0.008

The problem drinker, when drinking, became engaged in actions which took longer than otherwise, and he did not experience the conclusion of the action to be very close. His actions were perceived as less moral, less important and less positive as to expected result. He was more prone to regret his doing. His reasons for doing something became less goal-oriented as well as less value-oriented. But the problem drinker obviously felt more relaxed and bodily well when drinking. He was more imaginative, as well as more impulsive and less stressed.

To see if this pattern is representative in general for people who drink, one would like to perform the same type of analysis on the control group. However, actions involving alcohol consumption only occurred in 12 cases, which precludes a satisfactory comparison between the two kinds of actions.

The analysis in question is, however, possible to perform satisfactory if one includes all of the 59 subjects in our total control group. As before, paired comparisons *t*-tests were computed on an individual basis. There were significant differences in several variables, given in Table 10.

Table 10
Mean Values for Rating Variables for the Total Control Group When Alcohol Was Consumed and Otherwise

Variable	Alc.actions	Otherwise	*p*
Duration of action	2.8	2.3	0.000
Own initiative	59.8	73.8	0.019
Do something else	18.0	35.8	0.000
Ease to perform	88.0	80.0	0.000
Pleasantness	84.9	73.4	0.000
Facilitating environment	81.6	67.0	0.000
Influence situation	79.6	73.0	0.003
Free to leave	76.9	67.8	0.041
Alert	75.0	61.6	0.002
Healthy	84.8	79.1	0.019
Relaxed	86.2	73.8	0.000
Bodily well-being	82.3	70.5	0.000
Friendly	79.0	72.3	0.001
Happy	81.3	71.3	0.000
Calm	77.7	70.8	0.001
Confirmed expectations	70.9	64.0	0.011
Sociable	80.8	61.4	0.000
Plenty of time	82.6	66.5	0.000

The normal person, when drinking, was also engaged in actions, which took longer than otherwise. But except for that fact he experienced his actions quite differently from the problem drinker. It is true that his initiative was low, but he did not want to do anything else. The immediate action was easy and pleasant to perform. The surrounding situation had a facilitating effect, and he felt that he could influence the situation or was free to leave, at the same time.

Furthermore, the normal person, when drinking, felt alert, healthy, relaxed as well as bodily well. He also felt friendly, happy and calm. Finally, he felt confirmed in his expectations, as well as sociable and unstressed.

DISCUSSION

Some major findings can be summarized as follows. The problem drinkers had quite a different drinking time pattern as compared to the controls. The latter consumed alcohol mostly on weekend evenings. Problem drinkers were found to drink at any time of the day, any day of the week, but mostly they drank during the evenings and weekends. The problem drinkers in the present study consumed alcohol 15 times as frequently as the control group. Temporal patterning of drinking is a well established phenomenon (Orcutt & Harvey, 1991).

The effects of alcohol on the problem drinkers were rather clear-cut. They did report some pleasant body feelings and relaxation, along with experiences of being more imaginative and impulsive. But they also showed signs of a bad conscience when drinking and their assessment of the actions performed were less positive. Hence drinking seemed to be an ambivalent experience for them. Perhaps the reason why problem drinkers frequently deny any positive effects of alcohol when they are sober has to do with this ambivalence.

Normal drinkers, on the other hand, obviously did not have a bad conscience when drinking, nor did their actions show any other signs of negative effects. Like the problem drinkers, they experienced pleasant body feelings and a good mood. The picture is quite non-contradictory, without the ambivalence mentioned above, for the problem drinkers.

A very interesting result of the study is the fact that the problem drinkers did not differ very much from control subjects when sober. Why, then, did they drink so frequently, about 15 times more often than the control group? This is, of course, a main issue and difficult to answer (cf. Baker, Morse & Sherman, 1986). A closer examination of the results in Table 9 and Table 10 shows that the problem drinkers and the normal people differed in their reactions to alcohol consumption. If a division is made between external variables, i.e. aspects of the specific action, and internal variables, i.e. aspects of a persons' inner experience of him- or herself, this difference can be readily demonstrated, as in Figure 2 below.

The non-addicted persons obviously experienced an overall increase in subjective well-being when drinking. The problem drinkers, on the other hand, experienced an increased well-being with respect to the internally oriented dimensions, but at the same time a decreased well-being with respect to the externally oriented variables. Part of the reason for this difference may be that problem drinkers had consumed more alcohol at any given point in time. Data do not allow for a check of this.

But why would the problem drinker be inclined to suffer considerable disadvantages in what could be attributed to "the external world", in exchange for considerable advantages in what could be attributed to "the internal world"? Either the appreciation of the latter is higher than that of the former, or the mere diminishing of

the gap between the experienced quality of these two worlds is the real aim for the problem drinker when drinking.

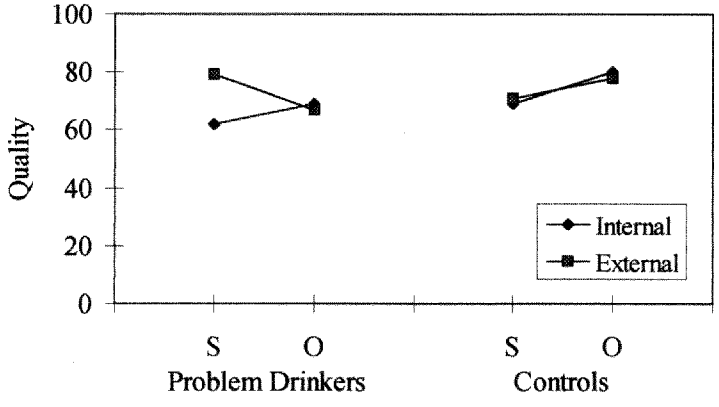

Figure 2. Experienced quality for external and internal variables for the problem drinkers and the controls, when sober and when not.

The tendency to exhibit withdrawal symptoms when drinking was confirmed in the post-study interview, when many subjects described how they shut themselves off from the outside world when drinking. It was also reflected by the fact that the problem drinkers spent more time at home, with friends, or outdoors, than the controls did, who spent more time at work. Furthermore, normal people seemed to experience the surrounding situation as facilitating their actions when drinking, whereas the reasons of the problem drinker for doing something while drinking became less directed towards the surrounding situation.

Many studies of alcohol abuse show that the abuser is inclined to ignore negative long-term effects of drinking, in return for positive short-term effects. This non-rational way of reasoning is reflected in Table 11, where the six largest categories of consequences for different actions are shown.

When the problem drinkers actually drank alcohol, the uncertainty of the consequences of their ongoing activity was reduced and they were more inclined to declare that their action had no obvious consequence, whatsoever, except for the expectation of a future unavoidable hangover. The number of different categories necessary to classify the stated consequences of actions under the influence of alcohol was reduced to half, indicating a less nuanced experience of the outside world. In short, the problem drinkers seemed to begin to function on a more primitive level under the influence of alcohol.

A cursory look at Table 7 may give the impression that the problem drinkers did not differ much from controls when it came to allocating time to various activities. However, this is a somewhat misleading impression. By adding leisure and con-

sumption activities and clearly instrumental activities in two broad categories we find some interesting differences. As can be seen in Figure 3, leisure and consumption of food and drink was increased by some 45 percent in our sample of problem drinkers as compared to controls, while instrumental activity was decreased by 17 percent. The difference between the problem drinkers and controls thus was most pronounced when it came to consumption and leisure, and less in terms of instrumental action.

Table 11
Percentages of Reported Consequences of the Action for the Problem Drinkers When Alcohol Was Consumed and Otherwise (f>0.05%)

Consequence	Alc.action	Otherwise
Do not know	5.6	12.4
None	37.3	18.7
Physiological effects	4.3	5.8
Self-evident result	1.2	6.9
Hangover	6.2	0.3
Generally positive result	12.4	16.1
	67.0 %	60.2 %
Number of categories used:	25	51

It may also be noted that the general trend towards instrumentality of actions, noted by Sjöberg (1981) was present also in the group of problem drinkers being studied here. These were not skid row alcoholics, and it may naturally be quite a different matter with a group of advanced drinkers. The ecology produces restraints on what behavior must be performed without considerable sanctions. Norms and social surroundings guide actions to a large extent. Persons who are not institutionalized or social outcasts must therefore conform to a frame of reference which is only partly elastic.

It should also be noted that we have no measure of the quality of instrumental action to compare the two groups. It may well be the case that the problem drinkers were worse off than it appears here because of less efficient actions. Alcohol is well-known for its detrimental effects on cognitive functions, measured by means of psychological tests (Parsons & Farr, 1981) or described in cognitive psychological terms (Steele, Southwick & Pagano, 1986).

If there are consistent personality traits characteristic of problem drinkers, they do not seem to affect action as conceived here. Since personality tests have consistently failed in discriminating problem drinkers from other groups, we conclude that problem drinkers differ from controls by drinking more, but not in any other consistent way.

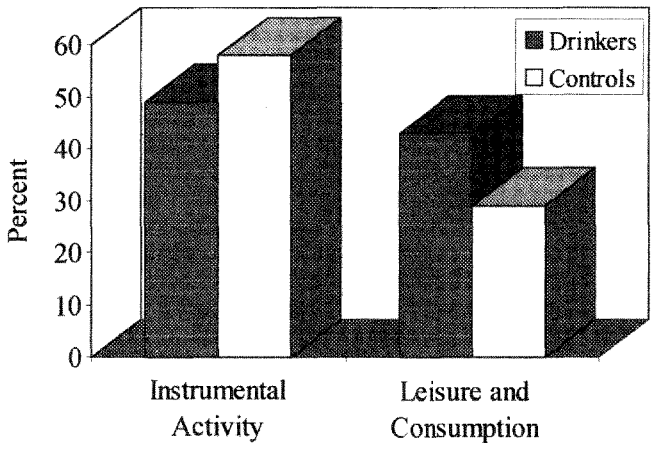

Figure 3. Percentages of time spent by the problem drinkers and the controls in instrumental actions and in leisure and consumption.

In summary, we found our present group of problem drinkers to be characterized by experiencing positive effects of alcohol at the same time as guilt feelings. Alcohol consumption seemed in some respects to be detrimental to the efficiency of their actions. At the same time, the problem drinkers appeared to be no different from controls while sober, neither in terms of the distribution of actions across categories, nor in terms of how actions were rated on our scales. When drinking the problem drinkers seemed to have a tendency to withdraw from the external situation and to function in a more primitive or hedonistic way, which is reflected by an increased emphasis on leisure time and consumption of food and drink instead of instrumental actions. Thus, alcohol consumption seemed to function as a reward in the form of well-being, with a foreseeable price of distorted contact with reality.

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A STUDY OF THE EVERYDAY BEHAVIOR OF SOCIAL WORKERS

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ABSTRACT

This study of ordinary, everyday behavior is one in a series, using a special technique for reaching the subjects at any time, anywhere. The present study was performed on a group of social workers, working in different social welfare offices, who volunteered to participate for one week, without changing their everyday lifestyle. Compared with a control group, the social workers seemed quite aware and motivated by their actions, but under rather severe strain in their life as a whole. Whether this was due to a difficult working situation or can be explained in terms of different background factors is an intriguing question. It is tentatively concluded that the working situation was the most likely explanation.

Key words: Random action sampling, time-sampling, social workers.

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INTRODUCTION

In previous studies (Magneberg & Sjöberg, 1995; Sjöberg & Magneberg, 1990), a method was developed for studying naturally occurring behavior, using a special technique. A small portable device signals the subject at random intervals, when he or she has to give a structured report on the ongoing activity. In the course of developing this method, control group data have also been collected, which makes it possible to create a reference norm with which to compare groups of special interest. In the present paper, this method is applied to the study of the everyday behavior of a group of social workers.

The reasons for choosing social workers were first, the interest in carrying out this kind of study on an occupational group and second, to choose a group of skilled workers said to have a particularly difficult working situation. On the matter of the wearing out of this group of employees, there is abundant literature, both within this country and abroad. The syndrome of *burnout* is thoroughly documented, among others by Maslach (1982), Pines (1982) and Marklund *et al.* (1984).

Most studies on social workers are based on personal interviews. Göransson *et al.* (1983) found a high prevalence of somatic and psychological disorders, along with disturbances in the private life-sphere. However, the validity of the method is many times questionable, since social workers interviewed by a social worker are expected to go along with even an unpronounced purpose of the study and give the interviewer desirable answers.

The purpose of the present study was to investigate the actions carried out by social workers in their everyday life, both during working hours and leisure time, and to compare them with those of a control group. This was done in order to see whether the general apprehension of the professional difficulties of this group of workers could be verified or not. The method chosen was randomly selected action samples, made possible by the application of the mentioned technique.

METHOD

Subjects

Social workers. A total of 20 subjects participated. A letter was sent out to 100 social workers in the municipality of Göteborg. They were all working with individual and family care in different social welfare offices. The letter described the background and the purpose of the study and asked them to consider participation. To fill the quota, 29 persons had to be phoned. Five of these said 'no' immediately, while four were interested but, for different reasons, unable to participate.

There were 17 women and 3 men in the final group. This distribution was representative for the whole population of social workers in Göteborg. One woman was

excluded from the data analysis, because of exceptional events during the week of the study. The mean age of the remainder was 37 years. Of these, 13 worked full-time and the rest part-time, between 50 and 75 percent. Five persons attended classes a couple of times a week. All subjects had a college degree. The majority, or 12 subjects, had children living at home. At the time of the study, 7 subjects lived alone, while 12 lived with a partner, 9 being married.

Control subjects. From a study of 60 randomly selected subjects completed one year earlier, 19 subjects were chosen to match the social workers. They were reasonably matched with respect to gender, age, hours of work per week, number of children and marital status. In short, they were matched in all important background variables, except education. It may be noted that the most important background variable, in the present kind of data, has been found to be age (Sjöberg & Magneberg, 1990).

This procedure gave a control group of 16 women and 3 men, their mean age being 38 years. During the week of the study, nine subjects worked full-time and the rest part-time, between 35 percent and 80 percent. With the exception of one subject who studied part-time, none of the group attended classes. The educational background of 10 subjects was comprehensive school, 4 had upper secondary school or equivalent, and 5 had a university degree. In total, 13 subjects had children living at home. At the time of the study, 7 subjects lived alone, while 12 lived with a partner, 10 being married.

Procedure

Each subject was given 35 copies of the questionnaire, a pocket size paging receiver and written instructions regarding five points of time each day for seven subsequent days. The paging receiver made it possible to reach all subjects simultaneously anywhere in Sweden by means of the FM broadcasting network. Transmitting times for the signals were selected at random, after we had divided the day into five time periods. Every signal sent to the subjects was initiated by the investigator. Subjects did not know in advance when to expect a signal.

The subjects were instructed to carry the pager from the time they woke up until the time they went to bed, with the qualification that no signals were to be transmitted before 8:00 a.m. or after 10:00 p.m. When the signal was received, the subjects were to register and evaluate what they were doing at that very moment. Preferably immediately, but otherwise as soon as it was convenient, they were to use the questionnaire and answer *all* of the questions.

A numerical device on the pager showed, in a coded form, the consecutive order of the signal each day, along with a code showing the time the signal was transmitted. The code for the consecutive order made it possible for the subjects to realize, at an early stage, if a signal had passed unnoticed. The time-code was to be written down on the questionnaire along with the time when they actually answered

it. The pager could to memorize two time codes, which could be useful in cases when the next signal came before they had been able to respond to the previous one.

The subjects were instructed to try to ignore the fact that they were carrying the pager and to carry on with their everyday life as normal. When the study was completed after one week, the pager and the questionnaires were returned.

Questionnaire

The questionnaire had 32 questions, some of which had sub-questions (see Appendix B). There were two main types of questions - open questions and rating scales. In the former category, the subjects were first asked to state what they were doing when the signal arrived, and whether they were doing something else simultaneously. Then they were asked about their location and what the goal of their actions was. The final open question at the beginning of the questionnaire was what consequences they believed the main action would lead to. At the end of the questionnaire they had to state, if possible at four levels of abstraction, their reasons for performing the action stated. These open questions were coded according to a constructed schedule with a large number of categories for each question.

The subjects were also asked to rate several aspects of their action. The following questions used a bipolar graphic scale:

- if the action was the result of a well thought-out decision
- how close (timewise) the action was to the goal
- 8 scales of somatic sensation dimensions
- 9 scales of emotional dimensions
- 6 scales of cognitive dimensions
- 6 scales of performance dimensions
- estimated morality (alt. - if the question was not relevant)
- own initiative
- preference to do something else
- frequency of the action
- importance of the action
- anticipated result
- ease of performing the action
- if the action hindered or facilitated other goals
- if the action was regretted
- how pleasant it was to perform the action
- to what extent the action was hindered or facilitated by the surrounding situation
- to what extent the action was steered by the surrounding situation, or the situation was steered by the action
- possibility to influence the situation
- possibility to leave the situation

One question used a discrete five-category rating scale - duration of the action. Another question asked about other participants in the action. Here the number actually reported was coded if the other persons were considered significant - "class" was coded as 20 and "many" as 99.

Ratings were to be made for each of the four open questions in the last part of the questionnaire, where the subjects were asked to give a "deeper" explanation of each action. They were asked to rate, on a bipolar graphic scale, to what extent the action was carried out:

- for what it might lead to (instrumental action - goal orientation)
- for its own sake (consummatory action - value orientation)
- because of external circumstances (situational causation - situational orientation)

All graphic rating scales were measured and read directly into a computer with a digitizer board, giving the different variables values from 1 to 99.

RESULTS

Scoring

With 35 signals per subject the highest possible number of reported actions would have been 1 330 for both categories. Data were obtained for a total of 1 238 actions, i.e. about 93 percent of the total number. The difference is accounted for in Table 1.

Table 1
Number of Signals, Reported and Missed Actions and Reasons for Omitted Reports

Signal/action	Social workers (*N*=19)	Controls (*N*=19)	Sum	Percentage
Reported actions	634	604	1 238	(93.1)
No report because of:				
Sleep	7	20	27	(2.0)
Technical problems	15	21	36	(2.7)
Unknown problems	9	20	29	(2.2)
Sum	665	665	1 330	(100)

The frequency of reported actions was quite satisfactory. A reply frequency of 93 percent must be considered very high for a study conducted in the everyday environment of the subjects. This, in turn, contributes substantially to the validity of the results. Earlier studies of the same type have shown the same high reply frequency, a fact that clearly indicates the interest people experience when participating in this type of study, as well as the smoothness of the method chosen.

The omitted reports can be divided into three categories of approximately the same size: sleep, technical problems and unknown problems. These categories might conceal actions the subjects were unwilling to report, like sexual acts, going to the bathroom, hangover, etc. However, the general impression is that the subjects' answers were fairly honest and accurate. These missing actions were so few that they do not jeopardize the interpretation of the results of the study in any way.

The median delay before answering a questionnaire after a signal was 24 minutes for the social workers and 14 minutes for the controls. The longer delay for the social workers might indicate difficulty to leave the ongoing activity.

The actions were coded by two persons. In an earlier study a reliability test of the answers to the open questions was performed and found to be satisfactory (Sjöberg & Magneberg, 1990).

Table 2
Percentage of Different Actions for the Social Workers and the Controls

Type of action	Social workers	Controls
Paid work	28.9	24.3
Break, waiting	2.2	2.5
Housework	12.0	11.4
Eating, drinking etc.	9.6	11.1
Rest, sleep	1.7	0.7
Personal hygiene	2.5	2.6
Personal beautification	0.6	1.0
Care of children	4.7	1.0
Confined to bed	0.2	-
Running an errand	2.5	3.6
Health care	0.5	0.3
Repair work	0.3	3.0
Education	0.9	1.0
Acquiring information	1.7	3.0
Relationship with others	9.3	9.6
Relationship with partner	0.2	-
Recreation, relaxation	4.3	6.4
Places of entertainment	0.6	0.8
Special hobbies	1.4	2.3
Walks, exercise	1.7	2.1
Voluntary work	0.2	1.8
Club, church activities	0.2	0.8
Looking at something	0.5	-
Transportation	10.1	8.8
Writing letter, diary	0.8	0.7
No real actions	2.1	1.3
No significant answer	0.2	-

Group differences

The first aspect to be explored is what the subjects were actually doing when the signals arrived as compared to controls. The outcome of a frequency analysis is given in Table 2.

The social workers were more often engaged in paid work actions than the controls. The social workers seemed to take care of children more often, which is natural in light of the fact that there were twice as many small children in this group as in the control group.

The different action categories in Table 2 can be grouped and ordered according to the categories utilized by Klevmarken (1986). A more aggregated comparison between the groups is shown in Table 3 along with time allocation and mean ratings of how pleasant it was to perform these different categories of actions. A two-way ANOVA gave significant differences both between groups (p=0.019) and categories (p=0.001). There was also a significant interaction (p=0.001).

Table 3
Time Allocation (T) and Pleasantness (P) to Perform Different Categories of Actions

	Social workers		Controls	
Type of actions[a]	T[b]	P[c]	T[b]	P[c]
1 Market work	31.1	63.0	26.8	69.5
2 Household work	12.9	61.7	11.4	54.6
3 Care and sleep	19.4	77.5	16.4	81.2
4 Shopping	3.0	71.3	4.0	67.5
5 Repair and maintenance	0.3	11.5	3.0	73.5
6 Educational activity	2.7	69.9	4.0	77.2
7 Pleasure and recreation	18.3	68.9	24.0	80.1
8 Travel	10.1	68.9	8.8	69.4
9 Other communication	0.8	75.4	0.7	70.2
10 Miscellaneous	2.2	69.1	1.2	59.3

[a]Klevmarken's categories.
[b]Percentage of 14 hours.
[c]Mean.

In addition to the above mentioned differences, this level of aggregation makes it more easy to see that the social workers spent less time in activities like 'pleasure and recreation' and 'repair and maintenance' than the controls. As in earlier studies (Sjöberg & Magneberg, 1990), subjects in both groups seemed to prefer activities like 'care and sleep' and 'pleasure and recreation' to activities more oriented towards sustaining a proper standard of living. Both groups scored 'educational activities' quite high. The social workers disliked 'market work' more than the controls, while both groups obviously experienced 'household work' as rather unattractive.

The next analysis shows the different locations of the social workers and the controls when they received the signals. The result is presented in Table 4.

Table 4
Percentage of Locations Showing Where the Social Workers and the Controls Were When the Signals Came

Location	Social workers	Controls
Home	35.3	41.5
Place of work	35.6	32.3
Means of transportation	5.2	6.5
Home with acquaintances	5.4	3.0
Outdoors	8.6	6.6
Place of entertainment	2.9	3.0
Hospital	1.0	0.7
Club premises	0.2	0.3
Church	-	1.0
Authorities	0.2	-
Other premises	5.4	5.1
No significant answer	0.2	-

The most evident outcome of this analysis is that the social workers spent less time in their own home and more time at work than the controls did. This is consistent with the fact that the social workers worked on the average 35.8 hours per week, compared to the controls who worked 32.2 hours. Otherwise, there were no sizable differences.

There are many possible aspects of an action, the consequences being one. Both groups used roughly the same number of categories to describe them, around 60, but the distribution was somewhat different, as can be seen in Table 5. Only the largest categories are accounted for.

Table 5
Percentage of Different Types of Reported Consequences of the Action for the Social Workers and the Controls (f>.05%)

Consequence	Social workers	Controls
Do not know	2.4	6.0
None	2.6	14.4
Physiological effects	10.5	7.1
Self-evident result	13.4	8.2
Good order	5.0	2.8
Work well-done	1.1	5.2

The consequences most frequently experienced by the social workers, ranked in order, were: a self-evident result of the action, to have physiological effects and to contribute to the creation or maintenance of good order. The controls on the other hand usually did not experience any consequences, but if they did the those were also regarded as a self-evident result of the action and to have physiological effects.

An analysis of the consumption-pattern shows that the consumption of alcohol in various forms was very low for both groups. There was also a low consumption of candy in both groups. The social workers smoked in about 3 percent of all actions, compared with 17 percent for the controls. Both the social workers and the controls ate food and fruit to some degree, 12 percent and 9 percent of the time respectively.

Summing up, the picture that begins to emerge of the social worker in this study is one of a fairly hard-working middle-age person with relatively young children. Maybe this last fact is one reason why he or she did not smoke very much. The consequences of different actions appeared to be self-evident to them. The social workers resemble the group of employed students with small children in a previous study (Sjöberg & Magneberg, 1990).

To continue, the most interesting explorative analysis usually is to compare the individual means of all rating variables with those of the control group. Thus, the social workers and the controls were compared in this respect using *t*-tests. The results for variables in which the two groups differed at least at the 0.05 level of significance are given in Table 6.

Table 6
Means of Rating and Index Variables for the Social Workers and the Controls, Exhibiting Significant Differences - All Actions

Variable	Social workers	Controls	*p*
Rating variables			
Duration of action	1.97	2.18	0.019
Relaxed	60.5	71.8	0.002
Bodily well-being	61.4	73.3	0.016
Friendly	61.7	71.4	0.007
Happy	60.9	70.4	0.007
Calm	62.7	74.1	0.002
Secure	62.3	70.2	0.045
Sociable	56.7	65.1	0.023
Plenty of time	54.1	61.5	0.025
Own initiative	68.2	74.6	0.037
Facilitating situation	63.1	70.3	0.036
Index variables			
Affect	59.1	66.0	0.044
Performance	58.2	64.2	0.038
Depth of intention	2.75	2.11	0.029

First, the social workers were engaged in actions which took a shorter time as compared to the controls. Furthermore, they were more tense and had more unpleasant body sensations than the controls. They felt more angry, sad, nervous and insecure. They experienced themselves as more unsociable and stressed than the controls. They did not perceive themselves as the initiator of the actions in which they were involved to the same extent as the controls, and they did not conceive of the surrounding situation as particularly facilitating.

The variable 'Affect' is an index variable for the nine scales of emotional dimensions, while 'Performance' is an index variable for the six scales of performance dimensions. The variable 'Depth of intention' was calculated as the number of reasons given for a single action. As can be seen in Table 6, the social workers were not in as good a mood as the controls, nor did they find it as easy to perform their actions. But they were able to give more reasons as to why they were performing a particular action than the controls could.

After having studied the overall picture, the next natural step would be to see if a division of actions performed during working hours and leisure time can alter the somewhat negative impression of the life-situation of the social workers. In the first category all actions were counted that were performed between 8:00 a.m. and 6:00 p.m. Monday to Friday. The second category consisted of the remainder. This procedure divided the total number of actions in both groups into two categories of actions of approximately equal size.

Thus, the two groups were compared in all rating variables for actions performed during working hours and leisure time respectively, using *t*-tests. The variables that differed significantly are given in Tables 7 and 8.

Table 7 shows that during working hours the social workers were not as close to the completion of the action as the controls. As for the rest, the significant variables were the same as before, except for the duration of the action.

Table 8 shows that during leisure time the social workers were engaged in actions which took a shorter time, as compared to the controls. Even if both groups felt better during their leisure time, the social workers were still more tense, had more unpleasant body sensations and were not as calm as the controls. Both groups became less concentrated during their leisure time, but this applied to the social workers to a larger extent than the controls. Both groups thought they could influence their situation more during their leisure time, but the increase was not as big for the social workers as for the controls. During working hours, both groups felt equally unfree to leave the situation, but this freedom increased more for the controls during leisure time, than for the social workers. The number of reasons for an action decreased for both groups when working hours were over, but the social workers could still give more reasons for their actions.

The social workers differed less from the controls during leisure time. The number of significant variables was reduced to half.

Table 7
Means of Rating and Index Variables for the Social Workers and the Controls, Exhibiting Significant Differences - Actions Performed During Working Hours

Variable	Social workers	Controls	*p*
Rating variables			
Closeness to goal	61.1	70.6	0.006
Relaxed	55.7	68.6	0.003
Bodily well-being	58.5	71.0	0.016
Friendly	59.1	71.4	0.001
Happy	58.2	70.9	0.001
Calm	59.7	73.3	0.001
Secure	59.8	69.9	0.011
Sociable	56.4	65.3	0.027
Plenty of time	46.0	54.9	0.020
Own initiative	63.6	76.3	0.003
Facilitating situation	60.7	68.0	0.038
Index variables			
Affect	57.1	65.7	0.014
Performance	58.5	64.3	0.022
Depth of intention	2.83	2.17	0.031

Table 8
Means of Rating and Index Variables for the Social Workers and the Controls, Exhibiting Significant Differences - Actions Performed During Leisure Time

Variable	Social workers	Controls	*p*
Rating variables			
Duration of action	2.07	2.33	0.032
Relaxed	65.9	75.3	0.018
Bodily well-being	66.6	76.1	0.043
Calm	65.9	74.9	0.020
Concentrated	54.8	63.8	0.048
Influence situation	71.5	79.6	0.049
Free to leave	61.0	72.6	0.013
Index variables			
Depth of intention	2.68	2.03	0.036

The importance of the educational background as an explanatory factor is not controlled for so far. Since a control group matched in all relevant aspects is out of the question here for practical reasons, one might get closer to the importance of education by comparing the social workers with a control group matched only in the level of education.

Education seems to be, next to age, the most important background variable (Sjöberg & Magneberg, 1990). How then would the social workers differ from a group of control subjects, all having a university degree? Unfortunately, there were only 11 persons with this type of educational background in the pool of control subjects. A comparison on the same three separate levels as earlier using *t*-tests is presented in Table 9.

Table 9
Means of Rating Variables for the Social Workers and a Control Group With Comparable Education

Variable	Social workers	Controls	*p*
All actions			
Closeness to goal	65.0	73.8	0.030
Courageous	58.7	51.6	0.049
Estimated morality	80.9	90.3	0.027
Do something else	33.4	43.6	0.044
Actions Performed During Working Hours			
Closeness to goal	61.1	71.8	0.015
Friendly	59.1	66.3	0.033
Own initiative	63.6	72.2	0.042
Surroundings were steered	42.6	48.4	0.049
Estimated morality	80.0	90.8	0.012
Actions Performed During Leisure Time			
Active	63.9	56.4	0.042
Common	62.2	70.3	0.038

In the control group, different academic professions were fairly well represented, from engineers to a psychologist. There were 6 men and 5 women and the mean age was 42 years. At the time of the study, 5 of them had children at home, their mean age being 13 years.

Surprisingly enough, the social workers did not seem to differ as much from these control subjects with comparable educational background as they did compared to the first control group, the number of significant variables being reduced to a third. Taken over all actions, the social workers seemed to have more doubts of the morality of their actions, although their ratings were rather high. They did not want to do

anything else and they were obviously more courageous than the average academic person. They were not as close to the goal as the controls.

However, these significant variables do not give a coherent picture. When some 60 (independent) variables are compared in an analysis of this type, on the average at least 3 variables should have a level of significance $p<0.05$, even if there are no real differences. In spite then of the significant variables in Table 9, one is more inclined to infer, at this stage of analysis, that there were no real differences between the social workers and this control group with comparable educational background.

A comparison between the actions performed during working hours and leisure time helps to clarify the picture. The differences during working hours were increased, while they decreased during leisure time, indicating that educational background is not a potent explanatory factor for these differences, but rather the working situation of the social workers.

If a division is made between *external variables*, i.e., aspects of a specific action, and *internal variables*, i.e., aspects of a person's inner experience of him/ herself, an interesting shift takes place. Compared to the first control group, most significant variables were of the internal type, while compared to the second control group, most significant variables were of the external type. This means that compared to people who differed only in educational background, the social workers had a lower experience of themselves, while this was not true when it came to people with comparable educational background only. Here instead aspects of the action were predominant. During working hours, the social worker seemed to be more unfriendly than control subjects.

In summary, the social workers were worse off than the first control group, both when it came to his/her internal experiences, and external evaluation of his/her action. This was especially true during working hours. Furthermore, the social workers scored lower on external variables as compared to the second control group during working hours. However, during leisure time there were practically no differences. The social workers were more active and did more uncommon things. This might indicate that unhappiness in one's work is compensated for by more thrilling leisure activities. In spite of this, or on top of it, the social workers seemed to be well aware of the reasons for their actions.

Thus, the social workers, as well as other academics, seemed quite aware and motivated by their actions, but suffered from strain in their life as a whole, especially in their working situation.

DISCUSSION

The subjects in this study should be considered representative for the category of social workers who meet with a number of clients all day long, either in the social welfare office or in the clients' home.

The purpose of this study has not been to analyze the different tasks of a social worker on the whole, but to see if a more objective approach to the experience of everyday life of a social worker can reveal the alleged burnout syndrome. In order to achieve this aim, a comparison was made to one control group matched in most relevant background factors except education, and one control group matched only in education.

To begin with, the social workers differed from the first control group by having different jobs. Further, they differed in some background aspects. The facts that the social workers had a higher education, worked more and had more small children than the controls, might be enough to explain why they were more aware of their actions, as well as under more strain in their everyday life. The importance of these different background variables are to be discussed next, in reference to the analysis presented by Sjöberg & Magneberg (1990).

First, the social workers had a significantly higher education. This variable was shown by Sjöberg and Magneberg (1990) to correlate with low rated importance of the action, low estimated morality, low relevance of moral evaluation, low facilitation of other goals, low pleasantness to perform the action, more stress, low consummatory value of the action, developing more steps in the analysis of intention and with low mood.

The connection between education and subjective well-being is not very clear-cut. Campbell's (1981) data suggest that education had an influence on subjective well-being in the U.S. during 1957 to 1978. However, the effects of education on subjective well-being do not appear to be strong (Palmore, 1979; Palmore & Luikart,1972) and seem to interact with other variables such as income (Bradburn & Caplovitz, 1965). Several studies have found that there is no significant effect when other factors are controlled (Clemente & Sauer, 1976; Spreitzer & Snyder, 1974; Toseland & Rasch, 1979-1980), and several studies have indicated more positive effects for women (Freudiger, 1980; Glenn & Weaver, 1981; Mitchell, 1976). After suggesting that education has some positive influence, Glenn and Weaver cautioned that "the estimated effects on males of all levels of education and of college on both genders are especially likely to be disappointing" (p.34). Campbell's (1981) analysis suggests that although education may serve as a resource for the person, it may also raise aspirations and alert the person to alternative types of life.

In his study of life-quality Tåhlin (1983) excluded education from further analyses as an explanatory factor of importance. Allardt (1975) found no correlation between education and happiness. Bernow (1987) on the other hand found a negative

correlation between educational level and experienced life quality. It is the view of the present author that although the impact of education is not straightforward, educational background must be considered as a significant background factor, yet to be further investigated.

Besides the higher education of the social workers, they worked about 10 percent more per week than the controls. However, this difference was not significant. The number of hours of work per week is known to correlate with a low level of own initiative, short duration of the action and lack of freedom to leave the situation.

Finally, the social workers had twice as many small children as the controls. The number of children is known to correlate with short duration of the action, steering environment, lack of freedom to leave the situation and more stress. Since small children demand much care, it is natural that parents of small children experience the mentioned aspects to a higher extent than parents of older children.

The higher number of small children of the social workers corresponds to the well known fact that people with a high education tend to postpone reproduction. In this respect, our subjects were much like those in the study conducted by Göransson et al. (1983). Being parents of small children might also explain why the social workers did not smoke very much, but it is also true that academics smoke less than other groups of people.

This leads to the tentative conclusion that the high level of education of the social workers explains the high awareness of why they were doing different things. This corresponds to the result from the group of doctoral students in the earlier cited study (Sjöberg & Magneberg, 1990). Concerning the stress level, the social workers experienced much stress during working hours, but not during leisure time, implying that the cause of this stress is to be found in their work and not in their small children or their high education.

Compared with the control group matched in all relevant background variables except education, the social workers seemed to live a more unpleasant life. Not even during leisure time did they experience life as enjoyable as the control subjects during working hours. This last statement is illustrated in Figure 1.

In the figure, the mean of relevant variables in Tables 7 and 8 were taken as a measure of experienced quality of life. No attempts were made to map the objective side of this concept, i.e. how high the material standard for each group were. Even though the concept of quality of life is hard to define in an unambiguous way, as noted by Tåhlin (1983), the objective side must be considered beside the point here.

However, compared with a control group matched only in the educational background, the life of the social worker did not seem quite as bad. The difference in experienced quality of life during working hours remained, but disappeared during leisure time.

In conclusion, the social workers in this study seemed to be quite aware and motivated, but under considerable strain compared to control subjects. Working full-time in a profession requiring rather advanced education, and at the same time

having small children, might be enough to explain this strain. But after having ruled out different possible explanatory factors, the most likely explanation of this strain is the job situation of the social workers.

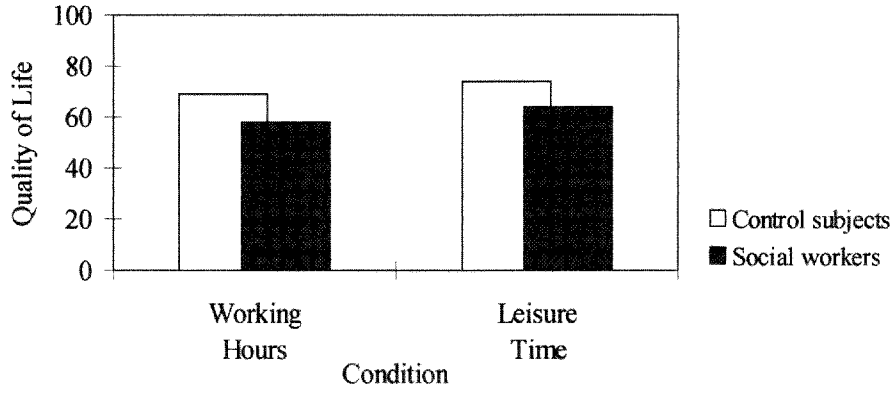

Figure 1. Experienced life-quality of the social workers and the control group matched in all relevant background variables except education.

But what about the job situation then? The rapid flow of demanding clients and the insufficient time and means for meeting these demands, is usually said to put the social worker into a very frustrating conflict. According to Göransson et al. (1983), this dilemma affects the whole everyday experience of life, workday as well as holiday, resulting in somatic, psychiatric and private disturbances. The lack of coherence between demands and resources in the working situation might be the most potent explanation of the strain. This is at least what many of the social workers argued quite spontaneously in connection with carrying out the reported study.

Göransson et al. placed most emphasis in their study on an extensive analysis of the working environment after an introductory presentation of some relevant background variables, along with experienced symptoms on three aggregated levels: somatic and psychological disorders and disturbances in private life. The proportion between the genders in their study is comparable to the proportion in the current study, but the mean age was some five years lower. They did not give any information about the number of children, but it seems as though their young social workers had few children.

Although three rating scales were used to measure stress, no means were reported by Göransson et al. The prevalence of different types of disorders were reported, but the lack of data from control subjects substantially diminish the value of these figures. The present study confirms that social workers do have more unpleasant body sensations and are more tense than people in general, but they are not more often ill. They did not have difficulties in concentrating, nor were they more tired than people in general. They were not more indifferent, but they were more stressed and sad.

Even if the investigators in the cited study have referred to some well known psychological researchers to legitimatize the use of interviews as the best method in this type of studies, it is the view of the present author that one must go about it in a more structured way. The results in the present study confirm some of the results in the cited study and disconfirm others. Since the investigators justified the extensive analysis of the working environment of their social workers with reference to different types of disorders among these employees, the least one can expect is a thorough and statistically significant documentation of these disorders.

Summing up, this study has not been able to fully verify that the working situation is the most significant explanatory factor for the strained life-experience of a social worker, but this is highly likely. There are indications of dislike for the tight working schedule, resulting in lowered self-experience and difficulties to perform the different working tasks. A heavy workload and having small children might also explain some of the strain of the social workers in this study. The influence of educational background is unclear, but people with higher education seem to have less fun. Perhaps people with special personality traits tend to go for higher education. It makes them feel more important and gives them more responsibility, but it does not seem to make them happier. Another possibility is that of economical strain, felt by many academically educated people in Sweden who face a combination of high taxes, low salaries and payment of mortgages on loans acquired during the many years of study.

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THE EFFECT OF ELECTRONIC SURVEILLANCE ON NICOTINE MISUSE AND EVERYDAY BEHAVIOR

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ABSTRACT

The present study of the everyday behavior of nicotine misusers, belongs to a series of studies using a special technique for conveniently reaching the subjects at any time, anywhere and to sample their everyday behavior. One purpose of the study was to help a group of habitual smokers to quit smoking. Another purpose was to study how nicotine misusers differ from matched non-smoking people, and to obtain a psychological profile of them before and during their attempts to quit. The belief was that an experimental design with a moral contract and electronic surveillance would facilitate the smokers' attempts to quit. The results in terms of terminated and reduced smoking were very satisfactory and the method of random action sampling made detailed descriptive and explorative analyses possible.

Key words: Nicotine, nicotine misuse, smoking, smoking cessation.

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INTRODUCTION

Much research has been conducted on addictive behavior. The field of research is large and important, and further development is highly desired. Tobacco smoking is no longer regarded as just a habit. During the two most recent decades of research it has come to be regarded as a drug addiction (APA, 1994). Most tobacco users (87 percent) appear dependent on tobacco (Woody *et al.*, 1993).

In previous studies, a method has been developed for studying naturally occurring behavior, using a special technique (Magneberg, 1995; Magneberg & Sjöberg, 1995; Sjöberg & Magneberg, 1990). A small portable device signals the subject at random intervals, when he or she is to give a structured report on the ongoing activity. In the course of developing this method, control group data have also been collected, which makes it possible to create a reference norm with which to compare groups of special interest.

Beside the desire to develop a method of studying people's ordinary behavior, the aim so far was to describe different interesting categories of people, what they were doing with their time, how they perceived their actions, how they experienced themselves and the surrounding situation, etc. Interestingly enough, many participants commented on the benevolent influence of this self-reflecting activity on their lives. Furthermore, the studies carried out on groups of problem drinkers and alcoholics indicated a therapeutic effect, without this having been our intention. The experiences from all these previous studies were combined in more applied studies, with the objective to induce different categories of misusers to control their misuse.

A distinction is emphasized between use, misuse and abuse of nicotine. This distinction will be further clarified in later sections. The distinction is important, because it gives more nuance to the way of looking upon any use of psychoactive substances, and may deepen our understanding of addictive behavior.

Cigarette smoking is considered the major preventable cause of ill health and premature morbidity in developed countries. During 1992 around 30 percent of the Swedish population were daily and 7 percent were temporary consumers of tobacco, including both smokers and snuff dippers[1] (Ramström, 1993). The cost in terms of loss of GNP in 1991 was estimated to approximately 10 billions SEK (Ramström, 1991). Smoking is a persistent pattern of behavior that is primarily initiated in adolescence (Evans & Raines, 1982). Some researchers claim that it would be more effective to prevent the acquisition of smoking in adolescents than to deal with an addictive habit pattern in adults (Murray, Luepker, Johnson & Mittelmark, 1984). Many researchers have devoted their time and effort to try to understand the social dynamics of adolescent smoking. The peer environment has been found to be a crucial factor in adolescent smoking behavior (van

[1] A person who practices the oral use of moisted snuff.

Roosmalen & McDaniel, 1992). However, experience seems to point in the direction that it is easier to help adults to quit the use of nicotine, than it is to prevent the use of nicotine in adolescents.

While studying important predictors concerning the acquisition of smoking habits is of great importance for preventive reasons, research concerning how best to help those already caught in this habit is much more essential. Even though nicotine abstinence is a physical reality, looking upon tobacco use as a *disease* would place addictive behavior outside control of the free will, releasing the addict from moral responsibility. This biochemical model has not been very successful in the treatment of alcoholics so far and will probably not be very helpful in treating habitual smokers. Tobacco dependence is as present actually classified by WHO as a *mental* disorder

The supply of different kinds of aid in smoking cessation are abundant in Western societies. The models of nicotine addiction and the methods for behavioral modification are numerous. The criteria for addiction are found in, e.g., APA (1994). The criterion for a good method is that it works. But, even if smoking rates are declining and quit rates are rising, research on behavioral approaches to smoking cessation seems to be stagnant (Shiffman, 1993). According to Shiffman, treatment innovations will probably only come from research that aims at fundamentally new insights regarding smoking behavior and smoking behavior change. However, one should keep in mind that along with the professionally facilitated change of addictive behavior, there are self-initiated behavior changes in great numbers.

An important development in this type of research focuses on stages and processes of change (Prochaska, DiClemente & Norcross, 1992). The main problem for a smoker is to take and carry through the decision to quit, and thereafter to maintain this intention and to avoid relapses. Sjöberg & Samsonowitz (1978) have studied the influence of emotional stress on volitional breakdowns and the importance of coping techniques for avoiding relapse. Some researchers have concentrated on trying to understand those situations in which a relapse is likely to occur (Brownell, Marlett, Lichtenstein & Wilson, 1986). The best predictor of relapse is a previous lapse (O'Connell, 1985).

Another rather promising trend in addictive research is reversal theory. It is a relatively new general theory of motivation, emotion and personality (Cook, Gerkovich, Potocky, O'Connell, 1993). It has been successfully applied to a variety of health relevant behaviors including smoking cessation (Potocky, Gerkovich, O'Connell & Cook, 1991). Reversal theory postulates that a person, at any given time, is in one state from each pair of a few well-defined bistable, mutually exclusive psychological states. The person then reverses between the two states quite frequently. Reversals occur instantaneously and involuntarily. Relapses are more prone to occur within some states than others.

Network therapy is both psychodynamic and behavioral and emphasizes the social context of the addiction. The therapeutic effects of support from family members and peers on rehabilitation from alcohol and drug dependence in relapse prevention has been documented (Galanter, 1993).

The main purpose of the present study was to create a facilitating experimental environment for a group of habitual smokers where to cease smoking, and to study the influence of nicotine misuse on everyday behavior. Similar data from a control group were also collected. The method used is called Random Action Sampling (RAS), and is made possible by the application of modern technology.

METHOD

Subjects

Smokers. A total of 44 subjects participated, half males and half females. They were selected from a group of people answering advertisements in two daily news-papers. The advertisement briefly described the study and invited smokers to contact the investigator for further information. Those who did so got involved in a three-stage letter procedure, in which they at one occasion had to fill in and return a questionnaire with relevant background and smoking-related questions. Since considerably more smokers responded than could possibly participate in the study, due to limited resources, it was possible to select a rather representative and well motivated group of participants. They were representative of the population as a whole concerning some important background variables, except for a few restrictions presented below, and they were well motivated both to participate in the study and to quit smoking. To give the people in the experimental group an identity, the study was called 'Projekt Storrökare'[2].

The general criteria for participation were:

1. *Age*: 30-55 years
2. *Work*: preferably full time - not on sick leave

The special criteria for participation were:

1. *Smoking*: only cigarette misuse: 20-40 cigarettes per day
2. *Other misuse or abuse*: not medicine or alcohol
3. *Physiological/psychological problems*: nothing serious
4. *Will to quit smoking*: very strong

Some common background variables for the smokers are shown in Table 1 along with relevant variables concerning the smokers smoking habits. The variables are first presented below:

[2] 'Project heavy smokers.'

Age The number of years
Education (1) = Comprehensive school (or equivalent)
(2) = Upper secondary school - " -
(3) = University degree - " -
Work The number of hours of work per week
Living (1) = With parents (3) = With a partner (5) = In a group
(2) = Alone (4) = Married
Children The number of children

Start-age The age at which smoking began
Smoke-free The number of smoke-free years since the debut
Attempts The number of attempts to quit smoking
Cigarettes The number of cigarettes per day

Table 1
Some Relevant Background Variables for Male and Female Smokers

Background variable	Male Subject no.																				
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	Mean
Age	31	32	34	36	39	39	40	41	41	42	43	45	45	45	47	50	50	52	52	53	42.9
Education	2	2	3	2	2	3	2	2	1	3	2	1	2	3	3	2	1	2	2	2	2.1
Work	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40.0
Living	4	3	3	4	2	3	4	2	4	4	4	4	4	3	3	4	2	4	2	4	-
Children	1	0	0	3	0	2	2	1	2	2	2	2	1	4	1	3	1	2	2	2	1.7
Start-age	15	14	14	15	14	18	18	20	15	16	25	10	15	14	17	22	18	22	20	15	16.9
Smoke-free	0	0	0	2	0	0	0	5	0	0	0	0	4	0	0	0	0	0	0	9	1.0
Attempts	2	2	0	3	1	2	1	9	2	2	3	0	3	0	4	1	4	1	1	2	2.2
Cigarettes	30	25	30	30	30	20	30	20	23	30	25	25	20	35	20	35	23	35	25	30	27.1

Background variable	Female Subject no.																				
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Mean
Age	30	32	33	34	37	38	39	39	39	42	42	42	43	43	45	45	46	47	49	50	40.8
Education	2	1	3	2	1	3	3	1	1	2	3	2	3	2	1	2	2	2	3	3	2.1
Work	40	30	40	40	40	40	40	25	40	40	40	40	40	40	40	40	40	40	40	40	38.8
Living	2	3	2	2	2	3	2	3	2	2	4	2	4	2	2	2	4	2	2	2	-
Children	0	2	0	1	1	2	1	2	1	2	2	2	1	1	3	0	1	5	1	4	1.6
Start-age	15	15	15	13	15	15	18	15	14	11	20	16	17	15	20	13	25	16	22	20	16.5
Smoke-free	0	1	1	3	0	2	1	0	0	0	0	1	1	0	0	0	0	9	0	0	1.0
Attempts	3	1	2	1	1	0	6	5	1	1	3	1	1	1	1	3	2	2	0	2	1.9
Cigarettes	23	25	25	23	30	20	25	30	30	20	25	25	30	25	28	33	30	25	30	40	27.1

Two women and two men did not carry out the study in the required way and were therefore excluded from the data analyses. This exclusion did not depend on their possible failure to quit smoking, but on the fact that they stopped filling in the questionnaires during the first phase with the paging receiver. In earlier studies, the average number of drop-outs has been just less than one per group of 20 subjects.

Control group. A total of 40 subjects participated, half males and half females. They were selected from a group of people answering advertisements in two daily newspapers in Göteborg. The advertisement briefly described the study and invited those who were interested to contact the investigator for further information. Those who did so got involved in a three-stage letter procedure, in which they at one occasion had to fill in and return a questionnaire with relevant background questions. Considerably more people responded to the invitation than could possibly participate in the study. There were no difficulties to select a rather representative and well motivated group of participants. They were representative of the population as a whole concerning some important background variables, except for a few restrictions presented below, and they were well motivated to participate in the study. Two subjects, one woman and one man, did not perform the study in the required way and were therefore excluded from data analyses. They were replaced with two matched control subjects from another pool of control subjects. In contrast to the experimental groups, the subjects in the control group were offered a tax-free fee of 250 SEK. To give the people in the control group an identity of their own, the study was called 'Projekt Göteborgare'[3].

The general criteria for participation were:
1. *Age*: 30-55 years
2. *Work*: preferably full time - not on sick leave

The special criteria for participation were:
1. *Misuse or abuse*: not medicine, nicotine or alcohol
2. *Physiological/psychological problems*: nothing serious

The same background variables as before are presented for the control subjects in Table 2.

To a reasonable extent the control group was matched with the group of smokers with respect to gender, age, education, hours of work per week, number of children and marital status. One woman and one man did not carry out the study in the required way and were therefore excluded from the data analyses. To equalize the number of subjects in the control group with that in the group of smokers, two persons, one man and one woman, meeting the general and special criteria mentioned above, were selected from another pool of control persons,

[3] 'Project Gothenburgers.'

available from earlier studies. Special attention was paid to the background variables to match the two groups even closer. No one in the control group smoked and the average consumption of alcohol was less than one glass of wine per week. The smokers drank a little less than two glasses.

Table 2
Some Relevant Background Variables for Male and Female Control Subjects

Background variable	Male Subject no.																				
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	Mean
Age	30	32	33	33	35	35	39	39	42	45	46	46	47	48	48	50	52	52	53	55	43.0
Education	3	2	3	2	2	3	2	1	2	1	2	2	2	1	2	1	3	3	1	1	2.0
Work	40	40	40	40	40	40	40	40	40	40	40	40	40	32	40	40	40	40	40	40	39.6
Living	3	2	4	3	4	3	4	4	2	3	2	4	4	2	2	4	4	4	4	4	-
Children	0	2	1	2	2	0	1	1	0	0	3	3	1	1	3	3	2	2	2	4	1.7

Background variable	Female Subject no.																				
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Mean
Age	30	31	32	33	34	35	37	37	38	38	40	42	45	45	48	50	50	52	53	54	41.2
Education	3	2	1	3	3	2	2	2	3	3	1	3	3	1	1	3	1	2	3	2	2.2
Work	40	32	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39.6
Living	3	4	2	3	4	2	2	4	2	2	3	2	4	3	2	4	2	3	2	3	-
Children	0	2	0	0	1	0	0	0	0	0	3	1	3	3	2	2	1	2	1	0	1.1

Note. For a more extensive explanation of the different background variables see page 129.

Background differences

It is of course of the greatest importance that the smokers and the controls did not differ in any important aspect other than their smoking habits. To see whether the group of smokers differed from the group of control subjects concerning the background variables, in which they were supposed to be matched, the groups were compared in this respect using *t*-tests. The results are shown in Table 3.

As can be seen, there were no significant differences between the experimental group and the control group when it came to the chosen background variables. Although those common background variables do not have a great impact on behavior in general, it is comforting to know that they are under control. Differences between the groups will now more likely be attributable to the fact that one group was abusing nicotine and the other one was not.

Table 3
Means of Background Variables for the Smokers and the Controls

Background variable	Smokers	Controls	*p*
Age	41.8	42.1	0.85
Education	2.1	2.1	0.88
Work	39.4	39.6	0.67
Children	1.6	1.4	0.30

Note. For a more extensive explanation of the different background variables see page 129.

Procedure

The smokers participated for three weeks and the controls for one week. They were all given a pack of questionnaires, a pocket size paging receiver and written instructions. A moral contract to carry out the project, no matter how successful or unsuccessful they were, was established with each smoker by a handshake.

The experimental group received three signals per day and the control group five signals. The paging receiver made it possible to reach all subjects simultaneously anywhere in Sweden by means of the FM broadcasting network. Transmitting times for the signals were selected at random, after dividing the day into an adequate number of time periods. Every signal sent to the subjects was initiated by the investigator. Subjects could not know in advance when to expect a signal.

The subjects were instructed to carry the pager from the time they woke up until the time they went to bed, with the limitation that no signals were to be transmitted before 8:00 a.m. or after 10:00 p.m.. When the signal was received, each subject was to register and evaluate what he/she was doing at that very moment. Preferably immediately, but otherwise as soon as it was convenient, they were to use one questionnaire and answer *all* of the questions it contained.

A numerical device on the pager showed, for each signal, a code for the consecutive order of the signal, along with a code showing the time the signal was transmitted. The code for the consecutive order made it possible for the subjects to realize, at an early stage, if a signal had passed unnoticed. The time-code was to be written down on the questionnaire along with the time when the subject actually started to respond to it. The pager could memorize two time codes, which could be useful in cases when the next signal came before they had been able to respond to the previous one.

The subjects were instructed to try to ignore the fact that they were carrying the pager and to carry on with everyday life as normal. During the first week of the study, the smokers were instructed to maintain their smoking habits as always. At the beginning of the second week they were to quit smoking completely for the rest of the study and hopefully for the rest of their lives. As a support they received a letter the day they were to quit with 'best wishes'. The smokers were

informed of the necessity to develop personal ways of dealing with the unavoidable abstinence symptoms and the desire to smoke.

After three weeks and when this phase of the study was completed, each subject in the group of smokers had a follow-up interview for one hour with the investigator. Thereafter, to follow up changes during the following year, five questionnaires were sent to this group, with a mean interval of about 12 weeks. Finally, a six-year follow-up was conducted to evaluate the long-term net results of the study.

Questionnaire

The questionnaire had two parts (see Appendix B & B1). The first 32 questions were intended to map the current situation and the action carried out at the time of the signal. There were two main types of questions - *open questions* and *rating scales*. In the former category, the subjects were first asked to state what they were doing when the signal arrived, and if they were doing something else simultaneously. Then they were asked about their location and what the goal of their action was. The final open question at the beginning of the questionnaire was what consequences they believed the main action would lead to. At the end of the questionnaire they had to state, if possible at four levels of abstraction, the reasons they had for performing the action stated. The questions were coded according to a constructed schedule with a large number of categories for each question.

All graphic rating scales were measured and read directly into a computer with a digitizer board, giving the different variables values from 1 to 99.

The objective of the concluding questions of the questionnaire was to ask some smoking-related questions. The first of these questions asked about how many cigarettes they had had so far during the day. The open question at the end of the questionnaire asked about strategies for handling the craving for nicotine and there were some additional scales. The last page for the controls had questions of general interest, possibly useful for future investigations.

The computer program mentioned above was written prior to the present studies and could not, due to inadequate resources, be altered to suite the questions on the last page of the questionnaire. That is why a bipolar discrete rating scale with five categories was used.

The post-study interview

During this interview, every subject in the group of smokers was given freedom of choice to talk about anything they liked. The conversation naturally focused on their misuse problem and their experiences during the weeks of the study.

RESULTS

Scoring

With 3 signals per day for 21 days, the number of reported actions from each subject in the experimental group should be 63. With 5 signals per day for 7 days, the number of reported actions from each subject in the control group should be 35. However, some reports were missing. The total number of reported actions, and the reasons for omitted reports, can be seen in Table 4.

The frequency of reported actions for the smokers was satisfactory (87.7 percent) and very satisfactory for the controls (94.6 percent). The high reply frequency contributes substantially to the validity of the results. In previous studies (Magneberg, 1995; Magneberg & Sjöberg, 1995; Sjöberg & Magneberg, 1990;) the average frequency of reported actions was 91.2 percent. This indicates the interest people have when participating in this type of study.

The difference in reply frequency was expected. The control subjects did not have any misuse or abuse problems and volunteered for the sake of a good cause. They were expected to carry out the investigation in the best of manners. The smokers on the other hand were not expected to control life as elegantly as the controls. The frequency of reported actions can therefore be considered as a coarse, but nevertheless reliable assessment of the ability to master everyday life.

Table 4
Number of Signals, Reported and Missed Actions and Reasons for Omitted Reports

Signal/action	Smokers (*N*=40)	Controls (*N*=40)	Sum	Percentage
Reported actions	2 210	1 324	3 534	(90.2)
No report because of:				
Sleep	104	30	134	(3.4)
Technical problems	82	27	109	(2.8)
Unknown problems	124	19	143	(3.6)
Sum	2 520	1 400	3 920	(100)

The omitted reports can be divided into three categories of about the same size: sleep, technical problems, and unknown problems. The last category might conceal actions or states the subjects were unwilling to report, like sexual acts, going to the bathroom, having a hangover, etc. However, the general impression is, as in previous studies, that the subjects answers were fairly honest and accurate. The missing actions were relatively few and do not jeopardize the interpretation of the results of the study in any crucial way.

The median time-lapse between signal and questionnaire response was 13 min for the smokers and 14 min for the controls, while the means were 34 and 36 min respectively. Only a few percentages of the reported actions were without specification as to what time the filling in started. The medians are somewhat higher than those of earlier studies, while the means are closer. However, the two groups did not differ significantly in these aspects.

The actions were coded by one experienced coder. In an earlier study (Sjöberg & Magneberg, 1990) a reliability test of the answers to open questions was performed and found to be satisfactory.

Within group analyses

To cease smoking is for most people a bewildering experience, bound to affect their perception of themselves and the external world. After a few failures, they know what disastrous suffering they are up against.

Even though all smokers in this study were strongly motivated to quit, the first thing one might wonder is how well they succeeded to keep their promise to stop smoking the day they were supposed to. Question no. 33 in the questionnaire asked about how many cigarettes they had smoked so far during the day. The mean of the last reported action per day was 17.8 cigarettes for the first week, but only 1.1 and 1.4 for the second and third week respectively.

Two subjects failed rather flagrantly, but still only smoked half of what they usually smoked. Of course, the mean number of cigarettes smoked each day must have been higher than the numbers presented above, since some time elapsed from the last signal until bed-time. The mean time when the last signal was transmitted was 7:40 p.m.. However, it is the magnitude of the differences that are of real interest here, not the absolute numbers. Figure 1 shows the average numbers of cigarettes smoked when the last report was made, for each day of the three weeks.

As can be seen in the figure, the consumption of cigarettes was fairly even during the first seven days. For the remaining 14 days the number of cigarettes smoked at the time of the last report each day was on an almost constant low level, the average being <2 cigarettes per day. This shows that the smokers really lived up to their promises in an a highly commendable way.

The experimental design permits two important questions to be analyzed and the coming presentation in this subsection will revolve around these:

1. How did the smokers experience themselves and the world when smoking compared with when not smoking, during the first week of the study when they still were allowed to smoke?
2. How did the smokers experience themselves and the world during the second and third week of the study, when they no longer were allowed to smoke, compared with the first week?

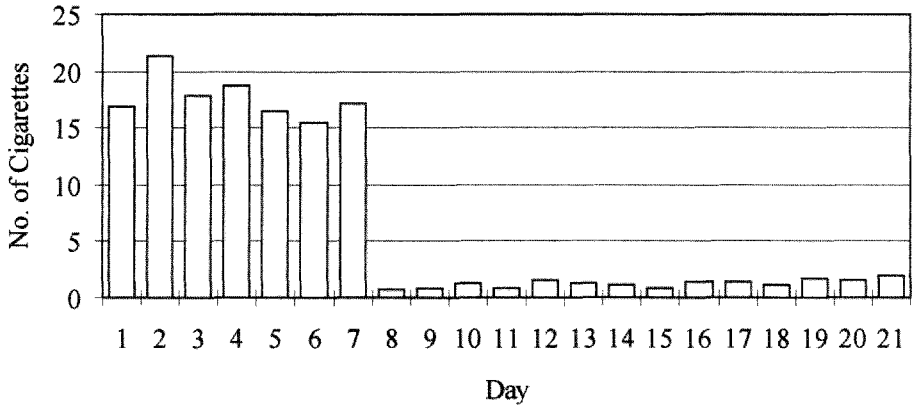

Figure 1. Mean numbers of cigarettes smoked when the last report was made, for each day of the three weeks.

Consequently, a division was first made of the actions during the first week of the study, between those performed during smoking and otherwise. Paired comparisons *t*-tests were computed on individual means, to eliminate the intra-individual variability. The means of variables, which differed at least at the 0.05 level of significance, are given in Table 5.

Table 5
Means of Rating Variables During the First Week When Smoking and When Not, Exhibiting Significant Differences

Variable	Smoking	Not smoking	*p*
Not hungry	60.5	53.1	0.040
Not surprised	53.6	59.4	0.037
Active	57.9	67.7	0.017
Efficient	51.9	61.1	0.020
Thought-out decision	58.3	67.9	0.012
Estimated morality	64.4	80.6	0.001
Importance	56.3	68.9	0.010
Positive result	64.7	75.9	0.005
Regrets	17.4	10.4	0.034

While smoking, the smokers were less hungry, more surprised, less active and less efficient. Further, the actions of the smokers were to a smaller extent a result of a well thought-out decision, compared with when they did not smoke. The estimated morality of the actions performed was lowered and the regrets increased. The

actions did not seem as important and they did not expect the result to be as positive as when they did not smoke. In short, smoking did not facilitate their actions.

Consistently, a division was then made of the actions between those performed during the first week and those performed during the second and third week. Here also, paired comparisons *t*-tests were computed on individual means. Variables showing significant differences ($p<0.05$) are given in Table 6.

Table 6
Means of Rating Variables During the First Week When Allowed to Smoke and the Second and Third Week When Not, Exhibiting Significant Differences

Variable	Week 1	Week 2-3	*p*
Full up	54.6	58.5	0.010
Healthy	71.0	65.4	0.050
Relaxed	66.2	56.3	0.001
Bodily well-being	62.7	51.4	0.001
Friendly	68.1	62.6	0.004
Happy	66.1	59.3	0.004
Calm	68.5	58.5	0.001
Secure	67.0	58.3	0.001
Concentrated	64.1	57.6	0.001
Interested	67.0	61.4	0.002
Involved	66.7	60.3	0.001
Imaginative	56.0	53.2	0.045
Planning	62.2	56.0	0.001
Active	66.1	61.4	0.010
Efficient	59.7	55.6	0.018
Controlled	67.9	60.4	0.001
Skillful	59.9	56.1	0.011
Sociable	59.2	54.4	0.007
Pleasantness	69.6	66.8	0.029
Positive result	74.3	72.6	0.049
Closeness to goal	63.3	66.9	0.012
Regrets	11.6	14.8	0.004
Lack of abstinence symptoms	3.83	2.59	0.001
External relations	4.08	3.42	0.001
Self-appreciation	3.85	3.45	0.005

It is quite obvious that the smokers had a hard time when trying not to smoke. They felt more ill, became more tense and experienced more bodily discomfort. They became more angry, sad, nervous and insecure. Furthermore, they became more unconcentrated, indifferent, uninvolved, unimaginative and unplanned. They also became more passive, inefficient, uncontrolled and unskillful. They found it

less pleasant to perform an action, believed it to have less positive results and had more regrets about it. They experienced rather severe abstinence discomfort, their relations with other people deteriorated and they did not even appreciate themselves very much. In short, they felt very down and not very sociable.

It is interesting to notice that most of the significant variables are what could be classified as *internal*, i.e. measurements of a person's intrinsic evaluations of him/herself, in contrast to *external* variables that describe extrinsic evaluations of the ongoing activity in the surrounding world. This aggregation makes it easier to conclude, that the smokers did not, in any decisive way, change in their attitudes towards their overt behavior while ceasing to smoke, but rather experienced themselves in a more distressing way.

Further analyses of these internal variables seemed worthwhile. Questions 10-13 in the questionnaire consist of 29 preliminarily grouped *internal* variables. The intention was to include somatic and emotional dimensions, as well as cognitive and performance dimensions.

A factor analysis of the individual means from both smokers and controls gave a quite convincing grouping. The initial factor method was Iterated Principal Factor Analysis. The main criterion for retaining a factor was an eigenvalue >1. Rotation was made using the oblique Promax method. Explained variance in the total matrix was 76.8 percent.

The internal variables were, with the exclusion of two due to lack of psychological correspondence with the others, grouped according to the extracted factor pattern to form six internal indices, *viz. body needs*, *body status*, *basic mood*, *feelings*, *cognitions* and *performance*. Even though the factors due to the method of rotation chosen were correlated, variables only rarely loaded high in two factors. The contents of those different internal indices were:

Index 1 (body needs)
- hungry/full up
- thirsty/not thirsty
- sleepy/awake
- tired/alert
- cold/warm

Index 2 (body status)
- ill/healthy
- tense/relaxed
- bodily discomfort/well-being

Index 3 (basic mood)
- angry/friendly
- sad/glad
- nervous/calm
- insecure/secure

Index 4 (feelings)
- frightened/brave
- ashamed/proud
- contemptuous/admiring
- guilty/praiseworthy
- surprised/confined expectations

Index 5 (cognitions)
- unimaginative/imaginative
- devoid of ideas/full of ideas
- unplanned/planning

Index 6 (performance)
- not concentrated/concentrated
- indifferent/interested
- uninvolved/involved
- passive/active
- inefficient/efficient
- uncontrolled/controlled
- unskillful/skillful

With these constructed index variables as a basis, the smokers were compared with themselves during the first week and the two weeks when they were not allowed to smoke. Repeated measures analysis of variance (MANOVAs) were computed on individual means. For the clarity of the presentation, the results for all the index variables are shown in Table 7.

Table 7
Means of Index Variables During the First Week When Allowed to Smoke and the Second and Third Week When They Were Not

Index Variable	Week 1	Week 2	Week 3	*p*
Index 1 (body needs)	56.3	56.2	57.2	0.610
Index 2 (body status)	66.6	56.1	59.1	0.001
Index 3 (basic mood)	67.4	58.2	60.1	0.001
Index 4 (feelings)	56.4	54.7	55.3	0.583
Index 5 (cognitions)	58.0	52.9	55.0	0.016
Index 6 (performance)	64.5	57.4	60.5	0.001

It is obvious and in no way astonishing that the smokers felt quite bad when they abstained from smoking. Somewhat surprisingly, there was no shift at all in body needs, but more in body status, i.e., unpleasant body sensations. The change for the worse in basic mood was just as vast, but little shift occurred in other types of feelings. The deterioration of cognitions and performance was not as vast but nevertheless significant. Important questions arise:

1. How does the experience of different mental levels evolve day by day?
2. How long does it take before the undesirable symptoms subside?

An answer to the first question is presented below in Figure 2, showing the evolution of the significant index variables day by day, during all of the three weeks of phase I in the study, i.e. the time during which the subjects carried the paging receiver and answered questionnaires three times a day.

The figure is quite clarifying. From a relatively high level of comfort during the first week, when the smokers were allowed to smoke, the comfort decreased rapidly already during the first day of abstinence with a minimum two days later. Thereafter the quitters set foot upon a long road towards recovery. The question how long they had to endure the mental torment of abstinence, is of course of central interest for the motivation of anyone considering to quit smoking. A fairly accurate estimation is obtained if a linear regression analysis is performed on data from the second and third week. It shows that one has to calculate with at least 4-5 weeks from the first day of abstinence, until the level of comfort equals that of the first week of the study. This is a long time while it lasts, but knowledge about its prolongation can possibly facilitate smokers' motivation to quit and endure.

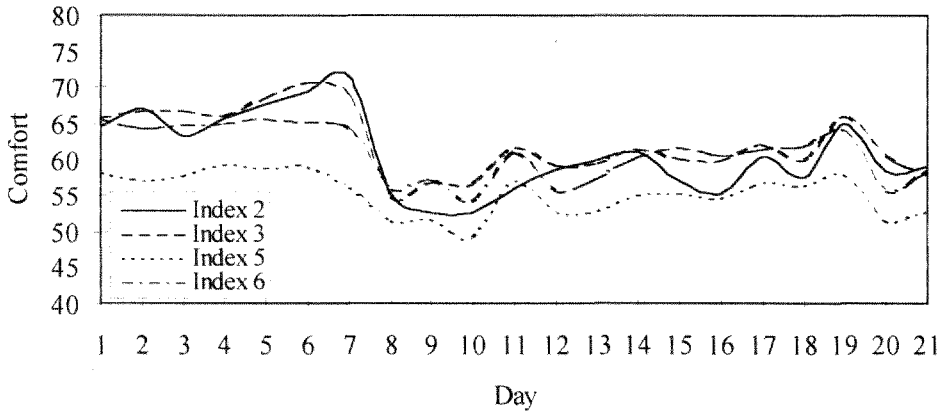

Figure 2. The evolution day by day on three indices during the three weeks of the study with the paging receiver.

Smokers versus normal people

The objective of collecting control data is of course to be able to evaluate in what aspects an experimental group differs from 'ordinary people'. In the previous subsection the smokers were compared with themselves in different ways. Once the effect of the treatment has occurred, i.e. after the day of smoking cessation, it is not meaningful to compare the smokers with the controls, but rather with themselves, which is already done. Thus, in the following subsection different comparisons will be made between the smokers during the first week of phase I and the controls, who as mentioned earlier only participated for one week.

The first explorative attempt will be frequency analyses of the different actions the subjects were involved in when the signal arrived, both main and secondary actions. The outcome of such an analysis is shown in Table 8.

There are some easily detected differences. But to make the data more readable, the different action categories in Table 8 are grouped and ordered according to the categories utilized by Klevmarken (1986). Thus, a more aggregated comparison between the groups is shown in Table 9 along with time allocation.

This level of aggregation makes it easier to see the differences in action frequencies between the smokers and the controls. The smokers spent less time in activities like 'Market work' and 'Travel' than did the controls and instead more time in activities like 'Care and sleep' and 'Pleasure and recreation'. It is interesting to notice that in approximately 40 percent of the cases, both the smokers and the controls were doing something else at the same time.

It is remarkable to find that even though smoking only occurred in 1.3 percent of all cases as the main action during the first week, it occurred as a secondary action

in 8.9 percent of all cases. In addition, it occurred as 'something one consumed while doing other things' in 11.8 percent of all actions. This means that the average smoker spent 22 percent of his/her time during 8:00 a.m. and 22:00 p.m. smoking, i.e., approximately 3 hours out of 14. But little attention was obviously paid to this activity, considering how it was classified. The different kind of actions the smokers were engaged in while smoking can be seen in Table 10 in order of occurrence.

Table 8
Percentage of Different Actions for the Smokers and the Controls

	Smokers		Controls	
Type of action	Main	Secondary	Main	Secondary
Paid work	22.4	1.7	28.6	3.3
Break, waiting	3.1	0.5	3.2	0.7
Housework	9.0	1.2	9.8	2.0
Eating, drinking etc.	9.0	4.2	7.0	4.5
Rest, sleep	2.7	0.4	1.1	0.3
Personal hygiene	2.4	0.5	2.3	0.5
Personal beautification	0.9	0.1	0.6	0.2
Care of children	3.1	0.7	2.0	2.6
Care of pets	0.3	-	0.2	0.1
Confined to bed	0.4	0.1	0.1	-
Running an errand	3.3	-	2.7	0.4
Health care	0.4	-	0.2	0.1
Repair work	1.6	0.1	0.7	-
Education	2.5	0.1	1.1	-
Acquiring information	2.8	1.6	4.4	2.4
Relationship with others	11.7	11.4	8.8	12.8
Relationship with partner	-	-	0.4	0.2
Recreation, relaxation	10.5	5.3	9.7	9.0
Places of entertainment	0.3	0.1	0.8	-
Special hobbies	2.1	0.1	2.7	0.8
Walks, exercise	1.1	-	1.7	-
Voluntary work	0.4	-	0.6	-
Club, church activities	0.1	-	0.9	0.1
Looking at something	-	0.1	0.1	0.4
Smoke-actions	1.3	8.9	-	-
Transportation	7.6	0.3	9.2	0.2
Writing letter, diary	0.4	-	0.5	0.1
No real actions	0.6	0.5	0.8	0.9
No answer	-	61.8	-	58.5

Table 9
Time Allocation to Perform Different Categories of Actions

Action category[a]	Smokers		Controls	
	Main[b]	Secondary[b]	Main[b]	Secondary[b]
1 Market work	25.5	2.2	31.8	4.0
2 Household work	9.0	1.2	9.8	2.0
3 Care and sleep	18.8	6.0	13.3	8.2
4 Shopping	3.7	-	2.9	0.5
5 Repair and maintenance	1.6	0.1	0.7	-
6 Educational activity	5.3	1.7	5.5	2.4
7 Pleasure and recreation	27.5	25.9	25.7	23.3
8 Travel	7.6	0.3	9.2	0.2
9 Other communication	0.4	-	0.5	0.1
10 Miscellaneous	0.6	62.3	0.8	59.4

[a] Klevmarken's categories.
[b] Percentage of 14 hours.

Table 10
Percentage of Different Types of Actions Performed While Smoking

Type of action	Percentage
Relationship with others	24.3
Recreation, relaxation	16.8
Paid work	16.3
Eating, drinking etc.	12.4
Acquiring information	7.4
Housework	5.4
Break, waiting	3.5
Transportation	3.5
Care of children	2.5
Repair work	1.5
Education	1.5
Special hobbies	1.5
Rest, sleep	1.0
Personal hygiene	1.0
Writing letter, diary	1.0
Voluntary work	0.5

The four major categories of actions account for 70 percent of all actions performed while smoking. Smoking was obviously primarily a habit connected with socializing. If this habit mainly was a co-action with other smokers or if the smokers plainly smoked in any company without concern, is an intriguing question, but be-

yond the scope of the collected data. It is quit imaginable that smoking must have taken place in the middle of working tasks, due to the characteristics of addiction, but otherwise the picture of it as being pleasure-seeking in its essence is enforced. Smoking is apparently linked with 'taking it easy and enjoying life', i.e., a hedonistic way of functioning.

The next analyses will deal with the whereabouts of the smokers. The first question is if the locations of the smokers differed in general from those of the controls and the second question is where the smoking typically took place. The results are presented in Table 11.

Table 11
Percentage of Locations Showing Where the Smokers and the Controls Were When the Signals Came

	Smokers		Controls
Location	All actions	While smoking	All actions
Home	41.0	51.2	40.4
Place of work	34.4	30.7	33.9
Means of transportation	6.3	4.2	6.2
Home with acquaintances	6.1	7.8	4.5
Outdoors	1.9	0.6	5.2
Place of entertainment	1.5	1.8	2.0
Hospital	0.5	-	0.4
Club premises	0.1	-	0.5
Church	-	-	0.2
Other premises	8.2	3.6	6.7

Compared with the controls the smokers did not spend as much time outdoors as the controls did and they were a little more in the homes of acquaintances. Smoking at home was over-represented, while the opposite was true for places of work.

Finally, the most worthwhile analysis that can be made, that might shed some light on the dubious influence of smoking on a persons' everyday experience of life, is to relate all the internal and external variables from the study of the smokers to those from the study of the control subjects. For that reason the individual means of all rating and index variables during the first week of the study for the smokers were compared with those of the control group, using *t*-tests. The results are presented in Table 12.

As when the smokers were compared with themselves, it is interesting to notice that most significant variables are what earlier was classified as internal. Two important external variables also reappear.

Thus, the smokers experienced themselves as being more hungry and thirsty, more sleepy and tired and more cold and tense than did the controls. They felt more nerv-

ous and insecure. Furthermore, their actions were not as much a result of a well thought-out decision as those of the controls and they did not perceive their actions as morally justified as the controls did.

Table 12
Means of Rating and Index Variables During the First Week for the Smokers and the Controls. Exhibiting Significant Differences

Variable	Smokers	Controls	*p*
Rating variables			
Not hungry	54.6	62.4	0.012
Not thirsty	52.4	59.2	0.043
Awake	62.1	69.1	0.035
Alert	54.8	62.4	0.038
Warm	57.6	63.3	0.040
Relaxed	66.2	72.9	0.041
Calm	68.5	75.3	0.025
Secure	67.0	74.0	0.027
Thought-out decision	65.2	70.2	0.047
Estimated morality	77.0	85.6	0.007
Index variables			
Index 1 (body need)	56.3	62.9	0.016
Index 2 (body status)	66.6	72.4	0.081
Index 3 (basic mood)	67.4	72.4	0.086
Index 4 (feelings)	56.4	59.2	0.267
Index 5 (cognitions)	58.0	59.6	0.537
Index 6 (performance)	64.5	67.7	0.188

Note. For a more extensive explanation of the index variables see page 138.

The aggregated levels of the index variables allow us to perceive the major differences between smokers and non-smokers. The main difference occurred in body needs, the smokers seemingly depriving themselves of food, drink, sleep and warmth. The differences in body status and basic mood were not as significant, but nevertheless unambiguous. In no aspect did the smokers exceed the controls in well-being.

The post-study interview

The distinction between misusers and abusers of nicotine made prior to the study was further elucidated during the interviews with the participants in the experimental group. It was confirmed beyond doubts that it is necessary to emphasize the category of misusers. The ordinary misuser is probably quite aware of the fact that the ideal is not to smoke. Some surveys have shown that up to 70 percent of

habitual smokers actually wish they did not smoke. However, having become a habitual smoker, the difficulties to quit seem almost impossible to overcome. According to the diagnostic classifications in APA (1994) pathological use is categorized as either Psychoactive Substance Dependence or the residual diagnosis of Psychoactive Substance Abuse.

Four dimensions crystallized during the interviews: the *quantity* smoked, the *regularity* of smoking, the *fidelity* to one type of nicotine product and the *controllability*. An account for those different dimensions of tobacco use is presented below in Table 13.

Table 13
Some Characteristic Differences Between the Typical User, Misuser and Abuser of Nicotine

Characteristic	User	Misuser	Abuser
Quantity	low	quantified	high
Regularity	occasional	daily	round the clock
Fidelity	specific	specific/mixed	mixed
Controllability	high	ritualistic	low

The major difference between the misusers and the other two categories is that smoking, for the misuser, appears in a self-defined niche. With 'quantified' is understood, that they adjust their consumption to a small package[4] or a large package a day. It may even be a carton of cigarettes a week. The average smoker in the present study was a misuser. Users and abusers do not keep track of their consumption.

The total quantity smoked over a period of time is of course dependent of the regularity of smoking. The misusers usually have the same smoking pattern day after day, week after week, linked to the whereabouts and the time of the day. On top of that habitual smoking comes smoking in arousal-situations. Users are more of occasion-smokers and abusers smoke and/or snuff no matter where or when.

The misusers typically use one type of nicotine product and are rather faithful to one brand. They do not ignore the hazards of smoking and try to balance their heavy smoking by choosing low-tar and low-nicotine cigarettes. Users smoke what is offered and abusers consume what is available, when the craving for nicotine appears.

Much in the behavior of the misusers can be regarded as ritualistic. Quantity is linked to the size of the package, regularity to time and places and fidelity to

[4] Small package = 10 cigarettes; large package = 20 cigarettes; carton = 200 cigarettes.

anxiety-reducing brands. Notably, the misusers meet every surprise with a puff. This is the kind of ritualistic control the misusers exert on their everyday addictive behavior. Users have a high degree of control over their smoking and abusers are typically out of control. They must have their nicotine promptly, at any price.

The one-year follow-up

During the year following the day when the smokers were supposed to quit smoking (Q-day), five questionnaires were sent to the subjects, with a mean interval of 12 weeks. The questionnaire contained 10 questions (see Appendix C1), the most important one being how many cigarettes had been smoked during the last week. To get an impression of the degree of success with their good resolutions, Figures 3a-3c are presented below showing the number of cigarettes smoked prior to the study, the number of cigarettes smoked one month after Q-day, and finally the number of cigarettes smoked one year after Q-day. To be easily compared, the numbers of cigarettes per week are used as the dependent variable.

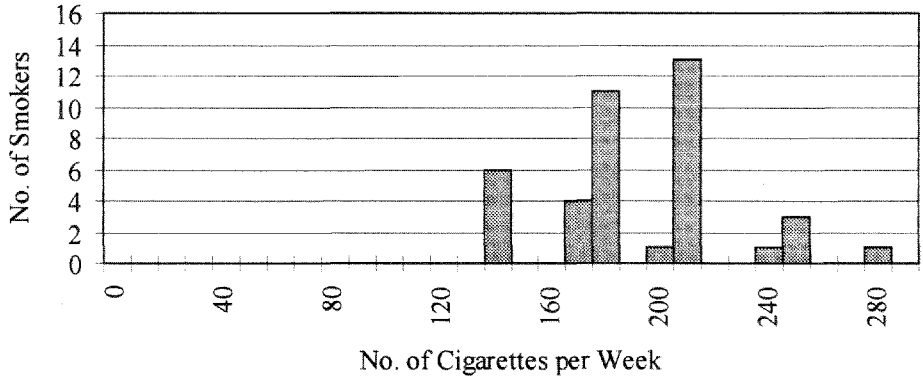

Figure 3a. The number of cigarettes smoked before the study began (*N*=40).

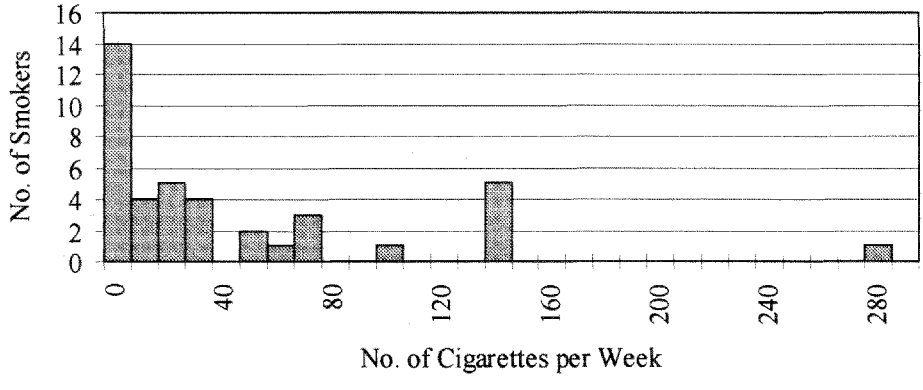

Figure 3b. The number of cigarettes smoked one month after Q-day (*N*=40).

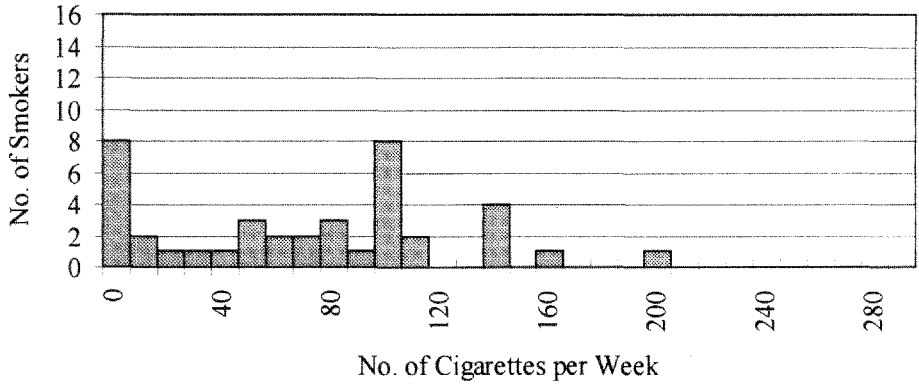

Figure 3c. The number of cigarettes smoked one year after Q-day (*N*=40).

After a first glance at these figures, one is tempted to presume that sooner or later most subjects will start smoking again and slowly return to the level of consumption prior to the study. Before the study, the average number of cigarettes smoked per week was about 190. One month after Q-day, this average number had decreased to around 34 percent of the original consumption, for those who smoked. One year after Q-day the consumption had increased to approximately 46 percent of the original consumption. However, as can be seen in Figure 4, the average consumption reached its peak after half a year, with approximately 50 percent of the original consumption, and then it slowly decreased again. This indicates a lasting effect of the project, those still smoking still fighting their desire on a much reduced level.

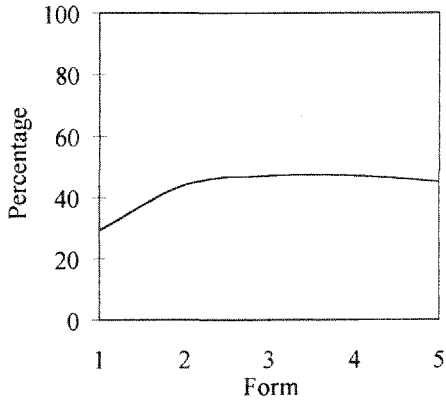

Figure 4. Percentage of original consumption of cigarettes per form for those who still smoked.

A division is made between the 10 subjects who can be considered successful quitters and the 30 less successful quitters. The term 'successful quitters' denotes smokers who have stopped using nicotine completely, or have changed from the category of misusing to the category of using nicotine, while a 'less successful' quitter refers to the rest of the smokers. Changes for 6 dimensions of interest during the year of the follow-up, are shown in Figure 5.

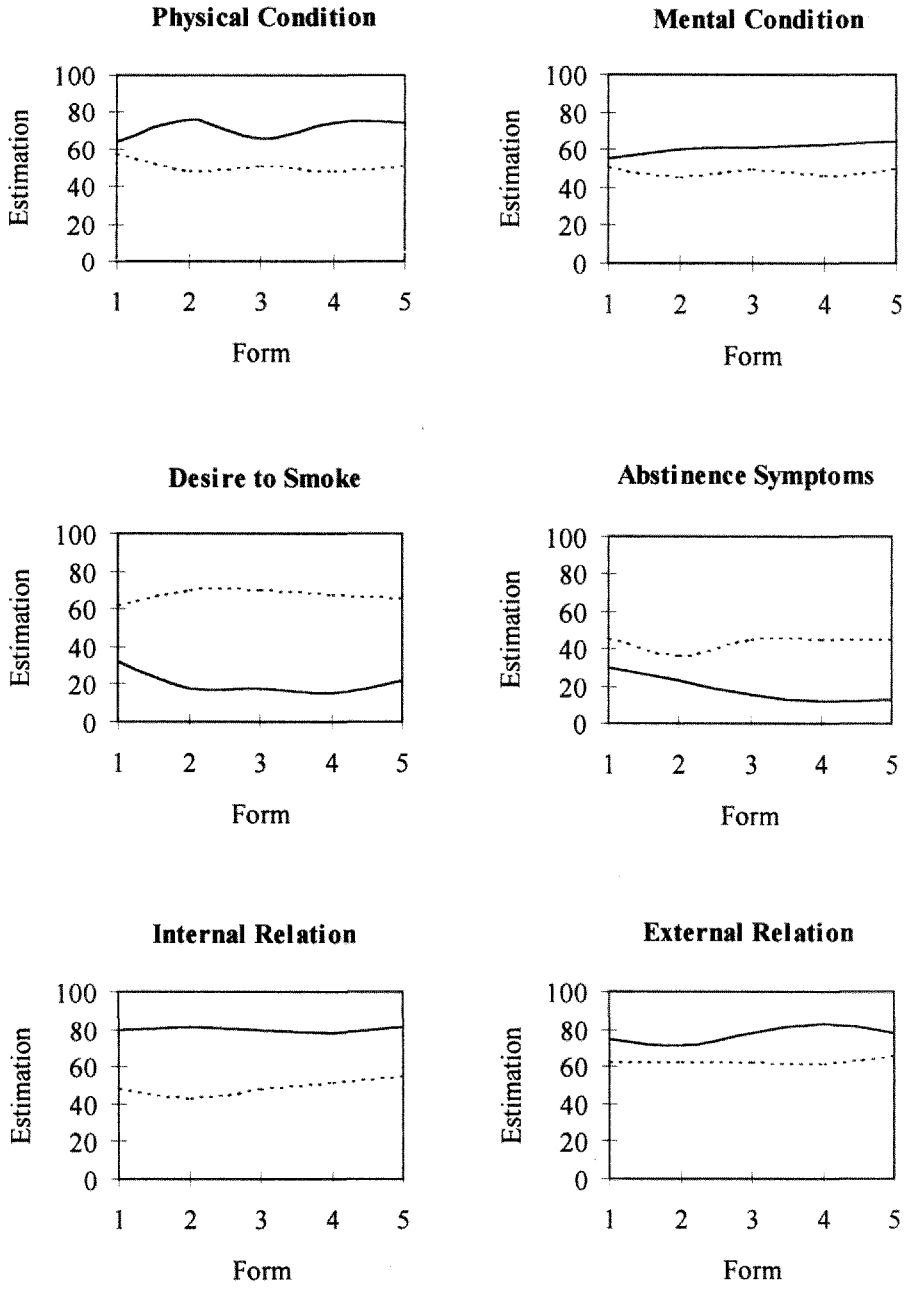

Figure 5. Some differences between the successful quitters (——) and the less successful quitters (- - -) during the year of the follow-up.

First, the smokers who did not continue to smoke improved their physical condition, while the physical condition for those who began smoking again worsened. The difference in physical condition one year after Q-day was substantial. The difference in mental condition went in the same direction; the successful quitters gradually improving theirs, in contrast to the less successful quitters who on the average remained on a stable lower level.

Further, abstinence symptoms for the smoking smokers remained on a high and rather even level, significantly higher than during the week they were allowed to smoke. For the non-smoking smokers abstinence symptoms were gradually reduced. The difference in abstinence symptoms one year after Q-day was quite remarkable and so was the difference in the desire to smoke. This desire did not leave the successful quitters completely, but stabilized itself on a low level, compared to the high level on which the less successful quitters desire stabilized.

Finally, the difference in quality of the relation to people around was not very large, but quite clear-cut, the non-smoking smokers having more relaxed relations than the smoking smokers. On the other hand, the difference in self-appreciation was related to the ability to handle one's desire to smoke and was quite impressive, the less successful quitters of course feeling rather bad, compared to the successful quitters, who most certainly enjoyed a more relaxed life.

Gender differences

There are many ways to analyze the available data, gender-differences being one of particular interest. Who performed the best, the average smoking woman or the average smoking man?

First the male and the female smokers were compared during the first week of the study, to see if they differed in any important aspect to start with. A number of *t*-tests were computed on individual means, but only two variables had an acceptable level of significance ($p<0.05$). The female smokers seemed to be a little more active than the male smokers and furthermore they rated their actions as being a little more common than did the males.

During the second and third week the females still seemed to rate their actions as a little more common than did the males, and furthermore they were a little more value-oriented than were the males ($p<0.05$). This last difference between the genders has been found also in earlier studies (Sjöberg & Magneberg, 1990). Commonness of the action on the other hand is primarily positively correlated with age. More interesting are the facts that abstinence symptoms like tiredness and illness were more common among female quitters than among the male quitters ($p<0.10$).

Males and females smoked just as much during the first week of the study. During the second and third week, when they were supposed not to smoke, the females on the average smoked a little more cigarettes than the males, but this difference was not significant. One month after Q-day, 8 males and 6 females had not smoked during the pervious week. One year after Q-day, 6 males and 2 females had not smoked

during the previous week. Two females had smoked up to 5 cigarettes, but because of their general conduct during the whole year, they are included in the group of successful quitters. Further, during the year of the follow-up, there were some interesting gender differences in the smoking patterns. As can be seen in Figure 6, the females only gradually gave in to the desire to smoke, with a peak at 50 percent of the prestudy consumption after some 6 months. The males on the other hand, fluctuated around 50 percent during the whole year of the follow-up.

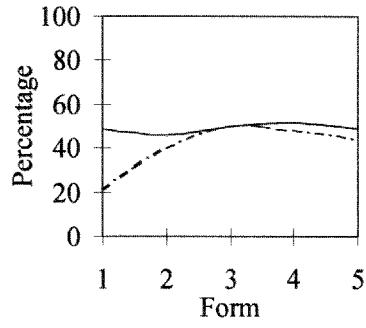

Figure 6. Percentage of original consumption of cigarettes per week for male (—) and female (- - -) smokers.

The men in the study seemed to be a little more able to say 'no' completely than the women. If they gave in to smoking, they seemed to set and keep a quota of the original smoking, while the women gave in gradually up to the point when they matched the men.

If the male and female non-quitters are compared during the year of the follow-up, four of the dimensions presented in Figure 5 show very similar patterns. The remaining two dimensions indicate gender-related differences and are presented in Figure 7.

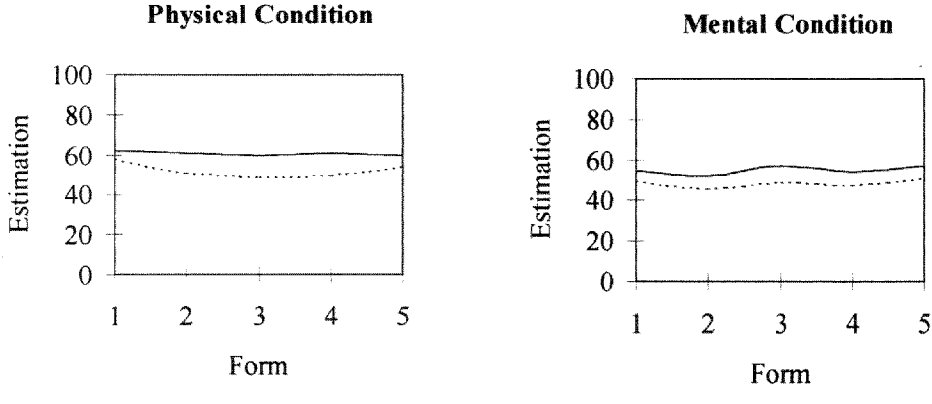

Figure 7. Changes in physical and mental conditions during the year of the follow-up for male (—) and female (- - -) smokers.

The physical condition of both male and female non-quitters seemed to be related to the average consumption of cigarettes during the year, the females feeling worse the more they smoked. The mental condition on the other hand followed the same

pattern for both genders, but the males rated theirs higher than the females. Obviously the female non-quitters had a harder time than the male non-quitters, suffering more both physically and mentally.

The use of strategies

The key to success when trying to quit smoking is of course dependent on many factors, the usage of different kinds of strategies being one. The smokers were prepared for the necessity of conscious diversions of the desire to smoke and encouraged to develop idiosyncratic ways of dealing with it. The aim of these strategies would primarily be to resist the craving for cigarettes and secondarily to canalize the energy to more constructive acts.

At the end of the one-year follow-up 10 smokers were successful in ceasing smoking. First, those successful quitters will be compared with the less successful quitters as to the number of strategies used during phase I and phase II. The outcome of such an analysis is shown in Figure 8 below.

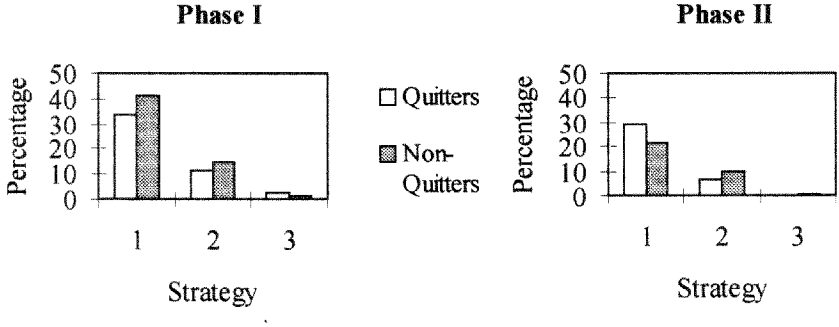

Figure 8. The percentage of time that strategies on different levels were used by the successful quitters compared with the less successful quitters during phase I and phase II.

As can be seen, during phase I the successful quitters used some first-hand strategy in 34 percent of the time, some concurrent second-hand strategy in 11 percent of the time and some concurrent third-hand strategy in 3 percent of the time. The less successful quitters actually used strategies a little more often, which is striking and seems to go in the opposite direction of what would be expected. What seems to happen thereafter, during phase II, is that the successful quitters tend to retain some first-hand strategy during almost the same amount of time, while the less successful quitters reduce their use of some first-hand strategy to a half.

Second, the successful quitters are compared with the less successful quitters as to what *kind* of strategies they used during phase I and phase II. This in turn is shown in Figure 9 below.

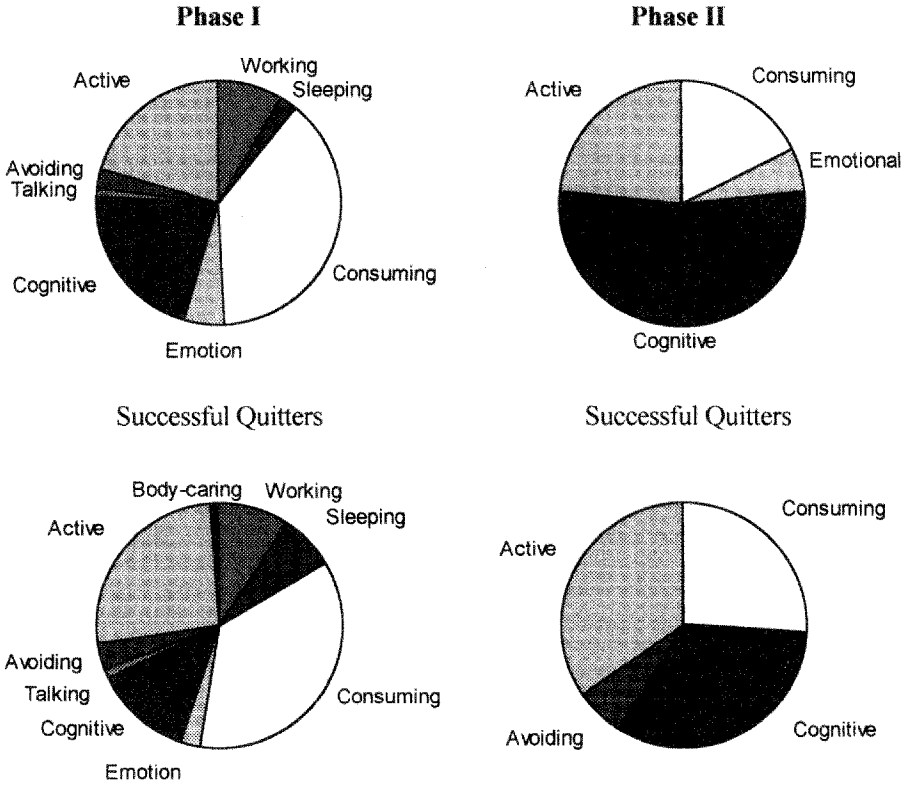

Figure 9. The kind of strategies used by the successful quitters compared to the less successful quitters during phase I and phase II.

When it comes to the kind of strategies used during phase I, the less successful quitters seemed both to be more active and to sleep more than the successful quitters, who instead seemed to work it out more in emotional and cognitive ways. Surprisingly, the less successful quitters stood for 79 percent of all reported strategies.

During phase II the less successful quitters still stood for 73 percent of the reported strategies, but the number of reported strategies was so small that a comparison is not very meaningful. However, it is noteworthy that only three main strategies were used by both categories, Cognitive, Active and Consuming in descending order. For a more detailed account for the categories mentioned here see Appendix D. Successful quitters used cognitive strategies more often than less successful ones.

The six-year follow-up

How stable then was the success rate in the present study? The participants were approached again with a letter and a simple questionnaire six years after Q-day. It was possible to locate 80 percent. A summary of their smoking habits are shown in Figure 10.

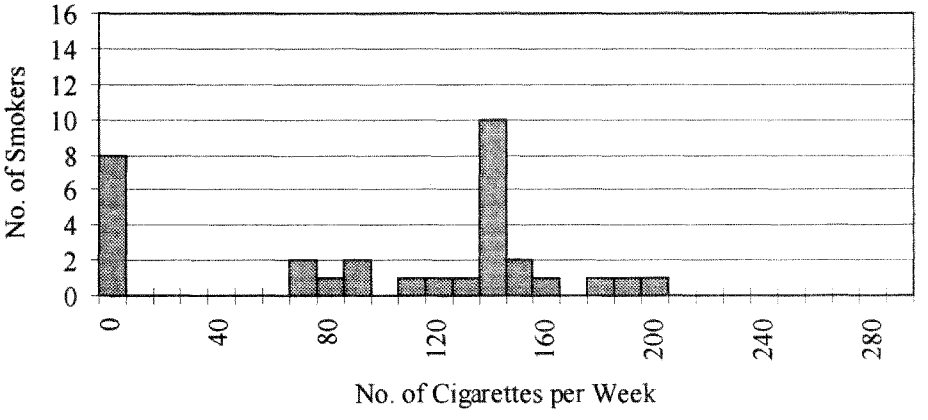

Figure 10. The number of cigarettes smoked six years after Q-day ($N = 32$).

Compared with Figures 3a-3c (see page 146), there are some interesting differences. As hoped, a significant proportion of the participants in the study, namely 25 percent, did not smoke at all. The average smoking of the remainders was 18.9 cigarettes per week, compared with 27.1 cigarettes prior to the study.

Of the successful quitters, 3 were women and 5 were men. The less successful female quitters smoked on the average 18.7 cigarettes per day, while the less successful male quitters smoked 19.3 cigarettes per day.

DISCUSSION

The main findings of the present study will briefly be summarized. In the first set of analyses the smokers were compared with themselves. During the first week of the study when they still were allowed to smoke, there was a noticeable difference in the way the smokers experienced themselves and their actions when smoking and when not. When smoking, they became less hungry, less active, less efficient and they did not seem to be very goal-oriented. This is the pattern of a relaxing person. However, the reason for pausing being to smoke a cigarette, the conduct had a price in moral apprehensions.

The changes in life experience during the weeks when they were supposed not to smoke were dramatic. Quality of life dropped considerably and they were almost tormented by abstinence symptoms. The factor analysis of the internal variables shows that the major shifts occurred in body status and basic mood, which is not surprising, but cognitions and performance were also affected. In the light of these difficulties, it is surprising to find how diligently the smokers actually lived up to their intention not to smoke. The regression analysis of the fluctuations day by day points to a recovery-period of about 4-5 weeks. It would be very interesting to conduct a study to cover this period as well.

In the second set of analyses the smokers were compared with the non-smokers. The largest difference between the two categories concerning what they were doing with their time was that the smokers were substantially less involved in work-actions than were the non-smokers, actually only 78 percent of the latter. As mentioned above the smokers were smoking about 22 percent of their time. It is probably only reasonable to suggest, even though smoking occurred less in working-places than at home, that this lack of work-actions was mainly due to smoking. With smoking came a hedonistic way of functioning. For example, the smokers scored high on relationship with others and actions connected with recreation and relaxation. Even if the smokers said, and they did, that they worked much more efficiently after a cigarette, it is still hard to believe that they could make up for the loss of working-time due to 'stimulating' smoking. The truth is more likely to be that, even if the smokers often work while smoking, a large proportion of the smoking-time is lost working-time. If smoking is prohibited in working places, the immediate effect will probably be an even greater loss of working-time, which in turn will make employers more reluctant to employ smokers.

Let us now turn to the major differences between smokers and non-smokers. Running the risk of being another of those boring studies telling us all that is already known about smokers, all of the results ambiguously point in the same direction: the non-smokers felt and functioned much better than the smokers. Primarily, the smokers experienced themselves worse regarding body needs, body status and basic mood. Where they did not differ in any notable way was the level of cognitions. Many smokers have reported that they smoke to get "clear in the head". Maybe the smokers get clearer in the head when they smoke, but they apparently do not get more clear than non-smokers already are. The price for this striving for clearness is paid by somatic discomfort. In spite of the fact that the smokers on the average felt better and better during the first week, they in no aspect exceeded the controls in well-being.

As mentioned before, the smokers performed well during the first phase of the study concerning their smoking cessation. To quit was the goal and it would probably have been disastrous for the outcome of the study and for the morale of the smokers if 'reduced smoking' would have been the aim. Of course, in reality

this was what came out as the major result. To begin with the less successful quitters, they obviously fought a prolonged and unmerciful battle against their desire and abstinence symptoms. However, the trend was not to go back to the pre-study level of consumption of cigarettes, but a stabilization occurred on a 50 percent-level after some 6 months. This probably means that the commitment of the smokers was still intact and influenced their behavior both in a motivational and moral way. Then turning to the successful quitters, one month after Q-day, approximately 50 percent of the smokers did not smoke at all. This number was reduced to 25 percent after one year.

To evaluate if this was a satisfactory result one could start by wondering if the sample of smokers was representative of the population of smokers attending cessation programmes. Fagerström *et al.*, (1994) present a few characteristics of smokers seeking cessation help. In five studies with a total 5 431 participants, 60 percent of which were females, the average age was 41.9 years and the average cigarette consumption was 27.4 per day. The average age of all smokers in the present study was 41.9 years and the average cigarette consumption was 27.1 per day. Since age probably can be regarded as the most important background variable (Sjöberg & Magneberg, 1990) and the quantity of cigarette consumption as a specially important variable in cessation programmes, the smokers in the study must be regarded as very representative of the population of smokers seeking cessation help.

Then one could investigate how people in general, all methods included from self-initiated to professionally conducted programmes, usually succeed in their attempts to quit. E.g., data of this kind are provided by a survey of California smokers (California Department of Health Services, 1990). A large number of smokers were contacted 18 months after a tax increase on tobacco. About one-half of those Californians who had been smoking 12 months prior to the survey had made attempts to quit, in contrast to approximately one-third of smokers in national surveys. About 15 percent of those Californians were still non-smokers by the time of the survey, but this is no larger than the success rate in the national surveys. Of course, this suggests that the tax may have stimulated an increase in the number of cessation *attempts*, but not increased the proportion of smokers *able to quit* successfully. Since it is often argued by researchers in the field, that more than 90 percent of all people who quit smoking do so on their own without professional help, the quit rate above can almost entirely be regarded as the success rate for self-initiated smoking cessation.

Even though the California study may not be representative for other regions in the world of smokers, it is reasonable to conclude that people undertaking professional help belong to the 85 percent-category that fails to quit themselves. There are quite a few types of cessation programmes to choose from to their disposal. Viswesvaran and Schmidt (1992) have analyzed a large number of different smoking cessation methods and report that self-care methods on the

average resulted in a success rate of 15 percent, which validates the findings of the California survey. The mean quit rates for different intervention methods varies from 7 percent for physician advice to smokers in general to 42 percent for programmes involving patients with cardiac disease. Nicotine replacement programmes also seem to have promising success rates. The average success rate over all situations and settings for the studied cessation methods was 28 percent. However, analyses of control group data indicate that 6.4 percent of the smokers who attend cessation programmes can be expected to quit without intervention. This means that to determine the *net effectiveness* of intervention methods, this percentage must be subtracted from each success rate.

In light of these figures, the quit rate of the current study was close to average. What increases the success of the study is the fact that the participants seem to have been heavier smokers than the average smoker in studies conducted abroad. However, nicotine consumption in general is poorly accounted for in different studies, so data on the number of cigarettes smoked per day in this kind of study are hard to come by. This is regrettable, since the magnitude of the consumption of a drug must be considered to be an important dimension in the evaluation of cessation programmes.

When it comes to gender differences, the male quitters succeeded a little better than the females. During the weeks when they were supposed not to smoke, the females on the average smoked cigarettes a little more than the men. One month and also one year after Q-day the men were in the lead when it came to the number of successful quitters. It is interesting to find that up to six months after Q-day, the slow increase of cigarette consumption is accounted for solely by the women, the men being stable in their consumption. Thus, the men seems to have been more able to put a boundary and stick to it, the women being more prone to gradually give in. However, these results are not in coherence with the findings of the California survey, where women were 50 percent more successful than men. Probably the number of subjects in the present study is too small to detect valid gender differences.

Diversion of desire and nervous energy would be expected to play an important part in any kind of drug-cessation. One would expect the struggling smokers to have at least one clear-cut strategy at hand whenever the symptoms became severe. Surprisingly enough, the successful quitters seemed to use fewer strategies than the non-successful quitters during phase I. During phase II they used almost as many, but now the usage of strategies by the less successful quitters dropped substantially. The successful quitters were more consistent in their approach. But of course, if they had acquired a cluster of strategies that proved to be successful, they had all the reasons in the world to stick to it. The fact that 4 reported strategies out of 5 came from less successful quitters, can either mean that the successful quitters actually needed fewer strategies, or they were more able to suppress their desire and to ignore their abstinence. To handle a desire to

smoke in diverting ways, like taking a walk or eating candy, may not give that good results, since it is obvious even to the surrounding world that it is a behavior linked to smoking. Therefore, the best strategy to quit smoking may be just to do it, and then try just to forget about smoking. Except for that somewhat subliminal modus operandi, conscious cognitive management seems to pay off the best of all strategies.

The long-term results finally are most interesting. One month after Q-day, almost all of the smokers were clustered in none- or low-consumption behavior. One year after Q-day, a division between non-smokers and still-smokers became visible. The latter began to form a normal distribution around a mean value of cigarette consumption half the size compared to prior to the study. Six years after Q-day, finally, the mean value of this distribution had reached a consumption level of 'one-large-package-a-day'. If the spontaneous success rate of smokers attending cessation programmes is subtracted from the total success rate in the study, the success rate *solely* due to the study is at least 18 percent. And further, the still-smokers had changed their smoking habits in a quantitative way, shifting from *one carton a week* to *one large package a day*, a notable reduction of 30 percent. Even if some spontaneous change can be expected in the performances of the participants in the study, those results just described can very well be regarded as the net outcome of the treatment.

The research so far accounted for has been concerned with one of the basic issues for a long time in psychological field studies: addiction. Addiction can be said to have two sides, one behavioral and one pharmacological, with different weights in different kinds of addiction. This particular study has focused on the misuse of nicotine. Of the Swedish population, approximately 25 percent of the males and 30 percent of the females, in the age interval 30-55 years, smoke cigarettes on a daily basis (Ramström, 1993).

Addictive behavior is usually associated with abuse. In an attempt to improve the theoretical constructs in this important field, a further discrimination is here advocated for. Addictive behavior is per definition repetitive and undesired. However, a lot of our behavior is repetitive but not undesired, until, according to some reference norm, the cost for the behavior is out of proportion compared to the benefit. Thus, the common denominator of all addictive behavior is that people, in order to get their 'kicks', are willing to pay a high price in a physical, psychological, social or monetary form. It is emphasized here, that any human activity or any substance that people ordinarily consume can become the object of addiction. The notorious shoplifting wife of a rich judge is conducting an addictive behavior, and so is the habitual smoker.

In the present study, a rough discrimination between at least three categories of nicotine consumers was made: *users*, *misusers* and *abusers*. First, the user is a temporary nicotine consumer, in control of his consumption, preferably using one specific type of tobacco product, in quantities far below that of a package a day.

This is the typical 'party-smoker'. The misuser is a regular nicotine consumer, ritualistically in control of his consumption, preferably using one specific type of tobacco product, in quantities adjusted to the size of the package chosen. This is the typical 'one-package-a-day-smoker' or 'one-carton-a-week-smoker'. Finally, the abuser is a regular nicotine consumer, out of control of his consumption, preferably using more than one type of tobacco product, in quantities that reach from a couple of packages a day to an unmeasured but high level of consumption. This is the typical 'chain-smoker'.

The sizes of these three categories of smokers are difficult to estimate, since data usually are not collected in sufficient detail. However, Fagerström *et al.* (1994) have collected survey data from different countries. To assess the degree of nicotine dependence a dependency questionnaire, developed by Fagerström, was used. In a random population sample, approximately half of the smokers were in the low-dependency category, one third in the medium-dependency category and the rest in the high-dependency category. In a randomized clinical trial of smoking cessation, the medium-dependency category was approximately of the same size, while the low- and high-dependency categories were reversed. This means that smokers who seek help in stopping smoking are much more dependent than the average smoker. It is also interesting to notice that men consistently score higher on dependence than women.

Methodologically, the approach taken differs from earlier studies in a few important aspects. First, the method chosen gives more accurate and detailed descriptive data than any previously used in the field. Second, the design of the study makes comparisons between smokers and non-smokers in their everyday life possible and permits insight into the hardship of abstinence and the features of recovery after smoking cessation. Finally, somehow in an apparent conflict with the overall prevailing intention in science of collecting bias-free data, would it be possible to canalize the unavoidable influence from the experimenter into one experimental factor? Thus, the main hypothesis was that electronic surveillance along with the method chosen, random action sampling, would stimulate the smokers to quit.

The experimental group and the control group were recruited via advertisements in daily newspapers. This is a seemingly expensive way to acquire voluntary subjects, and what is worse, could constitute a threat to the validity of the study. The best alternative way would have been to buy a random sample from the population register and approach maybe 500 persons by letters and telephone calls. This was done in an earlier study of retired people (Sjöberg & Magneberg, 1990), but the distinctive experience from that study was that the procedure was very expensive and time-consuming and yielded a relatively small number of persons willing to participate in the study. It is true that people who answer advertisements can be believed to be more extravert than people who do not, but usually people who accept an invitation via letters and telephone calls can also be

expected to be more extravert. Therefore, the main concern would be that the smokers and the non-smokers were recruited *the same way*. And in perspective, the procedure with advertisements was rather money-saving and very time-saving. It cannot possibly constitute a greater threat to the validity of the study than many other studies have to endure due to their ways of recruiting subjects.

Because of the overwhelming interest from both smokers and non-smokers, it was possible to match the two groups in many ways, the most important background variables being *age* and *education* (Sjöberg & Magneberg, 1990). An important feature of the study of the control-subjects, was that they were given an identity of their own, not just referred to as 'control subjects'.

The fact that the smokers participated for 3 weeks with three signals a day and the controls only one week, but with five signals a day, can of course have influenced the results in some way. During the first week of the study, some smokers might have been excited facing the coming reality of being given a chance to quit smoking and some might have been depressed. The variability of mood would be expected to increase in this group, but the mean level would have been uneffected. The controls, on the other hand, could be expected to change only in the direction of exaltation, being in focus and experiencing themselves as unusually important. Hence, it is not very likely that the *sign* of the differences changed, but we could expect an increased of the magnitude of differences between the two groups, making more variables significant.

Beyond that, the differences in the number of signals per day and the variation in the last page of the questionnaire for the smokers and the controls is not believed to have influenced the results in any noticeable way. The fact that most questions in the questionnaire focused on everyday life for both groups, means that the differences in the last page are not very important.

The difference in reply frequency was expected. As mentioned before, the frequency of reported actions can be considered as a coarse, but nevertheless reliable, assessment of the ability to master everyday life. Thus, the smokers actually had greater difficulties to control their lives than the controls.

The consumption of cigarettes, i.e., nicotine, was under control during all of the study. The questionnaire was so constructed, that if the subject was only telling the truth, any smoking would be detected. Gratifyingly enough the smokers really kept their promise not to smoke after the first week, with the exception of a few relapses now and then. The whole study would of course have been in vain if that had not been the case.

How people intentionally change addictive behaviors is not well understood by behavioral scientists. Diligent work in this field has been done by Prochaska and DiClemente, who have developed transtheoretical constructs of stages and processes of change (Prochaska & DiClemente, 1983). According to their research, modification of addictive behavior involves progression through five stages - precontemplation, contemplation, preparation, action, and maintenance - and indi-

viduals typically recycle through these stages several times before termination of the addiction.

However, even more interesting is the theoretical construct of processes of change. According to this theory relapse is the rule rather than the exception with addictions. During relapse, individuals regress to an earlier stage. Approximately 15 percent of smokers who relapsed regressed back to the precontemplation stage (Prochaska & DiClemente, 1986). Fortunately, this research indicates that 85 percent of the relapsers regress back to the contemplation or preparation stages (Prochaska & DiClemente, 1984). They begin to consider plans for their next action attempt, while trying to learn from their recent efforts. Because of these findings, a spiral pattern of change is advocated, which means that each time relapsers recycle through the stages, they potentially learn from their mistakes and can try something different the next time around (DiClemente *et al.*, 1991).

These results can be regarded as validated by the present study. The post-study interview revealed many relapses both during phase I and during the time up to the interview, but the standard phrase from the relapsers was that they had in no way given up and that they were going to keep trying. In light of the fact that maintenance is to be regarded as a continuation, not a static stage, this stage is viewed to extend from six months to an indeterminate period past the initial action. Data from the one-year follow-up confirm that the smoking-pattern stabilized after some six months.

As shown by Galanter (1993), network therapy can be effective in rehabilitation programmes. The participants in the present study only met twice, but still most of them reported, during the follow-up interview, the supporting influence they had felt from the fact that they shared their hardships with others, under *the same conditions* and *during the same time*. If they felt agony they could say to themselves: "I'm not alone in this misery - I won't give up and let the others down ". This feeling of solidarity was an intended quality of the design of the study.

The purposes of the present study from a scientific point of view were initially descriptive and explorative. In these respects the study must be considered successful. An abundance of data has given a high-resolution picture of the effect of nicotine misuse on everyday behavior and the effect of smoking cessation. However, it became clear at an early stage that a theoretical distinction, concerning the target category of the study, had to be made. This construct must be considered supported by the findings of the study. Finally, a hypothesis, that the influence of the investigator could successfully be transformed into an experimental factor under control, must be considered tentatively verified, even though no actual reference group of smokers who did not participate in the study existed.

Relating to the psycho-social frame of the study, it is satisfying to know that there was an immediate result of the study in terms of raising life quality among people in a group of nicotine misusers. A similar study has been conducted on al-

cohol misusers, with equally satisfying results, and is accounted for in a separate report (Magneberg & Sjöberg, 1995). These studies may very well serve as a solid basis for future studies more aimed at dealing with hypotheses and theoretical constructs relating to health behavior.

In this kind of research it is of the utmost importance that the investigator defines his role very explicitly to the subjects in the study. Overtly recognizing interdependence between the investigator and the subjects, and between the subjects themselves, also seem to be fruitful features to emphasize. The meta-structure of a study is much more than the sum of resources, design and method. It is the dynamic framework within which we want to study parts of reality, and without which we cannot do so successfully.

Summing up, the net results of the study, in terms of terminated and reduced smoking were very satisfactory. The psychological profile of the smoker, when smoking and when trying to quit, has an exceptional resolution. In studies of this kind the method of random action sampling is highly recommended.

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THE EFFECT OF ELECTRONIC SURVEILLANCE ON ALCOHOL MISUSE AND EVERYDAY BEHAVIOR

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ABSTRACT

The present study of the everyday behavior of alcohol misusers, belongs to a series of studies using a special technique for conveniently reaching the subjects at any time, anywhere and to sample their everyday behavior. One purpose of the study was to help a group of heavy drinkers to reduce or cease drinking. Another purpose was to study how alcohol misusers differ from matched non-drinking people, and to obtain a psychological profile of them before and during their attempts to control their drinking. The belief was that an experimental design with a moral contract and electronic surveillance would facilitate the drinkers' attempts to control their alcohol consumption. The results in terms of reduced and terminated drinking were very satisfactory and the method of random action sampling made detailed and explorative analyses possible.

Key words: Alcohol, alcohol misuse, drinking, drinking cessation.

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INTRODUCTION

Much research has been conducted on addictive behavior. The field of research is large and important, and further development is highly desired. Recent important contributions for broadening the field have come from the Institute of Medicine (1990) and CUS (1994).

In previous studies, a method has been developed for studying naturally occurring behavior (Magneberg, 1995a; Magneberg, 1995b; Sjöberg & Magneberg, 1990; Magneberg & Sjöberg, 1995;). A small portable device signals the subject at random intervals, when he or she is to give a structured report on the ongoing activity. In the course of developing this method, control group data have also been collected, which makes it possible to create a reference norm with which to compare groups of special interest.

Beside the desire to develop a method of studying people's ordinary behavior, the aim so far was to describe different interesting categories of people, what they were doing with their time, how they perceived their actions, how they experienced themselves and the surrounding situation, etc. Interestingly enough, many participants overtly commented on the benevolent influence of this self-reflecting activity on their lives. Furthermore, the studies carried out on groups of problem drinkers and alcoholics indicated a therapeutic effect, without this having been our intention. The experiences from all these previous studies were combined in more applied studies, with the objective to induce different categories of misusers to control their misuse.

A distinction is emphasized between use, misuse and abuse of alcohol. This distinction will be further clarified in later sections. The distinction is important, because it gives more nuance to the way of looking upon any use of psychoactive substances, and may deepen our understanding of addictive behavior.

The present paper describes how the developed method was applied to a study of the everyday behavior of a group of heavy alcohol consumers, both when living their normal life and when trying to control their heavy drinking. An equivalent number of control subjects were recruited the same way as the experimental group, to make comparative analyses possible. A heavy alcohol consumer is here defined as a person who drinks considerably more alcohol than people in general over a given period of time, but nevertheless is not to be regarded as an alcoholic. From now on the heavy alcohol consumers will only be referred to as *drinkers*.

Statistical information on the distribution of drinking habits in different age cohorts for men and women is unfortunately not available. Average consumption of alcohol 40 percent for middle aged people is 26 cl per week (CAN, 1994), but this tells us little.

Men drink alcohol more frequently and more heavily than women (NIDA, 1988). Age and religiosity are negatively correlated with alcohol consumption (Gallup, 1985). Single, divorced, and separated individuals consume more alcohol than currently married individuals (Abbey, Scott, Oliansky, Quinn & Andreski, 1990). Education and income are positively correlated with alcohol consumption (Clark & Midani, 1982).

One of the oldest etiological theories of alcohol consumption is that people drink alcohol to reduce stress and negative affect. As stress increases, alcohol consumption increases in both social drinkers (Higgins & Marlatt, 1975) and problem drinkers (Miller, Hersen, Eisler & Hilsman, 1974).

Researchers have for a long time examined the links between motives for drinking and alcohol consumption. Most of them have focused on two broad categories. The first category revolves around drinking for negative reinforcement or what Mulford and Miller (1960) called 'personal-effect motives'. This motive to drink has also been labeled 'drinking to cope', and is defined as the tendency to use alcohol to escape, avoid, or regulate unpleasant emotions (Segal, Hua & Singer, 1980). The second category revolves around drinking for positive reinforcement or what Mulford and Miller called 'social-effect motives'. This drinking motive has been labeled drinking to be sociable and encompasses drinking to be convivial, to celebrate social occasions, to have a good time with others, and to enhance one's social confidence.

Most people undoubtedly want to control their drinking behaviors. This creates no problem for the ordinary user, but more so for the misuser, and for the abuser of alcohol the only real solution would probably be to quit completely. Misusers and abusers are up against a volitional problem, i.e., how to take a decision and how to maintain it by avoiding relapses. Elaborate work on the volitional topic has, among others, been conducted by Sjöberg and Samsonowitz (Sjöberg, 1980; Sjöberg, 1985; Sjöberg & Samsonowitz, 1980). They found that failures of the will are brought about by emotional stress, which can be either negative or positive. Further, failures were preceded by twisted reasoning of various kinds, and by a shortened time perspective. Addicts who knew about and used techniques for coping with relapse prone situations, were more likely not to have a relapse.

In the most recent research in the field of how people change addictive behaviors, stages and processes of change have come into focus (Prochaska, DiClemente & Norcross, 1992). In summarizing research on self-initiated and professionally facilitated change of addictive behaviors, they make use of a key transtheoretical constructs of stages and processes of change. Modification according to them involves progression through five stages - precontemplation, contemplation, preparation, action and maintenance - and individuals typically recycle through the stages several times before termination of the addiction.

The main purpose of the present study was to create a facilitating experimental environment for a group of drinkers where to cease or control their drinking, and

to study the influence of alcohol misuse on everyday behavior. Similar data from a control group were also collected. The method used is called Random Action Sampling (RAS), and is made possible by the application of modern technology.

METHOD

Subjects

Drinkers. A total of 40 subjects participated, 16 females and 24 males. They were selected from a group of people answering advertisements in daily newspapers in different regions of Sweden. The advertisement briefly described the study and invited drinkers to contact the investigator for further information. Those who did so got involved in a three-stage letter procedure, in which they at one occasion had to fill in and return a questionnaire with relevant background questions. Considerably more male drinkers responded than met the criteria of heavy drinking, at least half of them meeting the more severe criteria of alcoholic drinking. Control group data had already been collected in connection with a study of smokers. Among those who met the criteria of heavy drinking, it was possible to select a rather well matched and well motivated group of male participants. They were well matched to the pool of control subjects concerning some important background variables, and they were well motivated both to participate in the study and to quit or control drinking. Not that many female drinkers responded to the invitation, so it was not possible to get an even distribution (20/20) over gender. To give the people in the experimental group an identity, the study was called 'Projekt Stordrickare'[1].

The general criteria for participation were:

1. *Age*: 30-55 years
2. *Work*: preferably full time - not on sick leave

The special criteria for participation were:

1. *Drinking*: misuse of alcohol, not abuse
2. *Other misuse or abuse*: not medicine or nicotine
3. *Physiological/psychological problems*: nothing serious
4. *Will to reduce or quit drinking*: very strong

Some common background variables for the drinkers are shown in Table 1 along with relevant variables concerning the drinkers drinking habits. The variables are first presented below:

[1] 'Project heavy drinkers.'

Age	The number of years
Education	(1) = Comprehensive school (or equivalent) (2) = Upper secondary school - " - (3) = University degree - " -
Work	The number of hours of work per week
Living	(1) = With parents (3) = With a partner (5) = In a group (2) = Alone (4) = Married
Children	The number of children
Start-age	The age at which drinking became regular
Habit	The number of years with undesirable amount of drinking
Attempts	The number of attempts to quit drinking
Goal	(0) = To quit drinking (1) = To reduce drinking
Help	(1) = No outside (2) = Outside help with alcohol problems
Alcohol	Average consumption in cl of alcohol 40% per day

Table 1
Some Relevant Background Variables for Male and Female Drinkers

Background variable	Male Subject no.																				
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	Mean
Age	36	37	40	41	42	43	44	45	45	45	48	49	49	51	51	51	52	54	59	62	47.2
Education	2	2	3	3	2	3	3	1	1	2	1	2	2	2	2	2	3	2	3	2	2.2
Work	20	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	20	38.0
Living	3	1	4	3	4	3	4	4	4	2	2	2	4	2	4	1	2	2	2	3	-
Children	0	0	2	0	3	2	3	2	2	2	1	2	2	4	1	0	3	3	0	3	1.8
Start-age	20	27	25	18	21	25	28	25	23	30	30	32	20	27	25	21	30	18	17	43	25.3
Habit	12	5	10	15	15	8	6	9	10	13	15	13	25	5	20	30	15	25	35	20	15.6
Attempts	1	0	9	0	9	6	9	0	2	4	9	6	0	0	9	9	9	0	2	0	4.2
Goal	1	1	0	0	0	0	1	1	0	0	1	0	1	0	0	0	1	1	1	1	0.5
Help	2	1	1	1	2	2	1	1	1	2	2	2	1	1	1	2	1	1	2	1	1.4
Alcohol	30	40	25	20	54	43	50	24	22	48	50	40	25	30	30	37	32	19	6	25	32.5

Background variable	Female Subject no.															Mean
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Age	32	33	33	34	37	39	40	40	41	41	42	42	46	52	54	40.4
Education	3	2	2	1	3	3	1	2	2	2	1	3	2	2	1	2.0
Work	40	40	28	20	40	40	20	40	40	40	40	40	40	0	0	31.2
Living	4	2	3	2	2	4	4	4	4	3	2	2	2	3	2	-
Children	0	1	2	2	2	2	5	1	2	1	1	2	2	2	1	1.7
Start-age	21	31	18	14	25	30	35	20	24	30	20	35	25	35	25	25.9
Habit	6	2	4	10	5	9	4	7	10	10	10	2	10	15	15	7.9
Attempts	2	1	0	2	0	1	4	0	9	2	0	0	0	9	0	2.0
Goal	1	1	1	1	0	0	0	1	0	1	0	1	1	1	0	0.6
Help	1	2	1	1	1	1	2	1	1	2	1	1	1	2	2	1.3
Alcohol	24	24	24	20	30	21	21	21	10	30	12	30	15	40	43	24.3

One woman and four men did not carry out the study in the required way and were therefore excluded from the data analyses. This exclusion did not depend on their possible failure to control their drinking, but on the fact that they stopped filling in the questionnaires during the first phase with the paging receiver. In earlier studies, the average number of drop-outs has been just less than one per group of 20 subjects.

Table 2
Some Relevant Background Variables for Male and Female Control Subjects

Background variable	Male Subject no.																				
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	Mean
Age	30	32	33	33	35	35	39	39	42	45	46	46	47	48	48	50	52	52	53	55	43.0
Education	3	2	3	2	2	3	2	1	2	1	2	2	2	1	2	1	3	3	1	1	2.0
Work	40	40	40	40	40	40	40	40	40	40	40	40	40	32	40	40	40	40	40	40	39.6
Living	3	2	4	3	4	3	4	4	2	3	2	4	4	2	2	4	4	4	4	4	-
Children	0	2	1	2	2	0	1	1	0	0	3	3	1	1	3	3	2	2	2	4	1.7

Background variable	Female Subject no.															Mean
	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
Age	32	33	34	35	37	37	38	38	40	42	45	48	50	52	54	41.2
Education	1	3	3	2	2	2	3	3	1	3	1	1	1	2	2	2.2
Work	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40.0
Living	2	3	4	2	2	4	2	2	3	2	3	2	2	3	3	-
Children	0	0	1	0	0	0	0	0	3	1	3	2	1	2	0	1.1

Note. For a more extensive explanation of the different background variables see page 171.

Control group. A total of 40 subjects participated, half males and half females. They were selected from a group of people answering advertisements in two daily newspapers in Göteborg. The advertisement briefly described the study and invited those who were interested to contact the investigator for further information. Those who did so got involved in a three-stage letter procedure, in which they at one occasion had to fill in and return a questionnaire with relevant background questions. Considerably more people responded to the invitation than could possibly participate in the study. There were no difficulties to select a rather representative and well motivated group of participants. They were representative of the population as a whole concerning some important background variables, except for some restrictions presented below, and they were well motivated to participate in the study. In contrast to the experimental groups, the

subjects in the control group were offered a tax-free fee of 250 SEK. To give the people in the control group an identity of their own, the study was called 'Projekt Göteborgare'[2].

The general criteria for participation were:
1. *Age*: 30-55 years
2. *Work*: preferably full time - not on sick leave

The special criteria for participation were:
1. *Misuse or abuse*: not medicine, nicotine or alcohol
2. *Physiological/psychological problems*: nothing serious

The same background variables as before are presented for the control subjects in Table 2.

Background differences

It is of course of the greatest importance that the drinkers and the controls did not differ in any important aspect other than their drinking habits. To see whether the group of drinkers differed from the group of control subjects concerning the background variables, in which they were supposed to be matched, the groups were compared in this respect using *t*-tests. The results are shown in Table 3.

Table 3
Means of Background Variables for the Drinkers and the Controls

Background variable	Drinkers	Controls	*p*
Age	44.3	42.1	0.23
Education	2.1	2.0	0.52
Work	35.1	39.8	0.01
Children	1.7	1.3	0.15

Note. For a more extensive explanation of the different background variables see page 171.

As can easily be seen, there was only one significant difference between the experimental group and the control group, namely the number of hours of work per week. This was due to the fact that two women were unemployed, which in turn had little to do with their drinking habits. Although those common background variables do not have a great impact on behavior in general, it is comforting to know that they are under control. Differences between the groups

[2] 'Project Gothenburgers.'

will now more likely be attributable to the fact that one group was abusing alcohol and the other one was not.

Procedure

The drinkers participated for three weeks and the controls for one week. They were all given a pack of questionnaires, a pocket size paging receiver and written instructions. A moral contract to carry out the project, no matter how successful or unsuccessful they were, was established with each drinker by a handshake.

The experimental group received three signals per day and the control group five signals. The paging receiver made it possible to reach all subjects simultaneously anywhere in Sweden by means of the FM broadcasting network. Transmitting times for the signals were selected at random, after dividing the day into an adequate number of time periods. Every signal sent to the subjects was initiated by the investigator. Subjects could not know in advance when to expect a signal.

The subjects were instructed to carry the pager from the time they woke up until the time they went to bed, with the limitation that no signals were to be transmitted before 8:00 a.m. or after 10:00 p.m.. When the signal was received, each subject was to register and evaluate what he/she was doing at that very moment. Preferably immediately, but otherwise as soon as possible, they were to use one questionnaire and answer *all* of the questions it contained.

A numerical device on the pager showed, for each signal, a code for the consecutive order of the signal, along with a code showing the time the signal was transmitted. The code for the consecutive order made it possible for the subjects to realize, at an early stage, if a signal had passed unnoticed. The time-code was to be written down on the questionnaire along with the time when the subject actually started to respond to it. The pager could memorize two time codes, which could be useful in cases when the next signal came before they had been able to respond to the previous one.

The subjects were instructed to try to ignore the fact that they were carrying the pager and to carry on with everyday life as normal. During the first week of the study, the drinkers were instructed to maintain their drinking habits as always. At the beginning of the second week they were to quit drinking completely for the rest of the study. As a support they received a letter the day they were to quit with 'best wishes'. The drinkers were informed of the necessity to develop personal ways of dealing with the unavoidable abstinence symptoms and the desire to drink.

After three weeks and when this phase of the study was completed, each subject in the group of drinkers had a follow-up interview for one hour with the investigator. Thereafter, to follow up changes during the following year, five questionnaires were sent to this group, with a mean interval of about 12 weeks. Finally, a five-year follow-up was conducted to evaluate the long-term net results of the study.

Questionnaire

The questionnaire had two parts (see Appendix B & B2). The first 32 questions were intended to map the current situation and the action carried out at the time of the signal. There were two main types of questions - open questions and rating scales. In the former category, the subjects were first asked to state what they were doing when the signal arrived, and if they were doing something else simultaneously. Then they were asked about their location and what the goal of their action was. The final open question at the beginning of the questionnaire was what consequences they believed the main action would lead to. At the end of the questionnaire they had to state, if possible at four levels of abstraction, the reasons they had for performing the action stated. The questions were coded according to a constructed schedule with a large number of categories for each question.

All graphic rating scales were measured and read directly into a computer with a digitizer board, giving the different variables values from 1 to 99.

The objective of the concluding questions of the questionnaire was to ask some drinking-related questions. The first of these questions about asked how much and what kind of beverages they had had since the last questionnaire. The open question at the end of the questionnaire asked about strategies for handling the craving for alcohol and there were some additional scales. The last page for the controls had questions of general interest, possibly useful for future investigations.

The computer program mentioned above was written prior to the present studies and could not, due to inadequate resources, be altered to suite the questions on the last page of the questionnaire. That is why a bipolar discrete rating scale with five categories was used.

The post-study interview

During this interview, every subject in the group of drinkers was given freedom of choice to talk about anything they liked. The conversation naturally focused on their misuse problem and their experiences during the weeks of the study.

RESULTS

Scoring

With 3 signals per day for 21 days, the number of reported actions from each subject in the experimental group should be 63. With 5 signals per day for 7 days, the number of reported actions from each subject in the control group should be 35. Some reports were missing. The total number of reported actions, and the reasons for omitted reports, can be seen in Table 4.

The frequency of reported actions for the drinkers was satisfactory (84.9 percent) and very satisfactory for the controls (94.1 percent). The high reply frequency con-

tributes substantially to the validity of the results. In previous studies (Magneberg, 1995a; Magneberg, 1995b; Sjöberg & Magneberg, 1990; Magneberg & Sjöberg, 1995) the average frequency of reported actions was 91.2 percent. This indicates the interest people have when participating in this type of study.

Table 4
Number of Signals, Reported and Missed Actions and Reasons for Omitted Reports

Signal/action	Drinkers (*N*=35)	Controls (*N*=35)	Sum	Percentage
Reported actions	1 872	1 153	3 025	(88.2)
No report because of:				
Sleep	73	29	102	(3.0)
Technical problems	116	25	141	(4.1)
Unknown problems	144	18	162	(4.7)
Sum	2 205	1 225	3 430	(100)

The difference in reply frequency was expected. The control subjects did not have any misuse problems and volunteered for the sake of a good cause. They were expected to carry out the investigation in the best of manners. The drinkers on the other hand were not expected to control life as elegantly as the controls. The frequency of reported actions can therefore be considered as a coarse, but nevertheless reliable assessment of the ability to master everyday life.

The omitted reports can be divided into three categories of about the same size: sleep, technical problems, and unknown problems. The last category might conceal actions or states the subjects were unwilling to report, like sexual acts, going to the bathroom, having a hangover, etc. However, the general impression is, as in previous studies, that the subjects answers were fairly honest and accurate. The missing actions were relatively few and do not jeopardize the interpretation of the results of the study in any crucial way.

The median time-lapse between signal and questionnaire response was 15 min for the drinkers and 13 min for the controls, while the means were 40 and 34 min respectively. Only a few percentages of the reported actions were without specification as to what time the filling in started. The medians are somewhat higher than those of earlier studies, while the means are closer. However, the two groups did not differ significantly in these aspects.

The actions were coded by one experienced coder. In an earlier study (Sjöberg & Magneberg, 1990) a reliability test of the answers to open questions was performed and found to be satisfactory.

Within group analyses

Drinking alcohol is a persistent pattern of behavior quite resistant to change. Quitting or controlling drinking is for most people a very difficult task, bound to demand a lot of conscious efforts.

Even though all drinkers in this study were strongly motivated to do something about their alcohol misuse, the first thing one might wonder is how well they succeeded in keeping their promise to stop drinking the day they were supposed to. Question 33 in the questionnaire asked about how much alcohol had been consumed since the previous signal. There are two ways to analyze these data. First we will analyze the average consumption of alcohol day by day during phase I, these results are shown in Figure 1a, and then we will analyze the hourly consumption day by day during the first week of phase I. These results are shown in a succeeding figure.

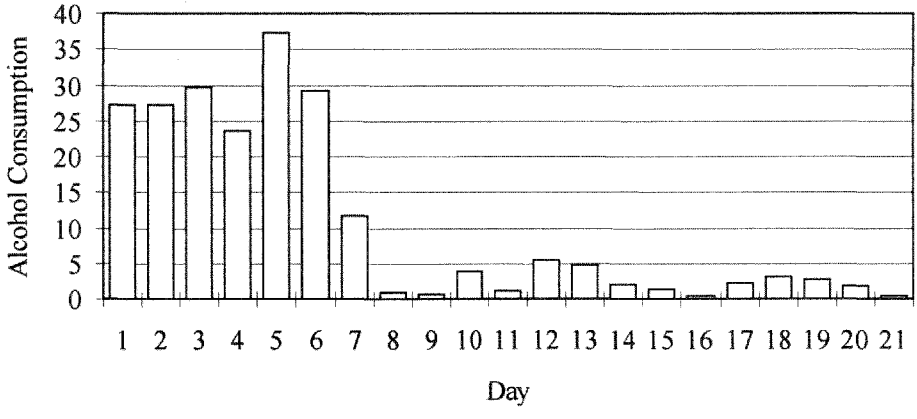

Figure 1a. Mean consumption in cl of alcohol 40% for each day of the three weeks.

As can be seen in the figure, the consumption of alcohol was high during the first week, just as expected, and then dropped to a fairly low level during the last two weeks, just as hoped.

The mean consumption per day converted to alcohol 40% for the first week was 26.6 cl, but it was only 2.7 cl and 1.7 cl for the second and third week respectively. This daily consumption the first week of the study corresponds fairly well with the stated amount of alcohol generally consumed before participating in the study (see Table 1). The low consumption during the second and third week shows the seriousness with which the subjects were trying to live up to the standards of the study.

There are some manifest characteristics in the drinking time pattern the first week. First of all a slight increase took place from Monday to Wednesday. During Thursday the consumption dropped, to increase again and it reached its highest peak on Friday. Thereafter it decreased again to Sunday. This cyclic pattern is visible

even during the second week, but with a much smaller amplitude. The third week of the study, the cyclic pattern is diffuse, drinking habits probably disintegrating.

This interesting cyclic drinking pattern is possible to analyze due to the detailed formulation of Question 33. The outcome of such an analysis is presented in Figure 1b. The number of actions combined with drinking has been weighted with the mean number of signals and the mean number of total responses per hour.

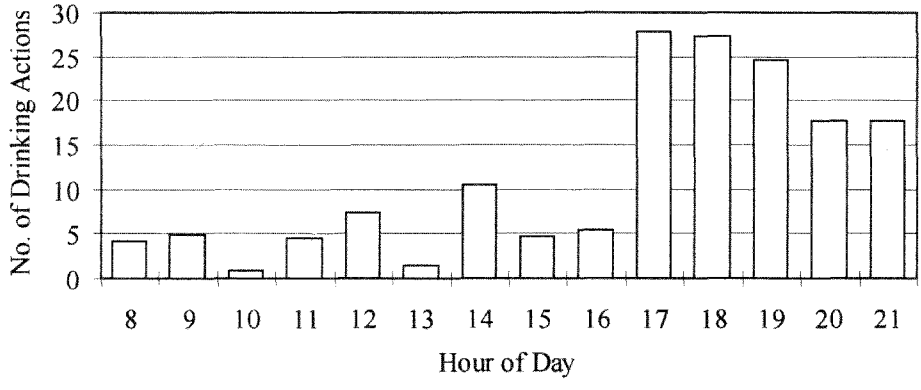

Figure 1b. Number of actions combined with drinking for each hour of the day when signals could arrive.

The pattern is essentially the same as the one in Figure 1a. The consumption increases slowly up to the middle of the afternoon and then drops. After 5:00 p.m. the consumption increases dramatically then to slowly decrease during the evening. Since morning drinking was reported it is obvious that some subjects had to take revivers.

So, there is a striking cyclicity in the drinking time pattern of the drinkers. For obvious practical and social reasons they mainly locate their drinking to evenings and week-ends. They especially seem to await coming home from work on Friday when both these conditions coincide, letting themselves go in the heaviest drinking of the week.

This drinking pattern corresponds very well with that observed in a previous study (Magneberg & Sjöberg, 1995). It would be interesting to study the drinking time pattern during holidays. It is expected to be high, like the consumption during evenings and week-ends.

The experimental design permits two important questions to be analyzed and the coming presentation in this subsection will revolve around these:

1. How did the drinkers experience themselves and the world when drinking compared with when not drinking, during the first week of the study when they still were allowed to drink?

2. How did the drinkers experience themselves and the world during the second and third week of the study, when they no longer were allowed to drink, compared with the first week?

Consequently, a division was first made of the actions during the first week of the study, between those performed during drinking and otherwise. Paired comparisons *t*-tests were computed on individual means, to eliminate the intra-individual variability. The means of variables, which differed at least at the 0.05 level of significance, are given in Table 5.

Table 5
Means of Rating Variables During the First Week When Drinking and When Not, Exhibiting Significant Differences

Variable	Drinking	Not drinking	*p*
Not thirsty	46.9	57.5	0.004
Proud	55.4	62.7	0.012
Praiseworthy	49.3	58.1	0.009
Concentrated	61.2	66.9	0.027
Active	61.0	68.6	0.040
Effective	54.1	61.5	0.021
Controlled	65.7	73.9	0.002
Skillful	56.5	63.6	0.016
Plenty of time	78.7	72.0	0.012
Estimated morality	59.8	86.8	0.001
Regrets	20.8	12.0	0.042
Importance	57.8	72.2	0.002
Positive result	63.7	78.1	0.001

Not surprisingly, when drinking, the drinkers felt less thirsty. As expected, they felt more ashamed and guilty. They were more unconcentrated, inactive, inefficient, uncontrolled and unskillful. They felt they had plenty of time, i.e., they felt more unstressed. They estimated the morality of their actions as much lower and they had more regrets about them. The importance of their actions was much lowered and they expected the actions to have less positive results.

Consistently, a division was then made of the actions between those performed during the first week and those performed during the second and third week. Here also, paired comparisons *t*-tests were computed on individual means. Variables showing significant differences ($p<0.05$) are given in Table 6.

During the two weeks when they were supposed not to drink, the drinkers were less thirsty and warmer. They felt prouder, more admiring and more praiseworthy. They perceived themselves as more concentrated and controlled. Furthermore, they rated their actions as having higher moral value and they were more free to leave

any situation. When they did not drink they rated their chances to quit their misuse as higher, the desire to drink was reduced and so was the prevalence of abstinence symptoms. Likely, those are all good reasons why they appreciated themselves more than before.

Table 6
Means of Rating Variables During the First Week When Allowed to Drink and Second and Third Week When Not, Exhibiting Significant Differences

Variable	Week 1	Week 2-3	*p*
Not thirsty	53.1	57.9	0.030
Warm	66.5	68.3	0.006
Proud	57.2	64.0	0.001
Admiring	53.4	60.2	0.001
Praiseworthy	51.2	60.3	0.001
Concentrated	62.6	67.6	0.019
Controlled	70.1	74.6	0.036
Estimated morality	78.1	87.2	0.003
Free to leave	59.4	65.5	0.009
Succeed to quit	3.27	3.57	0.010
Lack of desire to drink	3.09	3.75	0.001
Lack of symptoms of abstinence	3.61	4.03	0.001
Self-appreciation	3.21	3.68	0.001

It is interesting to notice that most of the significant variables are what could be classified as *internal*, i.e. measurements of a person's intrinsic evaluations of him/herself, in contrast to *external* variables that describe extrinsic evaluations of the ongoing activity in the surrounding world. This aggregation makes it easier to conclude, that the drinkers did not, in any decisive way, change in their attitudes towards their overt behavior while ceasing to drink, but rather experienced themselves in a more distressing way.

Further analyses of these internal variables seemed worthwhile. Questions 10-13 in the questionnaire consist of 29 preliminarily grouped *internal* variables. The intention was to include somatic and emotional dimensions, as well as cognitive and performance dimensions. A factor analysis of the individual means from both drinkers and controls gave a convincing grouping. The initial factor method was Iterated Principal Factor Analysis. The main criterion for retaining a factor was an eigenvalue >1. Rotation was made using the oblique Promax method. Explained variance in the total matrix was 78.8 percent.

The internal variables were, with the exclusion of two due to lack of psychological correspondence with the others, grouped according to the extracted factor pattern

to form six internal indices, *viz. body needs, body status, basic mood, feelings, cognitions* and *performance*. Even though the factors due to the method of rotation chosen were correlated, variables only rarely loaded high in two factors. The contents of those different internal indices were:

Index 1 (body needs)
- hungry/full up
- thirsty/not thirsty
- sleepy/awake
- tired/alert
- cold/warm

Index 2 (body status)
- ill/healthy
- tense/relaxed
- bodily discomfort/well-being

Index 3 (basic mood)
- angry/friendly
- sad/glad
- nervous/calm
- insecure/secure

Index 4 (feelings)
- frightened/brave
- ashamed/proud
- contemptuous/admiring
- guilty/praiseworthy
- surprised/confined expectations

Index 5 (cognitions)
- unimaginative/imaginative
- devoid of ideas/full of ideas
- unplanned/planning

Index 6 (performance)
- not concentrated/concentrated
- indifferent/interested
- uninvolved/involved
- passive/active
- inefficient/efficient
- uncontrolled/controlled
- unskillful/skillful

With these constructed index variables as a basis, the drinkers were compared with themselves during the week they were allowed to drink and the two weeks when they were not. Repeated measures analysis of variance (MANOVAs) were computed on individual means. For the clarity of the presentation, all the index variables are shown in Table 7.

Table 7
Means of Index Variables During the First Week When Allowed to Drink and the Second and Third Week When They Were Not

Index Variable	Week 1	Week 2	Week 3	*p*
Index 1 (body needs)	59.0	61.1	64.6	0.003
Index 2 (body status)	64.8	64.8	68.9	0.391
Index 3 (basic mood)	65.9	68.7	72.6	0.060
Index 4 (feelings)	56.6	59.7	64.3	0.002
Index 5 (cognitions)	58.3	58.3	61.4	0.546
Index 6 (performance)	64.6	64.5	68.8	0.155

The remarkable, overall result shown by these figures is that immediately the drinkers stopped drinking, they started to experience themselves in better conditions.

Their body needs shifted in a pleasant way, their basic mood improved and they started to feel much better. The improvement in performance was not as large but nevertheless quite impressive. Important questions that arise are (a) how does the experience of different significant mental levels evolve day by day? (b) how long before the drinkers reach a normal level of comfort?

Answers to those question are presented in Figure 2. The evolution of the significant index variables, during all of the three weeks of phase I in the study, are shown day by day. The equivalent horizontal lines account for mean values of control subjects. Since the variation was insignificant, lines are chosen to increase the readability of the figure.

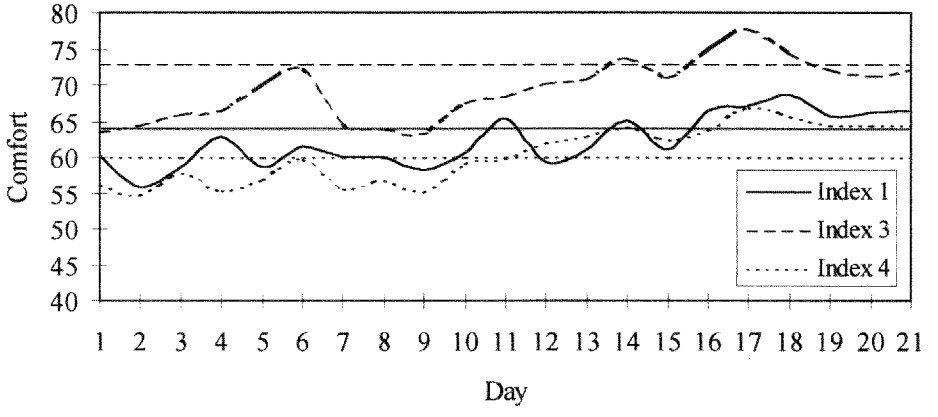

Figure 2. The evolution day by day on three indices during the three weeks of the study with the paging receiver.

The figure above is quite clarifying. The drinkers started off considerably lower than the average for normal people in every aspect. As soon as they stopped drinking they gradually improved in their internal experiences. It took only about 2-3 days of abstinence before they started to ascend. Already at the end of the first week of abstinence they felt as good as normal people, with a peak in the middle of the third week. No abstinence symptoms can be detected, only ascending fluctuations. In the light of how rapidly the recovery went, it seems strange that drinkers normally drink as they do.

Drinkers versus normal people

The objective of collecting control data is of course to be able to evaluate in what aspects an experimental group differs from 'ordinary people'. In the previous subsection the drinkers were compared with themselves in different ways. Once the effect of the treatment has occurred, i.e. after the day of drinking cessation, it

is not meaningful to compare the drinkers with the controls, but rather with themselves, which is already done. Thus, in the following subsection different comparisons will be made between the drinkers during the first week of phase I and the controls, who as mentioned earlier only participated for one week.

The first explorative attempt will be frequency analyses of the different actions the subjects were involved in when the signal arrived, both main and secondary actions. The outcome of such an analysis is shown below in Table 8.

Table 8
Percentage of Different Actions for the Drinkers and the Controls

	Drinkers		Controls	
Type of action	Main	Secondary	Main	Secondary
Paid work	19.5	0.5	28.2	3.4
Break, waiting	1.7	0.9	3.2	0.7
Housework	9.8	1.4	9.3	1.9
Eating, drinking etc.	6.9	4.4	7.4	4.4
Rest, sleep	3.0	0.3	1.3	0.3
Inactive	0.9	0.9	0.3	0.6
Personal hygiene	2.5	0.2	2.2	0.5
Personal beautification	0.6	0.3	0.6	0.1
Care of children	1.2	1.9	1.9	2.1
Care of pets	1.7	0.2	0.3	0.1
Running an errand	5.1	0.5	2.8	0.4
Health care	0.6	0.2	0.2	0.1
Repair work	0.3	-	0.8	-
Education	4.0	-	0.9	-
Acquiring information	3.4	2.5	4.2	2.6
Relationship with others	5.9	9.2	9.4	12.8
Relationship with partner	0.2	0.2	0.3	0.3
Recreation, relaxation	13.2	6.7	10.3	9.4
Places of entertainment	0.5	-	1.0	-
Special hobbies	5.0	0.3	2.7	0.9
Walks, exercise	1.6	0.2	1.5	-
Voluntary work	0.2	-	0.7	-
Club, church activities	0.2	0.2	0.7	0.1
Smoke-actions	0.3	1.9	-	-
Drinking alcoholic beverage	3.4	6.9	-	-
Transportation	7.3	0.3	9.1	0.2
Writing letter, diary	0.4	0.2	0.7	0.4
No real actions	0.6	-		
No answer	-	59.7	-	58.7

There are some easily detected differences. But to make the data more readable, the different action categories in Table 8 are grouped and ordered according to the categories utilized by Klevmarken (1986). Thus, a more aggregated comparison between the groups is shown in Table 9 along with time allocation.

Table 9
Time Allocation to Perform Different Categories of Actions

	Drinkers		Controls	
Action category[a]	Main[b]	Secondary[b]	Main[b]	Secondary[b]
1 Market work	21.2	1.4	31.4	4.1
2 Household work	9.8	1.4	9.3	1.9
3 Care and sleep	16.8	8.2	14.0	8.1
4 Shopping	5.7	0.7	3.0	0.5
5 Repair and maintenance	0.3	-	0.8	-
6 Educational activity	7.4	2.5	5.1	2.6
7 Pleasure and recreation	30.5	25.6	26.6	23.5
8 Travel	7.3	0.3	9.1	0.2
9 Other communication	0.4	0.2	0.7	0.4
10 Miscellaneous	0.6	59.7	-	58.7

[a] Klevmarken's categories.
[b] Percentage of 14 hours.

This level of aggregation makes it easier to see the differences in action frequencies between the drinkers and the controls. The drinkers spent less time in activities like 'Market work' and 'Travel' than did the controls and instead more time in activities like 'Care and sleep' and 'Pleasure and recreation'. It is interesting to notice that in approximately 40 percent of the cases, both the drinkers and the controls were doing something else at the same time as the primary action.

It is remarkable to find that even though drinking only occurred in 3.4 percent of all cases as the main action during the first week, it occurred as a secondary action in 6.9 percent of all cases. In addition, it occurred as 'something one consumed while doing other things' in 13.4 percent of all actions. This means that the average drinker was involved in drinking behavior 24 percent of his/her time during 8:00 a.m. and 22:00 p.m., i.e. approximately 3½ hours out of 14. But little attention was obviously paid to this activity, considering how it was classified. The different kinds of actions the drinkers were engaged in while drinking can be seen in Table 10 in order of occurrence.

Not surprisingly, actions connected with recreation accounted for more than one third of all actions performed during drinking. Housework, relationship with others and eating and drinking almost accounted for the next third. Drinking is apparently linked with 'taking it easy and enjoying life', i.e. a hedonistic type of lifestyle. The next analyses will deal with the whereabouts of the drinkers. The results are presented in Table 11.

Table 10
Percentage of Different Types of Actions Performed While Drinking

Type of action	Percentage
Recreation, relaxation	35.9
Housework	11.7
Relationship with others	10.9
Eating, drinking etc.	8.6
Special hobbies	6.3
Running an errand	4.7
Acquiring information	3.9
Walks, exercise	2.3
Paid work	2.3
Care of children	2.3
Education	2.3
Transportation	1.6
Rest, sleep	1.6
Inactive	1.6
Care of pets	0.8
Relationship with partner	0.8
Repair work	0.8
Personal beautification	0.8
Personal hygiene	0.8

Table 11
Percentage of Locations Showing Where the Drinkers and the Controls Were When the Signals Came

	Drinkers		Controls
Location	All actions	While drinking	All actions
Home	49.4	78.4	39.8
Place of work	24.5	2.7	32.8
Means of transportation	6.9	2.7	6.4
Home with acquaintances	4.1	6.8	5.2
Outdoors	6.1	3.4	5.0
Place of entertainment	1.1	2.7	2.2
Hospital	0.8	-	0.4
Club premises	0.5	-	0.6
Church	0.6	1.3	0.2
Official building	0.3	-	-
Other premises	5.7	2.0	7.4

The first question is if the locations of the drinkers differed in general from those of the controls and the second question is where the drinking typically took place. Compared with the controls the drinkers spent considerably more time at home and less time at working-places. When drinking, they were almost exclusively at home.

An over-all comparison of rating and index variables between the drinkers and the controls during the first week of phase I, when drinking was allowed, is of course of greatest interest. However, comparisons between the drinkers and the controls regarding intoxicated time periods and less intoxicated time periods must be of even greater interest. Since 75 percent of all actions with alcohol connection took place during evenings and another 11 percent took place during week-end day-time, a division between working-hours and time off seems sensible.

Accordingly, data were divided into actions performed during working-hours, 8:00 a.m. to 5:00 p.m. Monday to Friday, and actions performed during the evenings and Saturday and Sunday. Separate analyses based on this time-division of actions were computed, i.e., the individual means of all rating and index variables for the drinkers were compared with those of the control subjects using *t*-tests. Since the number of subjects was less then the desired 40, this influences the significance of the comparisons in a negative direction, without really changing the overall results. Because of the importance of this type of analysis, the level of significance chosen here is <.1. All of the index variables are also accounted for because of their special interest. The results are given in Table 12.

During working-hours, the drinkers were externally engaged in actions with longer duration than the actions of the control subjects and they thought they had more time to their disposal, i.e., they were less stressed They perceived to a higher extent that their actions were the result of their own initiative and had little desire to do something else. Internally, they were more tense and nervous than the controls, and they felt more insecure and guilty. Essentially, their body status was worse and their basic mood was lower in comparison with the control subjects.

During time off, the drinkers were associated with fewer people than the control subjects. Even now they were engaged in actions with longer duration than the controls. The estimated morality of their actions was lower than that of the controls and they had more regrets about them, but they still perceived their actions to be the result of their own initiative. Furthermore, they rated their actions as more common than the controls did, and did not perceive them to produce a very positive results. What they did was not so pleasant and they did not experience themselves particularly free to leave the situation. Internally, they were more thirsty and experienced themselves as less healthy, less relaxed with more bodily discomfort than the controls. They felt more contemptuous, more nervous, more insecure and more guilty than the controls. Furthermore, they were not very interested in what they were doing. Essentially, their body needs and body status were worse and their basic mood was lower than that of the control subjects.

Table 12
Means of Rating and Index Variables for the Drinkers and the Controls During Working Hours and Time Off During the First Week Exhibiting Significant Differences

	During working-hours			During time off		
Variable	Drinkers	Controls	*p*	Drinkers	Controls	*p*
Rating variables						
Not thirsty				53.1	62.3	0.041
Healthy				69.2	78.2	0.058
Relaxed	60.1	68.6	0.076	64.8	76.6	0.004
Bodily well-being				62.6	70.8	0.071
Admiring				53.5	59.1	0.068
Calm	65.0	72.6	0.074	67.8	78.3	0.004
Secure	64.8	74.5	0.031	65.1	75.3	0.012
Praiseworthy	50.9	59.1	0.018	51.4	60.3	0.010
Interested				65.5	72.1	0.060
Plenty of time	64.7	54.3	0.005			
No. of others present				2.36	4.21	0.052
Duration of action	2.43	2.03	0.003	2.59	2.26	0.001
Estimated morality				75.4	86.1	0.009
Regrets				17.1	11.4	0.092
Own initiative	79.9	70.0	0.003	82.2	73.1	0.002
Do something else	37.1	46.2	0.055			
Common				72.1	65.0	0.012
Positive result				70.1	77.1	0.019
Pleasantness				71.5	75.9	0.081
Free to leave				62.3	73.3	0.004
Index variables						
Index 1 (body need)	60.0	61.9	0.632	58.1	63.9	0.121
Index 2 (body status)	63.4	69.4	0.162	65.5	74.9	0.023
Index 3 (basic mood)	64.8	71.3	0.101	66.4	74.8	0.019
Index 4 (feelings)	56.6	58.7	0.508	56.4	60.2	0.217
Index 5 (cognitions)	61.7	60.1	0.661	56.5	59.7	0.338
Index 6 (performance)	67.2	70.1	0.281	62.6	66.0	0.269

Note. For a more extensive explanation of the index variables see page 181.

The post-study interview

The distinction between misusers and abusers of alcohol made prior to the study, was further elucidated during the interviews with the participants in the experimental group. It was confirmed beyond doubt, that the category of misusers is meaningful. According to the diagnostic classifications in APA (1994) pathological use is categorized as either Psychoactive Substance Dependence or the residual diagnosis of Psychoactive Substance Abuse.

The misuser knows, quite unerringly, that he is not an ordinary user, but does not, quite rightly, regard himself as an abuser. He is afraid to seek help, because, quite surely, he will be regarded as an abuser. An account for different characteristics of the misuser, contrasted with those of the abuser, are presented below in Table 13. The characteristics of the abuser correspond to some of the criteria enumerated in WHO's International Classification of Diagnoses, ICD-10.

Table 13
Some Characteristic Differences Between Misusers and Abusers of Alcohol

The typical misuser ...	The typical abuser ...
plans his drinking both with regard to time, place and quantity and can stop drinking, even if there is more to drink.	can not stop drinking once he has started and drinks until all to drink is finished or he falls asleep.
thinks he remembers the last night accurately, when in fact he has blurred and incorrect memories of what really happened.	has black-outs and can not remember anything after a certain point of time the day before.
carries the hang-over with a kind of stoic attitude during the next day and rewards himself with a drink the first thing he does in the evening after work.	needs to take revivers after waking up to be able to handle the hang-over.
drinks to get into a good mood and to be relaxed.	drinks to reach release from anxiety and hopefully attain euphoria.
drinks cyclically, with a distinct day- and week-pattern.	drinks periodically, with a period of non-stop drinking followed by non-drinking.
is particular with brands and not seldom a wine-lover.	mixes all kinds of drinks, the stronger the better.
is fairly anonymous and receives only in exceptional cases help from outside.	soon finds himself in registers at health-care, social welfare and police authorities
gradually becomes more unsociable, i.e., the relations with family, fellow-workers and ordinary people get more strained.	gradually becomes more asocial, i.e., he looses his spouse, job, driving license etc.
gradually becomes more aware of his problem with increasing disadvantages and the fact that he has to do something about it.	denies any kind of personal problem and tends to blame the alcohol itself, or regard himself as medically ill.

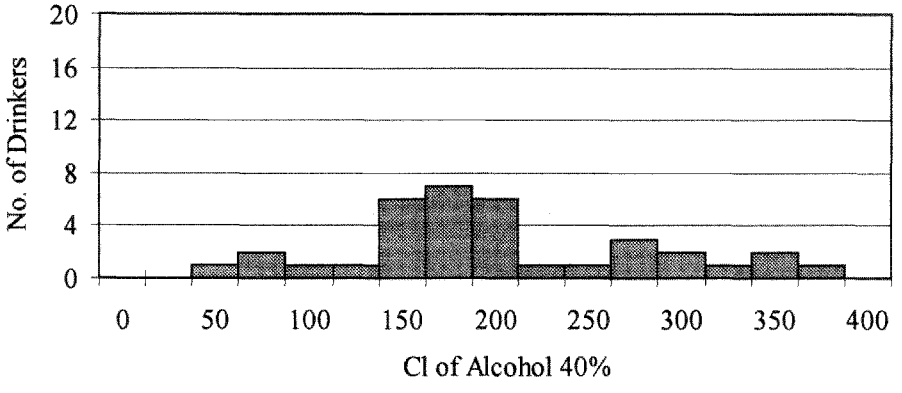

Figure 3a. The amount of alcohol consumed before the study began (*N*=35).

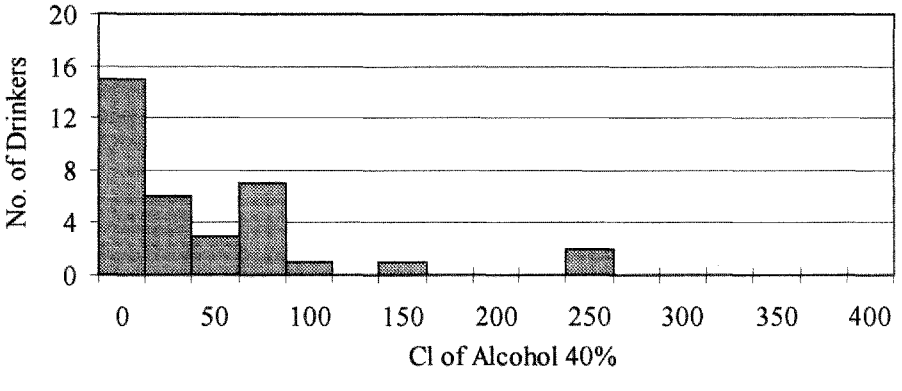

Figure 3b. The amount of alcohol consumed one month after Q-day (*N*=35).

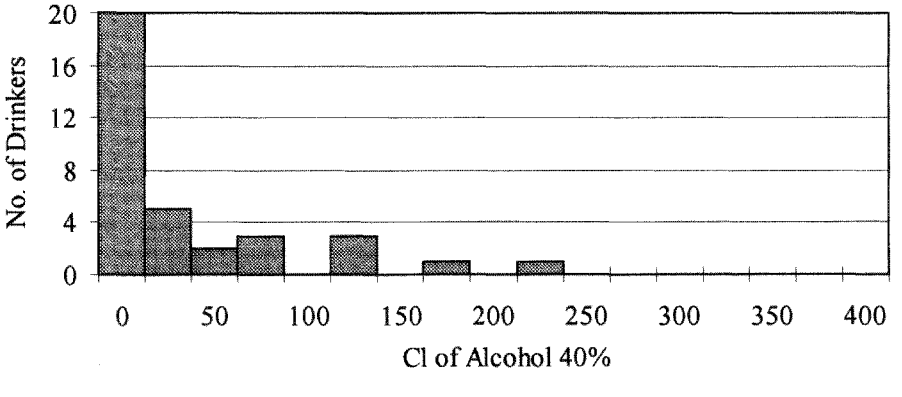

Figure 3c. The amount of alcohol consumed one year after Q-day (*N*=35).

The one-year follow-up

During the year following the day when the drinkers were supposed to quit drinking (Q-day), five questionnaires were sent to the subjects, with a mean interval of 12 weeks. The questionnaire contained 10 questions (see Appendix C2), the most important one being how much alcohol had been consumed during the preceding week. To get an impression of the degree of success with their good resolutions, Figures 3a-3c are presented above showing how much alcohol was consumed prior to the study, how much one month after Q-day, and finally how much that was consumed one year after Q-day. All alcoholic beverages have been recalculated to cl of alcohol 40%.

The consumption of alcohol prior to the study was substantial. One month after Q-day approximately 43 percent did not drink at all or "just a little glass now and then". The result after one year was even better. Up to that point the outcome of the study must be considered quite remarkable.

Since the aim of the intervention was to help people control their alcohol consumption, not necessarily to quit, the proportion of consumption is of great interest. Figure 4 shows the percentage of original consumption of alcohol, for those still drinking. Amount of drinking fluctuated around a mean value of 38 percent. However, as in Figures 1a-1b, a cyclic drinking time-pattern is detected, form 3 arriving to the drinkers in the middle of the summer.

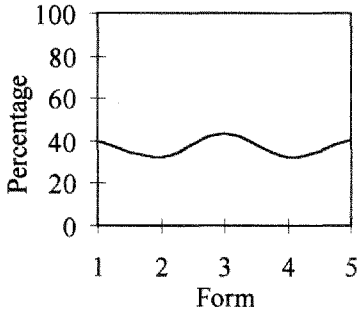

Figure 4. Percentage of original consumption of alcohol for those still drinking during the year of the follow-up.

A division is made between those 20 subjects who can be considered successful quitters and the 15 less successful quitters. The term 'successful quitters' denotes drinkers who have stopped using alcohol completely, or have changed from the category of misusing to the category of using alcohol, while a 'less successful' quitter refers to the rest of the drinkers. Changes for 6 dimensions of interest during the year of the follow-up are shown in Figure 5.

First, concerning the physical condition, there was no big difference between the drinkers who continued to drink and those who did not, except for a down-period after six months, linked to more drinking as shown in Figure 4. The difference in mental condition was also rather small, but in favor of the non-drinkers.

Further, the curves of the abstinence symptoms show interesting differences. After six months the abstinence symptoms for the non-drinkers increased. But they did not give in to them. Those who did of course reduced their abstinence symptoms in a corresponding way.

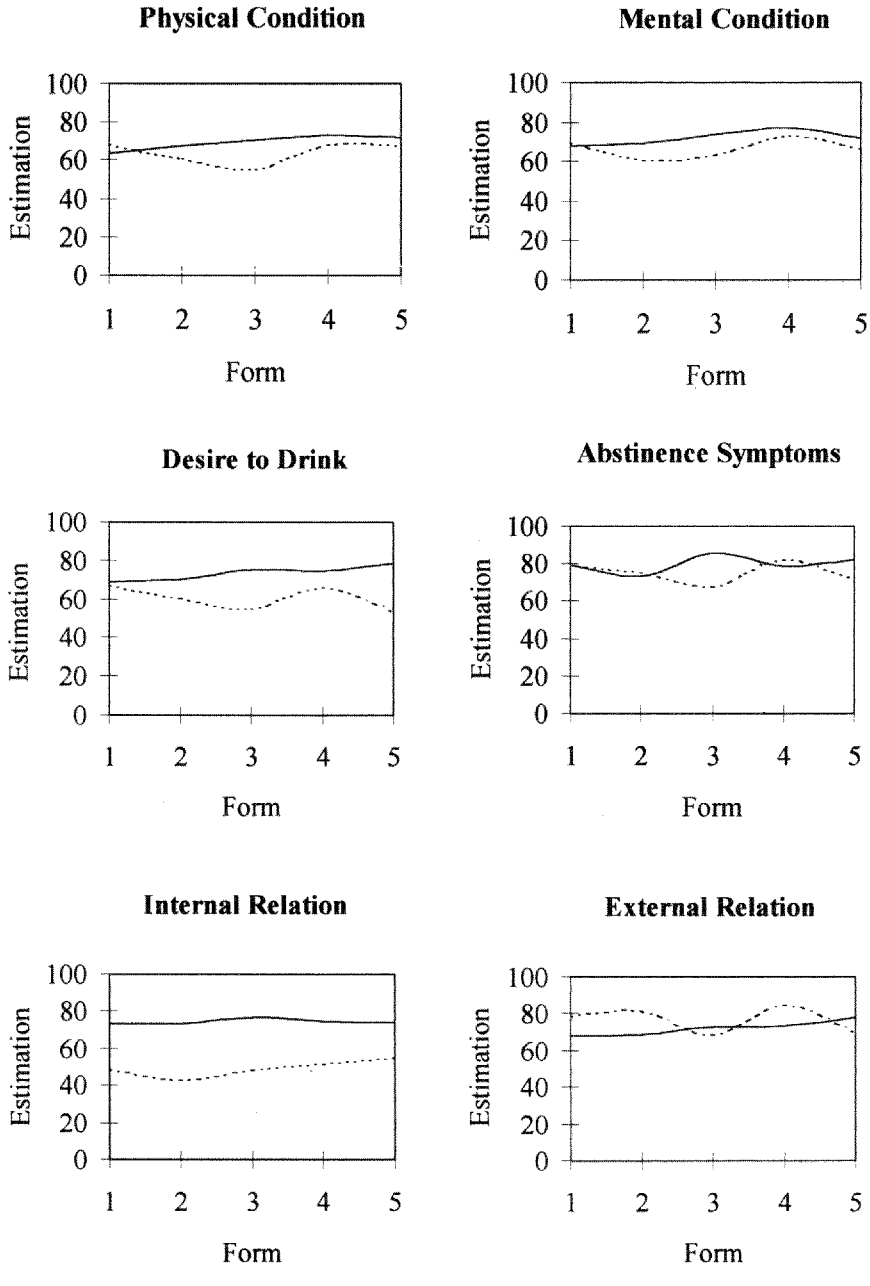

Figure 5. Some differences between successful quitters (——) and less successful quitters (- - -) during the year of the follow-up.

The desire to drink does not reflect the abstinence symptoms very much, but instead a slightly increasing trend for the non-drinkers and a decreasing one for the those who continued to drink was observed.

Finally, the difference in quality of the relation to people around was not very large in terms of means. However, the successful quitters experienced a slowly, but steady improvement, while the less successful quitters showed a fluctuating pattern, with worsening external relationships during the more extensive drinking after six months. On the other hand, the difference in self-appreciation related to the ability to handle one's desire to drink, is quite visible. The successful quitters rated themselves much higher than the less successful.

Gender differences

There are many ways to analyze the available data, gender-differences being one of particular interest. Who performed the best, the average drinking woman or the average drinking man?

First, the male and the female drinkers were compared during the first week of the study, to see if they differed in any important aspect to start with. A number of *t*-tests were computed on individual means, but only two variables had an acceptable level of significance ($p<0.05$). The male drinkers were much more full of ideas, but they experienced to a greater extent than the female drinkers, that their action hindered achieving other goals. On a significance level <0.1, the female drinkers felt more tense, more guilty, and were more stressed, and they did not like performing the action as much as the male drinkers.

Male and female drinkers did not drink equally much prior to the study. According to their estimations, the females drank on the average 24 cl of alcohol 40% a day and the males 33 cl. This means that the females drank approximately 75 percent of what the males drank, which corresponds fairly well to the difference in weight between the genders. During the first week of the study, the females drank on the average 22 cl per day and the males 27 cl, which is only 14 percent lower than their initial estimates. During the second and third week, the females drank on the average 2.0 cl per day and the males 2.9 cl. This corresponds to around 90 percent reduction for both genders, which must be considered very good. In this respect there was no difference between genders.

One month after Q-day, 6 males and 9 females had been drinking very little during the pervious week. One year after Q-day, 11 males and still 9 females had been drinking very little during the previous week. The line of demarcation was set to 12.5 cl of alcohol 40% per week, which corresponds to a bottle of weak beer[3] a day, and around 5 percent of the original consumption.

During the year of the follow-up, there was an interesting gender difference in the drinking pattern for those who drank more than just a little. As can be seen in Figure

[3] 'Lättöl.'

6, the females oscillated much more than the males. This figure indicates that the cyclic drinking time-pattern during the year is more pronounced for the women than for the men. The average consumption was the same for both genders, around 37 percent of the initial level.

If the male and female non-quitters are compared during the year of the follow-up, four of the dimensions presented in Figure 5 show very similar patterns. The remaining two dimensions indicate gender related differences and are presented in Figure 7. Apparently, the physical and mental condition of both male and female non-quitters seemed to be rather stable during the year, the females feeling better in both aspects than the males.

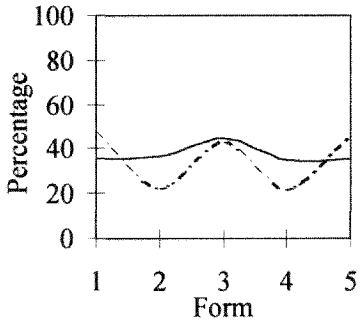

Figure 6. Percentage of original consumption of alcohol per week for male (—) and female (- -) drinkers.

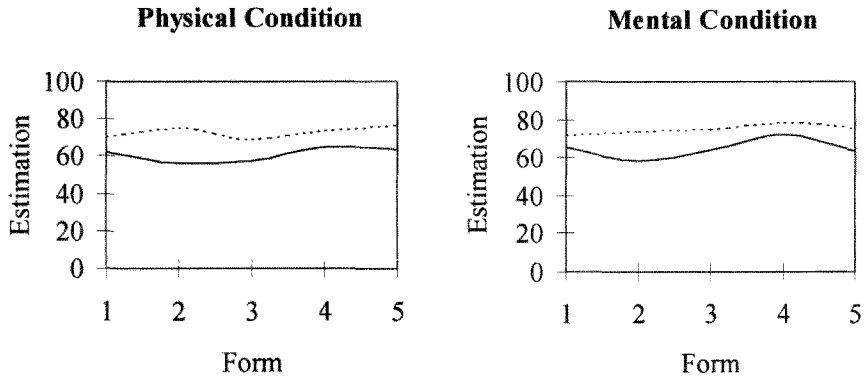

Figure 7. Changes in physical and mental conditions during the year of the follow-up for male (—) and female (- - -) drinkers.

The use of strategies

The key to success when trying to control drinking is of course dependent on many factors, the usage of different kinds of strategies being one. The drinkers were prepared for the necessity of conscious diversions of the desire to drink and encouraged to develop idiosyncratic ways of dealing with it. The aim of these strategies would primarily be to resist the craving for alcohol and secondarily to canalize the energy into more constructive mental activities and actions.

At the end of the one-year follow-up 20 drinkers were successful in abstaining from drinking. First, those successful quitters will be compared with the less successful quitters as to the number of strategies they used during phase I, respectively phase II. The outcome of this analysis is shown in Figure 8 below.

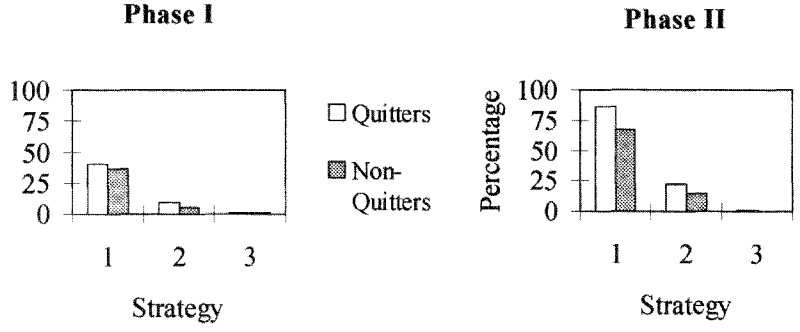

Figure 8. The percentage of time that strategies on different levels were used by the successful quitters compared with the less successful quitters during phase I and phase II.

Second, the successful quitters were compared with the less successful quitters as to what *kinds* of strategies they used during phase I and phase II. This in turn is shown in Figure 9 below.

When it comes to the kinds of strategies used during phase I, the successful quitters seemed to sleep more, do more body-caring and work it out more in cognitive ways than the less successful quitters, who seemed to be a lot more active and to work and consume a little more. The successful quitters stood for 60 percent of all reported strategies.

During phase II the successful quitters stood for 55 percent of the reported strategies, but the number of reported strategies was much smaller. The successful quitters still seemed to sleep more, but now they were also a lot more active. The less successful quitters in turn were still working more, but they now worked a lot more in cognitive ways. Being 'Active' seems to have been the major strategy for trying to cope with the desire to drink for both the successful and the less successful quitters. For a more detailed account for the categories here mentioned see Appendix D.

The five-year follow-up

How stable was the success rate in the present study? The participants were approached again with a letter and a simple questionnaire five years after Q-day. 74 percent were possible to locate. A summary of their drinking habits are shown in Figure 10.

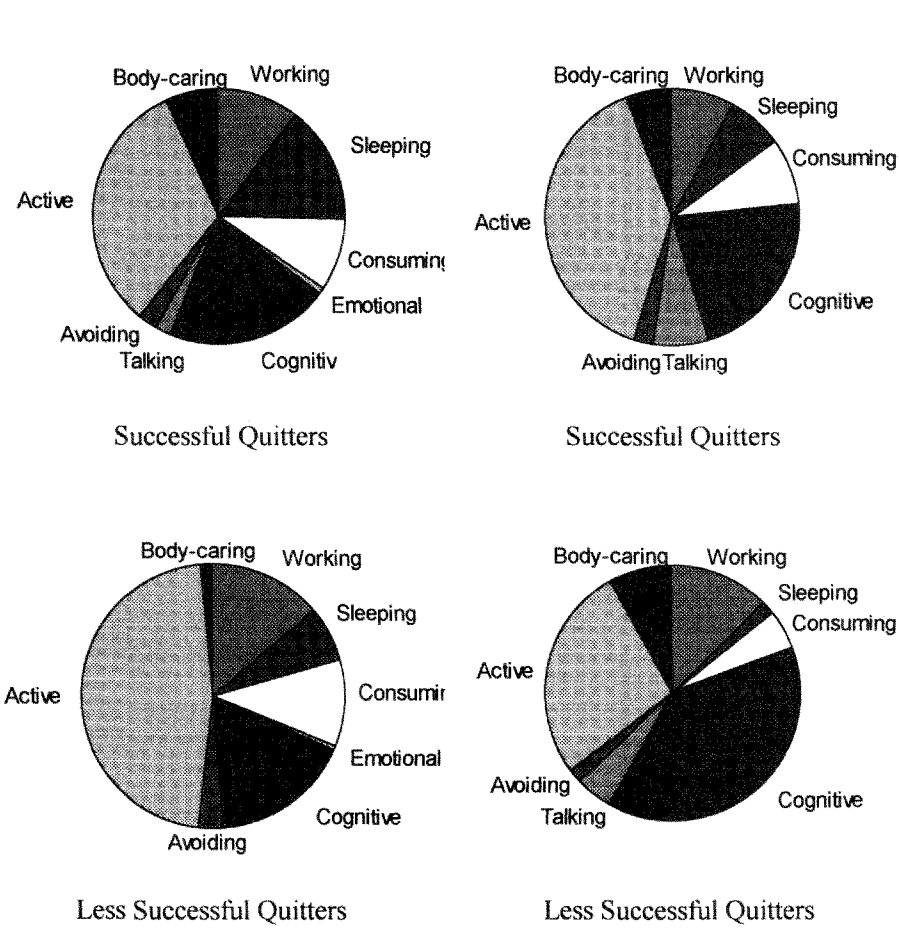

Figure 9. The kinds of strategies used by the successful quitters compared to the less successful quitters during phase I and phase II.

Compared with Figures 3a-3c (see page 189), there are some interesting differences. As hoped, a significant proportion of the participants in the study, namely 27 percent, practically did not drink at all. The average drinking of the remainders was 97 cl alcohol 40% per week, compared with 203 cl prior to the study. This means an average 52 percent reduction of alcohol consumption.

However, the gender differences were most significant and even more interesting. The mean consumption per week was 31 cl for the females and 140 cl for the males, for those drinking. Prior to the study, the females drank 170 cl and the males 228 cl of alcohol 40%. This means 82 percent reduction for the females, compared to a 40

percent reduction for the males. Those who prior to the study had set the goal only to reduce their drinking were over-represented among the best performing half.

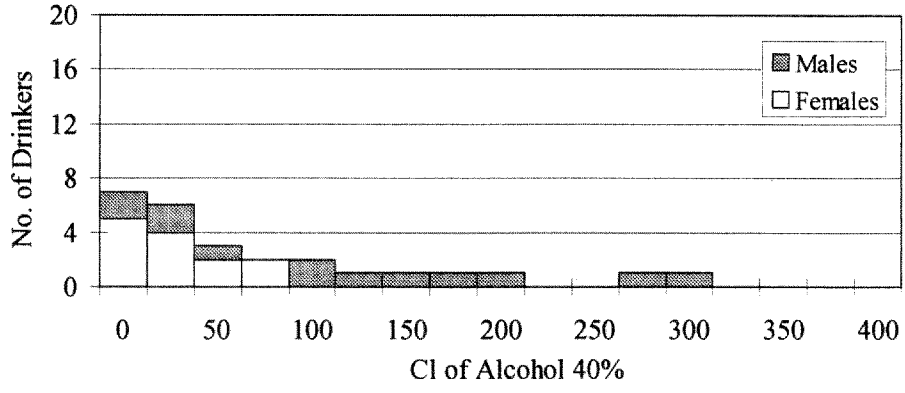

Figure 10. The amount of alcohol consumed per week five years after Q-day (*N*=26).

DISCUSSION

Alcohol is a socially accepted drug, but its extensive use results in a considerable cost for society. Estimates from different countries point to a cost of 5 percent of GNP (Rice *et al.*, 1990). The expenses related to over-consumption of alcohol are linked to costs for medical treatment and social welfare, costs for reduction of productivity due to illness and premature death, costs for alcohol-related crimes and traffic accidents and costs for alcohol-related social problems. The total of these costs for Sweden 1990 was estimated to 100 billions SEK (Johnson, 1991), which at that time was around 7 percent of the Swedish GNP.

According to the Model of Total Consumption, the damages and the costs in a society are positively correlated to the total consumption of alcohol. The model is based on the fact that the consumption of alcohol is unevenly distributed in the population. This means that a small sub-group of the population is responsible for a large proportion of this consumption. With an increasing average consumption in a society, the number of heavy consumers increases and with them the connected damages and costs. The model is built on a large number of international studies (Olsson, 1990). A 'European Alcohol Action Plan' based on the model has been agreed upon by the European region of the WHO. The aim is to lower the average consumption in the countries.

In a health perspective, different kinds of measures can be taken to limit the damaging influences of alcohol. To begin with, they can focus on the individual

person (the alcohol consumer) with information, advice and treatment. They can also focus on the agency (the alcohol) concerning accessibility, alcohol-strength and size of package. Finally, they can focus on the environment (the society) regarding license to serve alcoholic beverages, education of waiters, local rules and percentage of alcohol in the blood.

Of the total consumption of alcohol in Sweden during 1993, the consumption of beer roughly accounted for 40 percent and wine and liquor for 30 percent each (CAN, 1994). The trend is decreasing for liquor, stable for wine since some ten years back and increasing for beer. When it comes to the *number* of liters of alcoholic beverages consumed, one must keep in mind, that spirits is around 8 times stronger than strong beer, which means the inverse ratio in quantity. On top of this comes an estimated 30 percent of unregistered alcohol consumption, which comes from home-manufactured beverages, consumption of technical spirits, consumption in connection with travels abroad and privately imported beverages from those travels. One can expect the heavy drinkers to consume the largest portion of those alcoholic beverages.

The main findings of the present study will briefly be summarized. In the first set of analyses the drinkers were compared with themselves. During the first week of the study when they still were allowed to drink, there was a noticeable difference in the way the drinkers experienced themselves and their actions while drinking and not. When drinking, they became more unconcentrated, inactive and inefficient. This is the pattern of a relaxing person. However, the conduct had a price in moral apprehensions.

The changes in life experience during the weeks when they were supposed not to drink were dramatic. Quality of life began to improve almost immediately. The factor analysis of the internal variables shows that the major shifts occurred in body needs and feelings, which is not surprising, but the basic mood was also affected. In the light of these improvements, it is difficult to understand why the drinkers keep suppressing themselves.

In the second set of analyses the drinkers were compared with the non-drinkers. The largest difference between the two categories concerning what they were doing with their time, was that the drinkers were substantially less involved in work-actions than were the non-drinkers. Even if the drinkers, due to unemployment, only worked 88 percent of what the controls did to start with, the actual amount of work-actions was only 68 percent of the latter. Instead they were more involved in pleasure, recreation, care and sleep, i.e., a hedonistic way of life. This can only be explained by the fact that the drinkers did not spend as much time at work as they said and should have. Instead they were at home.

Let us now turn to the major differences between drinkers and non-drinkers. Both during working-hours and during time off, the drinkers experienced themselves worse regarding body status and basic mood. During time off, body needs became more acute for the drinkers, but improved for the controls. In other

words, the drinkers probably experienced a lower life-quality than the controls, both when drinking and when not.

As mentioned before, the drinkers performed well during the first phase of the study concerning drinking cessation. The goal was to control drinking. For some drinkers this meant to quit completely, for others to reduce drinking. However, none of the drinkers were to drink during the second and third week of phase I. Then came phase II. To begin with the less successful quitters, they obviously fought a prolonged and unmerciful battle against their desire and abstinence symptoms. However, the trend was not to go back to the pre-study level of consumption of alcohol. A stabilization occurred at the 40 percent-level. This means that the commitment of the drinkers was still intact and influenced their behavior both in a motivational and moral way. Turning to the successful quitters, one month after Q-day, approximately 43 percent of the drinkers practically did not drink at all. This number increased to 57 percent after one year.

When it comes to gender differences, the impression is that both genders performed fairly well, even if their patterns differed somewhat. During the weeks when they were supposed not to drink, there was no significant difference, both genders succeeding very well. One month after Q-day 60 percent of the women practically did not drink at all compared with only 30 percent of the men. However, one year after Q-day, the men had increased their success rate to 55 percent, while the women had stayed at the same level. Finally, the most interesting difference, during the year of the follow-up, was the difference in the drinking fluctuation pattern for those still drinking. In spite of the fact that they were in phase with each other, the amplitude of the women's fluctuations was significantly higher. Here we have another interesting cyclic drinking-pattern.

Diversion of desire and nervous energy would be expected to play an important part in any kind of drug-cessation. One would expect the struggling drinkers to have at least one clear-cut strategy at hand whenever the symptoms became severe. Surprisingly enough, the successful and the less successful quitters seemed to use just as many strategies during phase I. During phase II the less successful quitters decreased their use of strategies a little. The kind of strategies used also differed a little. The successful quitters seemed to have slept more during phase I, a time instead spent in activities during phase II. The less successful quitters changed from being quite active to indulging in more cognitive types of strategies.

Finally, the long-term results of the study are most interesting. There are some distinct gender-related differences. After five years, none of the women could be regarded as a heavy drinker any more and most of them must to be considered normal users of alcohol. However, only a few men could be considered as normal users of alcohol. Most of them were drinking a lot more than normal users, but still only 2/3 of their original consumption. The fact that female drinkers succeeded so much better than male drinkers is most remarkable and not easily ex-

plained. In one sense, the female drinkers in the study could be considered more heavy drinkers than the male drinkers to start with. This is due to the fact that females normally drink around 40 percent of what males drink (CAN, 1994), but in the present study they drank 75 percent of what the males drank. Or maybe there is an actual difference between female and male *users* and *misusers* in this sense.

To get an unambiguous picture of success rates for different cessation programmes is very difficult. Different researchers reach quite divergent conclusions. Rasmussen *et al.* (1990) draw a picture of the effects of treatment of alcoholism which is characterized by pessimism and insecurity. Miller and Hester (1986) found in their review of 900 studies, that it is reasonable to expect a spontaneous quit rate of up to 20 percent over a period of 1-2 years. They also found that some cessation programmes were more successful than others, e.g., self-control training. Finally, Polich *et al.* (1980) found that approximately 90 percent of persons treated for alcohol problems experienced those problems also four years afterwards. In the light of these findings, the long-term success rate of the present study must be considered quite promising. However, one should bear in mind that the prognosis for treating alcohol abusers is probably much less favorable than training alcohol misusers to abstain. Comparable data of success rate for this latter category are not available.

One of the major findings of the study was the *cyclic* drinking time-pattern. The ordinary user of alcohol probably does not have such a distinct pattern, but is more likely to have an *occasion* drinking time-pattern. The fundamental reason presumably underlying the cyclic drinking time-pattern, is the fact that it is customary in our society to drink alcoholic beverages during time off and not during working hours, except maybe for a beer at lunch. This means that a more habitual drinker will adjust his drinking to his leisure time, i.e., evenings, weekends, holidays and vacations. Occasion drinkers presumably also drink more during vacations and holidays, so the really important features of the cyclic drinking is a very distinct day and week time-pattern. The *periodic* drinking time-pattern, finally, represents extremely severe drinking, which can be regarded as a 'none or all' drinking. More research on the differences between cyclical and periodical drinking is considered very important, from both a practical and a theoretical point of view. Illumination of the differences between the cyclic drinking time-pattern between genders would also be very welcome.

Another highly interesting finding of the study was the outcome of the analyses of the question measuring the stress-level (No.13:6). It did not group with the other variables in the factor analysis. Instead it should to be treated as a very important variable of its own. When the drinkers were compared with themselves, the stress variable was *the only one* that indicated a change for the better when drinking. Stress can be looked upon in various ways, but the only property emphasized here will be the time dimension. Stress is undoubtedly linked to the

effortful maintenance of an activity. If one liberates oneself from the passing of time, one releases oneself from the urgency of the task just being performed, from tomorrow's obligations and from the speed of life. This is an angle of the intrinsic motivation for drinking, well worth continued research.

Addictive behavior is usually associated with abuse. In an attempt to improve the theoretical constructs in this important field, a further discrimination is advocated here. Addictive behavior is per definition repetitive and undesired. However, a lot of our behavior is repetitive but not undesired, until, according to some reference norm, the cost of the behavior is out of proportion compared to the benefit. Thus, the common denominator of all addictive behavior is that people, in order to get their 'kicks', are willing to pay a high price in a physical, psychological, social or monetary form, or a combination of those. It is emphasized here, that any human activity or any substance that people ordinarily consume can become the object of addiction. The notorious shoplifting wife of a rich judge is conducting an addictive behavior, and so is the habitual drinker.

No doubt, there is a significant proportion of the population that hardly consumes alcohol at all. The habits of drinking in the culture in general and the habits of drinking in one's own socio-economic layer in particular make a certain consumption customary, both in regard to quantity and type of alcoholic beverage, i.e., beer, wine or liquor.

In the present study, a rough discrimination between at least three categories of alcohol consumers was made: *users*, *misusers* and *abusers*. First, the user is a temporary alcohol consumer, in control of his consumption, preferably using weak alcoholic beverages, in quantities below that of a bottle, unless maybe it is beer. This person seldom goes to 'Systembolaget[4]' and when he or she drinks, it is more likely to be in restaurants or at parties. This is the typical 'nice-occasion-drinker'. The misuser is more likely to be a 'one-bottle-of-wine-an-evening-drinker', while the abuser is more likely to be an 'out-of-control-drinker'.

Of all the people who start drinking alcoholic beverages, the majority will remain ordinary users. However, approximately 20 percent of the users will become misusers (Engs & Hanson, 1985), and out of those around 20 percent will become abusers. This means that approximately 4 percent of the population can be expected to become abusers of alcohol. Statistics to back up those figures are very hard to present, because of differences in definitions of the syndrome of alcohol abuse. As a rule of thumb, at least they give an idea of the type of distribution we are dealing with.

The emphasized distinction between users, misusers and abusers is not an artificial one. The ordinary user is *not* on his way to becoming a misuser, just as the ordinary misuser is *not* on his way to becoming an abuser. The ordinary user or misuser has found his niche and stays there. Certainly it is true that the abuser has once been a user and a misuser, but it is not true that the ordinary user is on

[4] The Swedish Alcohol Retailing Monopoly.

his way to becoming a misuser, just as the ordinary misuser is not on his way to becoming an abuser. Because of a prevailing lack of nuances in the attitudes concerning the use of alcohol, both from practitioners and theorists in the field, making a distinct difference between misusers and abusers must be regarded as being of the utmost importance. In the present study the typical misuser was in focus. Even if about a third of the participants had had outside help with some alcohol-related problems, no one who could be regarded as an abuser was given admittance to the study.

Methodologically, the approach taken differs from earlier studies in a few important aspects. First, the method chosen gives more accurate descriptive data than any previously used in the field. Second, the design of the study makes comparisons between drinkers and non-drinkers in their everyday life possible and permits insight into the features of abstinence and recovery after drinking cessation. Finally, somehow in an apparent conflict with the overall prevailing intention in science of collecting bias-free data, would it be possible to canalize the unavoidable influence from the experimenter into one experimental factor? Thus, the main hypothesis was that this surveillance along with the method chosen, random action sampling, would be inspiring enough for the drinkers to generate positive results concerning their alcohol misuse.

The experimental group and the control group were recruited via advertisements in daily newspapers. This is a seemingly expensive way to recruit voluntary subjects, and what is worse, could constitute a threat to the validity of the study. The best alternative way would have been to buy a random sample from the population register and approach maybe 1000 persons by letters and telephone calls. This was done in an earlier study of retired people (Sjöberg & Magneberg, 1990), but the distinctive experience from that study was that the procedure was very expensive and time-consuming, in contrast to the relatively small number of persons willing to participate in the study. Trying to motivate people that drink too much to step forward via a letter and a telephone call, would have been even more difficult. It is probably true that people who answer advertisements can be believed to be more extravert than people who do not, but usually people who accept an invitation via letters and telephone calls can also be expected to be more extravert. Therefore, the main concern would be that the drinkers and the non-drinkers were recruited *the same way*. And in perspective, the procedure with advertisements was rather money-saving and very time-saving. It cannot possibly constitute a greater threat to the validity of the study than many other studies have to endure due to their ways of recruiting subjects.

Because of the fairly frequent responses from drinkers and the very frequent responses from non-drinkers, it was possible to match the two groups in many ways, the most important background variables being *age* and *education* (Sjöberg & Magneberg, 1990). An important feature of the study of the control-

subjects to be, was that they were given an identity of their own, not just referred to as 'control subjects'.

The fact that the drinkers participated for 3 weeks with three signals a day and the controls only one week, but with five signals a day, can of course have influenced the results in some way. During the first week of the study, facing the coming reality of being given a chance to control drinking, some drinkers might have become more excited, while others might have become more depressed. The variability of mood would therefore be expected to increase in the group, but not the mean level. The controls, on the other hand, could be expected to change only in the direction of exaltation, being in focus and experiencing themselves as unusually important. In statistical terms this means that the mean differences between the two groups can be expected to increase, making more variables significant. However, the expected increase in variation within the experimental group decreases the strength in the design. The net effect of these two tendencies are important enough, but have not been closely examined in the present study.

Beyond that, the difference in the number of signals per day and the variation in the last page of the questionnaire for the drinkers and the controls is not believed to have influenced the results in any noticeable way. The fact that most questions in the questionnaire focused on everyday life for both groups, makes the differences in the last page unimportant.

The difference in reply frequency was expected. The frequency of the reported actions can, as mentioned before, be considered as a coarse, but nevertheless reliable assessment of the ability to master everyday life. Thus, the drinkers actually had greater difficulties to control their lives than the controls.

The consumption of alcohol was under control during all of the study. The questionnaire was so constructed, that if the subject was only telling the truth, any drinking would be detected. Gratifyingly enough the drinkers really kept their promise not to drink after the first week, with the exception of a few relapses now and then. The whole study would of course have been in vain if that had not been the case.

How people intentionally change addictive behaviors is not well understood, but diligent work in the field has been done by Prochaska and DiClemente, who have developed transtheoretical constructs of stages and processes of change (Prochaska & DiClemente, 1983). According to their research, modification of addictive behavior involves progression though five stages - precontemplation, contemplation, preparation, action, and maintenance - and individuals typically recycle though these stages several times before termination of the addiction.

Precontemplation is defined as the stage at which there is no intention to change behavior in the foreseeable future. Many individuals in this stage are unaware or underaware of their problems. From the viewpoint of the present study this would mean any drinker with no thoughts of quitting. *Contemplation* is the stage in which people are aware that a problem exists and are seriously thinking

about overcoming it, but have not yet made a commitment to take action. From the viewpoint of this study it would mean all those drinkers who reacted when they saw the advertisements in the newspapers. *Preparation* is the stage in which people are intending to take action in a foreseeable future. From the viewpoint of this study it would mean the span of time from the first contact with the project up to Phase I. *Action* is the stage in which individuals modify their behavior, experiences, or environment in order to overcome their problem. From the viewpoint of this study it would mean to undergo phase I in the project. *Maintenance* finally, is the stage in which people work to prevent relapse and consolidate the gains attained during action. From the viewpoint of this study it would mean phase II in the project. In respect to the presented stages above, one can easily find a correspondence between the prevailing theoretical constructs of Prochaska and DiClemente and the way the present study was carried trough.

As shown by Galanter (1993) network therapy can be a powerful factor in rehabilitation programmes. The participants in the present study only met twice, but still most of them reported, during the follow-up interview, the supporting influence they had felt by the fact that they shared their hardships with *others*. But not only that; others under *the same conditions* and *during the same time*. If they felt agony they could say to themselves: "I'm not alone in this misery - I won't give up and let the others down ". This feeling of solidarity was an intended quality in the design of the study.

The purposes of the present study from a scientific point of view were mainly descriptive and explorative rather than theoretical. In these respects the study must be considered successful. An abundance of data has given a rather high-resolution picture of the effect of alcohol misuse on everyday behavior and the effect of drinking cessation. It is also satisfying to know that there was a result of the study in terms of raising life quality among people in a group of alcohol misusers. A similar study has been conducted on nicotine misusers, with equally satisfying results, and is accounted for in a separate report (Magneberg, 1995b). These studies may very well serve as a basis for future studies more aimed at dealing with hypotheses and theoretical constructs relating to health behavior.

In this kind of research it is of the utmost importance that the investigator defines his role very explicitly to the subjects in the study. Overtly recognizing interdependence between the investigator and the subjects, and between the subjects themselves, also seems to be fruitful. The meta-structure of a study is much more than the sum of resources, design and method. It is the dynamic framework within which we want to study parts of reality, and without which we cannot do so successfully.

Summing up, the net results of the study, in terms of controlled drinking were very satisfactory. The psychological profile of the drinker, when drinking and when trying to quit, has an exceptional resolution. In studies of this method of random action sampling is highly recommended.

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APPENDIX A: QUESTIONNAIRE I

INITIALS:
DATE:
DAY:
TIME:
TIME-CODE:

01. What were you doing when the signal arrived?

02. Were you doing anything else at the same time? If so, what?

03. Where were you?

04. How were you feeling when carrying out the action?

not concentrated	1	2	3	4	5	concentrated
insecure	1	2	3	4	5	secure
passive	1	2	3	4	5	active
sad	1	2	3	4	5	happy
indifferent	1	2	3	4	5	interested
tense	1	2	3	4	5	relaxed
uninvolved	1	2	3	4	5	involved
unsociable	1	2	3	4	5	sociable

05. To what extent did you feel

	not at all				*to a great extent*
hesitant	1	2	3	4	5
angry	1	2	3	4	5
contemptuous	1	2	3	4	5
guilty	1	2	3	4	5
disgusted	1	2	3	4	5
surprised	1	2	3	4	5
frightened	1	2	3	4	5
ashamed	1	2	3	4	5

06. Was your mood especially due to past, present or the future?

07. What was the direct cause of your mood?

08. Did you take the initiative to the action?
no, not at all 1 2 3 4 5 yes, completely

09. Were there any other people in your company? If so, how many?

10. What is/was the duration of your action, i.e., the action itself without interruptions?

11. Would you have chosen to do something else, had you had the possibility?
no, certainly not 1 2 3 4 5 yes, absolutely

12. What was the goal of your action?

13. How close (timewise) is/was your action to the goal?

14. How frequent is this action for you?
very infrequent 1 2 3 4 5 very frequent

15. Was your action important?
unimportant 1 2 3 4 5 important

16. What significance did the surrounding situation have for your action?

	hardly at all				*to a great extent*
facilitating	1	2	3	4	5
hindering	1	2	3	4	5
steering	1	2	3	4	5

17. What result do you think your action will have?
negative 1 2 3 4 5 positive

18. How morally justified do you consider your action?
morally unjustified 1 2 3 4 5 morally justified
Alternatively: the question is not relevant ( )

19. How difficult or easy was it to perform your action?
very difficult 1 2 3 4 5 very easy

20. Did your action hinder or facilitate other goals?
hindered 1 2 3 4 5 facilitated

21. Do you think you could influence the situation you were in?
no, not at all 1 2 3 4 5 yes, very much

22. How free were you to leave the situation?
prevented from leaving 1 2 3 4 5 free to leave

23. To what extent do you regret your action?
not at all 1 2 3 4 5 completely

24. Did you like performing the action?
very little 1 2 3 4 5 very much

25. Were you under stress or did you have plenty of time?
very stressed 1 2 3 4 5 plenty of time

26. What was the **main reason** for your action?
Would you characterize this reason as being

	no, not at all				*yes, to a great extent*
a) goal-oriented	1	2	3	4	5
b) value-oriented	1	2	3	4	5
c) situation-oriented	1	2	3	4	5

If any other reason, what?

27. Was there any **deeper reason** for your action?
Would you characterize this reason as being

	no, not at all				*yes, to a great extent*
a) goal-oriented	1	2	3	4	5
b) value-oriented	1	2	3	4	5
c) situation-oriented	1	2	3	4	5

If any other reason, what?

28. Can you think of yet **another deeper reason** for your action?
Would you characterize this reason as being

	no, not at all				*yes, to a great extent*
a) goal-oriented	1	2	3	4	5
b) value-oriented	1	2	3	4	5
c) situation-oriented	1	2	3	4	5

If any other reason, what?

29. Consider your last answer. Can you think of any **final reason** for your action? Would you characterize this reason as being

	no, not at all				*yes, to a great extent*
a) goal-oriented	1	2	3	4	5
b) value-oriented	1	2	3	4	5
c) situation-oriented	1	2	3	4	5

If any other reason, what?

30. If you have any further **comments** on a particular question, specify the number of the question and use the space below.

APPENDIX B: QUESTIONNAIRE II

INITIALS:
DATE:
DAY:
TIME:
TIME-CODE:

01. What were you doing when the signal arrived?

02. Were you doing anything else at the same time? If so, what?

03. Where were you?

04. Were there any other people in your company? If so, how many?

05. What was the goal of your action?

06. What consequences do you think your action will have?

07. What is/was the duration of your action, i.e. the action itself without interruptions?

08. Was your action the result of a well thought-out decision?
not at all ---------- to a great extent

09. How close (timewise) is/was your action to the goal?
very distant ---------- very close

10. To what extent did you feel
hungry ---------- full up
thirsty ---------- not thirsty
sleepy ---------- awake
tired ---------- alert
cold ---------- warm
ill ---------- healthy
tense ---------- relaxed
bodily discomfort ---------- bodily well-being

11. To what extent did you feel

frightened	----------	brave
ashamed	----------	proud
angry	----------	friendly
sad	----------	happy
contemptuous	----------	admiring
nervous	----------	calm
insecure	----------	secure
guilty	----------	praiseworthy
surprised	----------	confirmed expectations

12. To what extent did you feel

not concentrated	----------	concentrated
indifferent	----------	interested
uninvolved	----------	involved
unimaginative	----------	imaginative
devoid of ideas	----------	full of ideas
unplanned	----------	planning

13. To what extent were you

passive	----------	active
inefficient	----------	efficient
uncontrolled	----------	controlled
unskillful	----------	skillful
unsociable	----------	sociable
very stressed	----------	plenty of time

14. How morally justified do you consider your action?

morally unjustified	----------	morally justified

15. Did you take the initiative to the action?

no, not at all	----------	yes, completely

16. Would you have chosen to do something else, had you had the possibility?

no, certainly not	----------	yes, absolutely

17. How frequent is this action for you?

very infrequent	----------	very frequent

18. Was your action important?

unimportant	----------	important

19. What result do you think your action will have?
negative ---------- positive

20. How difficult or easy was it to perform your action?
very difficult ---------- very easy

21. Did your action hinder or facilitate other goals?
hindered ---------- facilitated

22. To what extent do you regret your action?
not at all ---------- completely

23. Did you like performing your action?
very little ---------- very much

24. Did the surrounding situation hinder or facilitate the performance of your action?
hindered ---------- facilitated

25. To what extent did the surrounding situation steer your action or did you steer the surrounding situation?
surroundings steered ---------- surroundings were steered

26. Do you think you could influence the situation you were in?
no, not at all ---------- yes, very much

27. How free were you to leave the situation?
prevented from leaving ---------- not prevented from leaving

28. What was the **main reason** for your action?

To what extent would you characterize this reason as being:
not goal-oriented ---------- goal-oriented
no value of its own ---------- a value of its own
not dependent on situation ---------- dependent on situation

29. Was there any **deeper reason** for your action?

To what extent would you characterize this reason as being:
not goal-oriented ---------- goal-oriented
no value of its own ---------- a value of its own
not dependent on situation ---------- dependent on situation

30. Can you think of yet **another deeper reason** for your action?

To what extent would you characterize this reason as being:

not goal-oriented	----------	goal-oriented
no value of its own	----------	a value of its own
not dependent on situation	----------	dependent on situation

31. Consider your last answer. Can you think of any **final reason** for your action?

To what extent would you characterize this reason as being:

not goal-oriented	----------	goal-oriented
no value of its own	----------	a value of its own
not dependent on situation	----------	dependent on situation

32. When the signal came, did you consume any of the following:

( ) wine, liquor or strong beer
( ) tobacco
( ) food or fruit
( ) candy
( ) coffee or the

33. If you have any kind of comments, please write them here:

APPENDIX B1: LAST PAGE IN SMOKE-QUESTIONNAIRE

33. How many cigarettes have you smoked so far today? ( )

34. Right now, how do you estimate your chances to quit smoking?
very small ( ) ( ) ( ) ( ) ( ) very good

35. How strong is your desire to smoke?
very weak ( ) ( ) ( ) ( ) ( ) very strong

36. How bad is your abstinence?
very light ( ) ( ) ( ) ( ) ( ) very bad

37. How is your relationship with people around you?
very strained ( ) ( ) ( ) ( ) ( ) very relaxed

38. How is your self-appreciation?
bad ( ) ( ) ( ) ( ) ( ) good

39. Since last time you filled in a questionnaire, what have you done to avoid smoking?

40. If you have any kind of comments, please write them here:

APPENDIX B2: LAST PAGE IN DRINK-QUESTIONNAIRE

33. Have you, since the last questionnaire, consumed alcoholic beverage of any kind? Underline appropriate alternative! (yes) (no)

    If yes, what and how much _____

34. Right now, how do you estimate your chances to control your drinking?

    very small ( ) ( ) ( ) ( ) ( ) very good

35. How strong is your desire to drink?

    very weak ( ) ( ) ( ) ( ) ( ) very strong

36. How bad is your abstinence?

    very light ( ) ( ) ( ) ( ) ( ) very bad

37. How is your relationship with people around you?

    very strained ( ) ( ) ( ) ( ) ( ) very relaxed

38. How is your self-appreciation?

    bad ( ) ( ) ( ) ( ) ( ) good

39. Since last time you filled in a questionnaire, what have you done to control drinking?

40. If you have any kind of comments, please write them here:

APPENDIX C1: FOLLOW-UP FORM FOR SMOKERS

NAME:
DATE:

01. How are you feeling physically today compared with prior to the start of the project?
much worse ---------- much better

02. How are you feeling mentally today compared with prior to the start of the project?
much worse ---------- much better

03. How many cigarettes have you smoked during the last week? ( )

04. Is your consumption of cigarettes *ascending* or *descending*, or is it *stabile*? Underline the appropriate word.

05. How strong is your desire to smoke?
very strong ---------- very weak

06. How severe are your abstinence symptoms?
very severe ---------- very easy

07. How is your relationship with people around you?
very strained ---------- very relaxed

08. How is your self-appreciation?
very bad ---------- very god

09. How often do you experience desire to smoke? Underline the appropriate word.
like before - less then before - sometimes - seldom - never

10. What have you done since you last filled in a questionnaire to handle your desire to smoke (if you have any)?

APPENDIX C2: FOLLOW-UP FORM FOR DRINKERS

NAME:
DATE:

01. How are you feeling physically today compared with prior to the start of the project?
much worse ---------- much better

02. How are you feeling mentally today compared with prior to the start of the project?
much worse ---------- much better

03. What and how much alcoholic beverages have you consumed during the last week?

---

04. Is your consumption of alcohol *ascending* or *descending*, or is it *stabile*? Underline the appropriate word.

05. How strong is your desire to drink?
very strong ---------- very weak

06. How severe are your abstinence symptoms?
very severe ---------- very easy

07. How is your relationship with people around you?
very strained ---------- very relaxed

08. How is your self-appreciation?
very bad ---------- very god

09. How often do you experience desire to drink? Underline the appropriate word.
like before - less then before - sometimes - seldom - never

10. What have you done since you last filled in a questionnaire to handle your desire to drink (if you have any)?

APPENDIX D: CODING SCHEDULE FOR STRATEGIES

Category	Examples (I have ...)
Working	- worked more than usual - stayed late at work - skipped coffee-breaks and worked instead
Sleeping	- gone to bed early - slept a lot - taken plenty of naps
Consuming	- eaten / candy / pastry / fruit / - eaten more delicious food - drunk more soft drinks
Emotional	- / sulked / hated / cried / suffered / endured / - been irritated towards / myself / people around me / the cessation-project / - suppressed /desire / abstinence symptoms / - felt / sorry for / proud of / myself - / fought / endured in silence /
Cognitive	- used willpower - tried to think / of something else / as little as possible on smoking-drinking / on what I save / on what to spent the money on / on what people around me will say if I succeed or fail / I'm not alone in this / - inspired myself / not to smoke-drink / that things will be all right / to abstain / - tried to / resist / forget about smoking-drinking / struggle / keep my decision
Talking	- / told / complained to /other people - / talked / played with talk /
Avoiding	- avoided / smoking-drinking places / smokers-drinkers / - declined / parties / dinner at restaurants / - tried / not to bye cigarettes-alcohol / to postpone the next cigarette-drink / - left the room if someone has started to smoke-drink - given priority to / non-smokers-drinkers / non-smoking-drinking environments / other activities than smoking-drinking / - stayed in my working-room

Active	- been / active / doing many things / running around / wandering about / occupied / - been / walking / shopping / driving / studying / knitting / painting / sewing / cocking / baking / making pastry and candy / reading / socializing / saving money / dancing / exercising a hobby /
Body-caring	- been to the hairdresser - been / bathing / manicuring / sauna-bathing / - been / relaxing / taking deep breaths /

SUBJECT INDEX