Tracing Selection Effects in Three Non-Probability Samples

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Key Words
Illegal drug use · Hidden populations · Snowball sampling

Abstract
Snowball sampling and targeted sampling are widely applied techniques to recruit samples from hidden populations, such as problematic drug users. The disadvantage is that they yield non-probability samples which cannot be generalised to the population. Despite thorough preparatory mapping procedures, selection effects continue to occur. This paper proposes an interpretation frame that allows estimating the direction of selection bias after data collection. Critical examination of the recruitment procedure and comparison with statistical and non-statistical external data sources are the core features of the interpretation frame. Applying the interpretation frame increases insight into the reliability of the results and allows to estimate where selection bias may have occurred.

Background
In the field of drug research, probability samples of populations consuming illegal drugs in a given geographical area are not easily obtained since no known sampling frame exists and membership of such a group is potentially risky [1]. Such populations are usually referred to as hidden populations. Hidden also implies that the behaviour under investigation is a low-incidence phenomenon and a general population survey would not yield enough cases to allow inferences to be made. Established recruitment methods within hidden populations are snowball sampling [2–4] and targeted sampling [5, 6]. The snowball sampling technique is known for its ability to explore new but little understood phenomena and for its selection bias towards the most co-operative subjects [7]. The targeted sampling method was designed to avoid the selection bias arising in samples from institutional settings [5]; however, the method tends to over-represent the most problematic and visible subjects [1]. In probability sampling, the sampling frame and the mathematical laws of change serve as reference points whereas a hidden population omits such reference points. This paper aims to present an example of identifying the direction of selection bias in three non-probability samples of problematic drug users. Whereas in probability sampling the sampling frame is the most important prerequisite for accurate sampling, for non-probability sampling procedures we present an ‘interpretation frame’ to be applied after the data have been collected. From the experience gained with several recruitment procedures and interpretation of the subsequent results, we constructed an interpretation frame which helps to identify selection effects in surveys conducted. The interpretation frame enhances insight into the reliability of the results and allows to estimate where selection bias may have occurred.
surveys in 1998, 2000 and 2003 using both these methods. For these surveys we describe the application of the interpretation frame on key demographic variables and on the variable homelessness.

**Snowball Sampling and Its Selection Problems**

Data produced by the snowball sampling technique are often referred to as 'chain data' [1, 7]. Chain data may be used to make inferences about chains and chaining processes, and may also be used to make inferences about networks. Inferences from chain data may be used to make statements about individuals, or in aggregated form about groups. The general principle is simple: a subject is asked to name person(s) in his or her network and this next person is also asked to give names, and so on. The initial sample is preferably a randomly drawn one, but in practice this is difficult to achieve and is likely to bias towards the most co-operative subjects. Theoretical notions about selection bias in snowball sampling, such as 'social distance' and 'reflexive bias', lead to practical implications regarding its execution; the rigour of design but in practice this is difficult to achieve and is likely to depend on the purpose of the study [7, 8].

First, in studies of an explorative nature generalizability and variance (variation) are of less concern. Second, if the main purpose of the study is to provide 'within-group' and 'between-group' descriptions in quantitative terms – in the sense of generating more accurately 'grounded' hypotheses about the population and initial (tentative) testing of (these) hypothesis – snowball sampling should be subjected to more rigorous procedures. Third, if researchers want to make a statistical inference from sample to population, the highest possible degree of rigour is needed [7]. The degree of rigour refers to both the preparation of the sampling procedure and the nomination procedure. The sampling procedure should be preceded by a tentative map, based on existing knowledge, indicating the distribution of the phenomenon under study over place and time.

It is recommended to make the initial sample as large as possible to overcome initial selection effects, particularly when inferences will be made from sample to population. The type of nomination procedure also depends on the goal of the study. If the study focuses on analysing the network structure, it might be advisable to recruit the nominated ‘best friends’. If the snowball sampling procedure is used to meet the requirements of a probability sample, it might be better to select a fixed proportion of the nominees at random, or to select them from the list of respondent’s nominees in reverse order of importance.

The respondent-driven sampling method is a variant of snowball sampling that claims to overcome sampling bias by introducing a double incentive system for recruiting respondents. Respondents are not only compensated for their co-operation but also financially rewarded if they bring nominees to the research team [1]. The disadvantage of this method is the time it takes to recruit the number of respondents necessary to steer away from selection bias. This feature can lead to respondent identification problems (impersonation), which can only be countered by additional eligibility control procedures [9].

**Targeted Sampling and Its Selection Problems**

The targeted sampling method, as described by Watters and Biernacki [5], was developed to overcome the selection bias produced by recruiting respondents from institutional settings, such as treatment programmes, clinics or police stations. The development of an ethnographic map is a key element of this technique. triangulation of various data sources (ethnographic fieldwork, treatment data, police data) helps to develop an ethnographic map which contains knowledge of drug user concentrations in a given area. Watters and Biernacki [5] recognise three sources of bias: time, location and recruitment strategy. Recruiting respondents during office hours causes a bias towards the unemployed. Location bias may occur if the interview premises are geographically or culturally difficult to access. Recruitment strategies within the targeted sampling method may include payment of respondents, which can lead to bias towards drug users needing cash. Heckathorn [1] underlines the time and location bias by pointing out that much of the retail drug traffic takes place in private apartments and other non-public settings. These limitations have been reported by others applying targeted sampling techniques [6, 10]. Thus, selection bias in targeted sampling, despite extensive preparatory work, is most likely to yield a sampling with over-representation of the most visible and problematic drug users.

**Interpretation Frame**

Most methodological descriptions only report on preparatory work, but to control for selection bias in the samples a systematic interpretation also has to be performed after the data have been collected. Empirical data are not self-evident and need the interpretation of the researcher to attach significance to them. Interpretation of data involves comparison with existing knowledge and
assumptions; this also applies to interpreting the distribution of demographic key variables such as age, gender and ethnicity. These latter variables are the respondents’ attributes that remain the same, even if social conditions change drastically. In addition to preparatory mapping procedures, validation with external data sources can be performed after data have been collected. Or, if samples were previously drawn from the same target group [6], the key demographic variables can be compared with that data set. If more data sets are available, as is the case in Rotterdam, the best-controlled data set should be taken as reference sample. In addition, the assumption should be made that the demographic composition of the target group has remained more or less the same over time. This assumption helps to detect changes in the composition of target group over time. If no statistical sources are available, the results should be compared with other (qualitative) data. In addition, a description and critical examination of the actual recruitment procedure may help to estimate time, location and recruitment strategy bias. In short, critical examination of sampling procedure(s), validation with external data sources, using the best-controlled data set as reference survey and the assumption that the target group has *grosso modo* remained stable may serve as a frame for interpreting survey data.

**Research Context**

Since 1995 the Rotterdam DMS describes trends and phenomena in the group of (almost) daily users of heroin, cocaine and other drugs in the city of Rotterdam. The number of problematic hard-drug users in Rotterdam (590,000 inhabitants) is estimated between 3,500 and 4,500 individuals [11, 12]. DMS collects data by means of weekly ethnographic fieldwork carried out by staff members of the research team and freelance community fieldworkers, who submit written reports based on their daily life [13]. Another source of data is interviews with key persons in or at the margins of the drug scene. A third DMS data source is a regularly repeated survey among drug users. Targeted sampling and snowball sampling methods were applied in three DMS surveys among the target group; these surveys were conducted in 1998, 2000 and 2003. The aim of the survey is to get an ‘image’ of the lives of drug users with respect to basic demographics, drug use (e.g. preferred drugs, frequency of use, mode of administration), buying drugs (type of dealers, prices), housing situation, income and debts and other points. There are two principal reasons why the DMS surveys strive for representativeness. First, DMS wants to make statements that can be generalised to the entire target group. Second, it is in the nature of a monitoring system to make inferences about changes within a given time period. If subsequent survey results change, we want to be sure that these changes reflect genuine changes in the drug scene. The most appropriate way to measure empirical changes is to apply the same design for each survey. However, the three DMS surveys demonstrate that it is not always possible to duplicate a design from one year to another. Circumstances within the drug scene change and adaptation of the recruitment strategy is necessary.

**Three Surveys: An Overview**

The three surveys used as an example here are comparable in the sense that they purport to cover the entire city of Rotterdam and aim at producing an up-to-date image of the drug scene. Table 1 gives an overview of the data collection procedures used. Each survey period lasted between 5 and 8 weeks, during which time drug users were interviewed using a structured questionnaire. Given the

<table>
<thead>
<tr>
<th>Type of recruitment</th>
<th>1998</th>
<th>2000</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completing the questionnaires</td>
<td>individual community field workers and DMS researchers</td>
<td>individual community field workers and DMS researchers</td>
<td>team of DMS researchers and interviewers</td>
</tr>
<tr>
<td>Responders</td>
<td>203</td>
<td>204</td>
<td>201</td>
</tr>
<tr>
<td>No response</td>
<td>15%</td>
<td>23%</td>
<td>28%</td>
</tr>
</tbody>
</table>

Table 1. Data collection methods in the DMS surveys of 1998, 2000 and 2003
available resources and based on previous experience
with the recruitment process, approximately 200 drug us-
users were interviewed for each survey. In each survey the
research team deployed drug users (so-called community
fieldworkers) to assist with the data collection: in 1998 as
interviewers, in 2000 as interviewers and recruiters, and
in 2003 as recruiters only. Prior to each survey, interview-
ers and recruiters received training concerning the ques-

tionnaire, interview techniques, and random recruitment
tactics. In each survey year we drew an ethnographic map
based on the knowledge generated by the community
fieldwork. The recruitment targets described in the eth-
nographic map reveal information about estimated drug
user density in identified areas. The ethnographic map
only roughly stratifies according to ethnic background
and gender, e.g. based on the estimated number of female
drug users working in the prostitution zone. Within the
identified targets the interviewers recruit respondents at
random to avoid additional bias as much as possible.

The 1998 Survey
Application of the targeted sampling method in 1998
builds upon extensive ethnographic field work. On the left
bank of the river Maas, cutting the city in two halves, 1
female community fieldworker is employed 32 h/week.
On the right river bank, 3 freelance community fieldwork-
ers report their observations each week. The information
generated by the community fieldworkers is combined
with the knowledge of the research team about drug den-
sity in several neighbourhoods. Based on this ethnograph-
ic knowledge, a rough ethnographic map is drawn up,
dividing the city in three areas. In this 1998 edition of
the survey, the interviews were conducted by 7 interviewers,
of which 5 were community fieldworkers. With the aid of
the community fieldworkers, the ethnographic map is di-
vided into sub-areas and distributed among the inter-
viewers.

The 2000 Survey
Compared with 1998, the most important change in
the drug scene is the decreased importance of dealing ad-
dresses in favour of ‘the street’ as a recruitment site. We
have described such changes in the retail market in previ-
ous DMS studies [14, 15]. On the right bank of the river,
4 community fieldworkers interviewed 140 drug users,
who were recruited by means of the targeted sampling
method. On the left bank of the river we recruited by
means of snowball sampling. The main reason for the
shift to snowball sampling was that we felt there was ins-
sufficient knowledge to construct an ethnographic map in
that part of the city. Notably, on the left bank of the river
it appeared that, as a result of joint municipal and police
efforts, dealing addresses were being replaced by street
dealing and, more importantly, by mobile phone dealing
(table 2). A feature of mobile phone dealing on the left
bank was that deliveries were made at people’s homes. In
terms of targeted sampling the targets had become indi-

gualised: more dispersed and less identifiable.

The initial sample for the snowball procedure was
compiled as follows. A freelance community fieldworker
(female, Dutch, aged 37 years, living with partner, heroin
user and on methadone substitution, prostitution) listed
20 people in her neighbourhood she identified as being
drug users, most of them she knew by name and some by
face only. A second person (male, Dutch, aged 44, heroin
user and on methadone substitution, visitor to a drop-in
centre) was recruited whilst he was waiting at a work proj-

tect; he listed 52 drug users he said he had seen in the pre-

vious month. The two lists were compared and two indi-
viduals who appeared on both lists were removed from
the man’s list. Five people from the woman’s list and 10
from the man’s list were randomly selected. This ‘short
list’ of 15 people was designated as zero stage. The initial
male and female were hired and trained as interviewers.
Before the actual interview started all respondents went
through the nomination procedure, which met the re-

quirements for probability sampling. Including the 15
zero stagers, 222 persons were nominated, 104 nominees
were selected and finally 63 of them were interviewed.

The 2003 Survey
In 2003 the ethnographic fieldwork served as a reliable
basis to map recruitment sites throughout the city. Due
to changes in the retail drug market (see below), we ad-

ded two drop-in centres to the ethnographic map. The

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Table 2. Percentage of respondents recruited at ‘type of site’ in

<table>
<thead>
<tr>
<th></th>
<th>1998 (n = 204)</th>
<th>2000 (n = 138)</th>
<th>2003 (n = 201)</th>
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</thead>
<tbody>
<tr>
<td>Dealing address</td>
<td>47</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>Street</td>
<td>28</td>
<td>52</td>
<td>71</td>
</tr>
<tr>
<td>Other</td>
<td>26</td>
<td>31</td>
<td>24</td>
</tr>
<tr>
<td>Total</td>
<td>101</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

1 Targeted sampling only.
2 Inference made from variable ‘location of interview’.
3 >100 due to rounding.
map was adapted and validated by discussing the drug user density in various neighbourhoods with two teams of outreach workers. The interview team comprised 5 professionals (researchers and research assistants) and 1 community fieldworker, with proven skills in other projects. The choice to work mainly with professionals was motivated by the changed circumstances in the Rotterdam drug scene. Dealing addresses were reduced to a minimum and the relative advantage for community fieldworkers to have privileged access had therefore diminished (table 2). Nevertheless, we deployed drug users as guides at several sites which were relatively unknown to the interviewers. Of 201 respondents, 109 were recruited with the assistance of a guide. Due to this procedure most of the respondents were recruited at street locations as opposed to locations behind doors.

**Applying the Interpretation Frame to Some Variables**

The goal of the surveys was to picture the situation of the target group. The sampling procedures described above reflected that the shape of the retail market had changed significantly. Examining the sampling procedures we conclude that the 2003 survey was controlled best by the research team. The ethnographic map was validated by comparing community fieldwork knowledge with knowledge gained from outreach workers. As researchers we conducted the majority of the interviews ourselves. Although this may not affect the reliability, the researchers had better control over the procedure.

**Demographic Variables**

Table 3 shows that in 2003 fewer women were interviewed, but the difference is not significant ($\chi^2 p > 0.05$). Analysis of variance shows that the mean age in the survey years differs significantly, with the mean ages of 1998 and 2000 being significantly lower than in 2003 (one-way ANOVA: $F_{5,5} = 0.004$; t test: $p < 0.05$). Looking at the distribution of white Dutch in the three surveys it is noteworthy that the proportion in 2003 is 15% smaller than in 2000, and 10% smaller than in 1998; these differences are significant ($\chi^2 p < 0.01$). Assuming that *grosso modo* the target group has remained the same with respect to gender, age and cultural background, the differences in demographic variables in table 3 may be explained through selection effects.

For validation purposes, a suitable external data source could be registration data from methadone maintenance programmes (MMPs), i.e. the distribution of key variables could be compared with the DMS survey data. The most recent MMP data are available for the year 1997 and the following data figures are computed based on the total number of MMP participants ($n = 1,973$) in that year: i.e. 26% of the drug users in MMP were female and the mean age was 36.4 years. Cultural background is not registered in the MMP but country of birth, 60% of the participants were born in the Netherlands [16]. Comparing data from a street sample, such as the DMS surveys, with MMP data has some limitations. First, a methadone programme necessarily includes opiate-dependent persons, whereas the survey also includes ‘pure’ cocaine users. Second, 55% of the respondents in the 2003 DMS sample were also in methadone treatment, thus the comparison is only partly valid.

Comparing the distribution of gender in the DMS surveys with that of the MMP shows that the DMS data of 1998, 2000 and 2003 all deviate to the same extent. The distribution of gender remains within the boundaries of the confidence interval and no additional explanation is necessary. Although we are not dealing with a cohort, based on the literature we expect that the mean age will increase in more or less regular steps over time [16, 17]. Therefore a mean age of 36.4 years in the MMP fits this expectation. The outlier in the 2003 sample is the presence of white Dutch, 47% is lower than in both the previous DMS samples and the data from the MMP registration. In the DMS data set of 2003 the Surinamese and Antillians represent 30% of the sample (data not shown). Whereas in the MMP population they represent a stable 15% [16], their increased presence in the 2003 DMS sample is noteworthy. Looking back at the recruitment procedures, the impression emerges that the 2003 data are biased by the fact that most of the participants were recruited from street locations, whereas in 1998 and 2000 the majority was recruited at private locations (table 2).

<table>
<thead>
<tr>
<th></th>
<th>1998</th>
<th>2000</th>
<th>2003</th>
<th>Significant¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female, %</td>
<td>30</td>
<td>30</td>
<td>22</td>
<td>NS</td>
</tr>
<tr>
<td>Mean age, years</td>
<td>36.8</td>
<td>36.9</td>
<td>38.9</td>
<td>S</td>
</tr>
<tr>
<td>White Dutch, %</td>
<td>59</td>
<td>62</td>
<td>47</td>
<td>S</td>
</tr>
<tr>
<td>Homelessness, %</td>
<td>22</td>
<td>28</td>
<td>40</td>
<td>S</td>
</tr>
</tbody>
</table>

¹ Year of reference is 2003.
This leads to the hypothesis that white Dutch drug users are more ‘hidden’ in private locations that non-white Dutch. This is in concordance with the ethnographic notion that non-white Dutch tend to be in the streets more than white Dutch drug users. On the other hand, non-white Dutch in Rotterdam increased to 46% in 2002 [18], and this is also reflected in the drug scene. We estimate that both suppositions are true: the small proportion of white Dutch in 2003 is due to selection effects and also reflects an actual increase in non-white Dutch in the Rotterdam drug scene. Examination of the snowball procedure in 2000 reveals that the basic requirement of a large zero stage sample was not met, i.e. there were only 2 and not 15 persons. However, the distribution of key demographic variables in 2000 is in line with expectations derived from examination of the data set of 2003 and the data from the MMP registration. Apparently, the small zero stage did not cause any measurable selection effects.

Secondary Variable: Homelessness

Bias in key demographic variables may lead to bias in other relevant attributes of the sample under study. The key variables examined are the subjects’ attributes that do not change. Other attributes, such as housing situation, drug use and sources of income can change over the years; for the purpose of this paper we call them secondary variables. As an example we will interpret the bias in the data on homelessness.

Table 4 shows that homelessness is steadily increasing ($\chi^2 p < 0.005$) in Rotterdam, but we cannot conclude that it has almost doubled in 5 years. An estimate of homelessness in Rotterdam in 2001 may serve as an external source of validation [19]. Based on the number of individuals in various night shelters and an estimation of non-institutionalised homeless people, the researchers calculated a total of 4,607 homeless individuals in 2001. This number is based on the extended definition of homelessness, which includes day shelter visitors who are not necessarily homeless in the strict sense. The researchers estimate that one third (almost) daily uses drugs, amounting to about 1,500 homeless drug users. The 2000 DMS survey found 28% of the sample to be homeless. With an estimated population of 3,500–4,500 problematic hard drug users, this amounts to about 980 and 1,260 of the estimated population of problematic drug users [11, 12]. Taking the different definitions into account we see that the figures are similar. Additionally, we turned to ‘the field’ to check the assumed increase. Professionals running night shelters in the city confirm that there is an increase in the number of homeless drug users since 1998, but precise figures are lacking. Another external indication of increased homelessness is the implementation of facilities for homeless persons. Since 1998 night shelter capacities have increased by approximately 45% and day shelter capacities have doubled [C. van Gerven, pers. commun.]. Assuming that homeless drug users are more likely to buy from street dealers, it could be hypothesised that the increased recruitment from street locations in 2003 resulted in an increase of homeless drug users in the sample. To examine this we have related ‘housing situation’ with the variable ‘buying from street dealers’. In doing so, we observe that from 1998 to 2003 buying from street dealers increased by 10%. This holds for both the homeless and the housed persons. Thus the possibility of recruitment of both groups has increased equally. However, one could argue that homeless drug users might buy from street dealers more often and consequently have a greater chance to be sampled by our guides and interviewers. In 1998 homeless drug users bought significantly more often from street dealers than drug users with housing, i.e. 8 days more in the previous month. In 2003 this difference had reduced to the non-significant difference of 4 days in the previous month. In brief, although homeless drug users buy more often from street dealers than drug users with housing, the differences are too small to account for an increased share of homeless people in our sample due to the recruitment strategy. Moreover, if this variable influences the chance to be sampled this might have caused an overestimation of homeless people in 1998 rather than in 2003. In short, after controlling for possible selection effects we can conclude that homelessness among drug users has indeed approximately doubled between 1998 and 2003.
Conclusions

Targeted sampling and snowball sampling techniques are methods that are applied when a known sampling frame is lacking, prevalence in the general population is low and the behaviour under study is stigmatised. Given these conditions it is plausible, justifiable and advisable to employ these techniques. A major disadvantage of these techniques is that they produce non-probability samples. Although the techniques can be refined by introducing stratification and randomisation strategies, they do not become probability samples. No unconditioned inferences can be made from sample to population.

Within the context of a monitoring system, successive surveys are preferably conducted in the same manner. If this condition is not met an important precondition for comparability is, strictly speaking, ruled out. However, changing circumstances may force the research team to modify sampling strategies. This paper is an exercise in trying to unravel selection biases and re-examine some results. As a known sampling frame is unavailable, we have tried to explain deviating or unexpected results by applying an interpretation frame. The interpretation preferably consists of external (statistical) data and critical examination of the sampling procedures applied. In addition, the sample which is considered to be best-controlled is appointed as the reference. Finally, assumptions are made about demographic changes in the population under study. The three samples described in this paper are all non-probability samples and we do not know to what extent they reflect the entire population of (daily) users of heroin and/or cocaine. From mutual comparison (qualitative and statistical) we conclude that no selection effects occurred for age and gender, but did for ethnicity. Although this may be selection bias, the gradual change towards fewer white Dutch drug users is in accordance with the demographic development in the general Rotterdam population. The increase in mean age is primarily a result of little influx of young drug users.

The secondary variable we explored was homelessness. The successive surveys show a steady increase in homelessness and examination of these data with the interpretation frame confirms the increase found in 2003 as a real increase. To conclude, targeted and snowball sampling techniques do not yield probability samples and the exercise we conducted does not change that. However, we have created a frame of interpretation which helps to estimate the significance of the results. The results of application of the interpretation frame are summarised in table 4, which shows some empirical results from the three surveys. The outcomes of the interpretation exercise are reported as ‘biased’ or ‘real’.

The first lesson to be learnt from the above-described exercise is that good research starts with good research design. In survey research, mistakes in the design and its execution have severe repercussions and cannot be corrected afterwards. On the other hand, all non-probability samples face some selection bias, which has to be considered. The purpose of the surveys in this example case is to picture the state of the drug scene in Rotterdam. The central issue here is representativeness; any presence of ‘selective forces’ excludes the claim of representativeness [20]. The distribution of demographic characteristics and attributes in the samples cannot be extrapolated to the study population because we do not empirically know what our study population is. The more precise the definition of the target group, the clearer the picture becomes. A definition such as ‘opiate users in Rotterdam’ or ‘heroin and cocaine users in Rotterdam’ leaves the boundaries open. In tracing selection effects, inclusion of a reference for the frequency of drug use (almost) daily in the definition of the target group enhances the preciseness of the findings. In the recruitment phase, however, the operational definition should be open. Taking into account that the DMS survey is part of a monitoring system, it must be sensitive to changes occurring at street level. Complex and difficult-to-control eligibility criteria should preferably be avoided in street situations. The examination of the results leads to insight into the ‘harvest’ and only then can we make statements about the characteristics of the sample captured.
References


Call for Nominations

The 2006 Jellinek Memorial Fund Award for Outstanding Contributions to the Advancement of Knowledge on Alcohol/Alcoholism

Nominations are solicited for the 2006 Jellinek Memorial Fund Award to a scientist who has made an outstanding contribution to the advancement of knowledge in the alcohol/alcoholism field. Nominated candidates may come from any country. The category for the Year 2006 award, specified by the Board of Directors of the Jellinek Memorial Fund, will be Behavioral (Clinical and Experimental) Studies. Nominees must have contributed outstanding research in this specific (albeit broad) area, and should be someone who would provide an example and serve as a model for others who might be attracted to work in this field. In addition to a cash award of CDN 5,000, the recipient is presented with a bust of the late E.M. Jellinek with an appropriate inscription. The Jellinek Memorial Fund Award is traditionally presented at a major international conference, and if necessary, travel and accommodation expenses are provided to permit the awardee to attend the conference for presentation of the award. To complete the nomination of a candidate, submit four copies of the following materials: (1) a detailed letter describing the principal contribution(s) for which the candidate is being nominated, signed by the nominator and any co-nominators, and (2) a current copy of the candidate’s curriculum vita.

Nominations must be received no later than November 1, 2005, and should be sent to the Chair of the Selection Committee:

Dr. Richard Fuller
20 Paddock Ct.
Potomac, MD 20854, USA