

1 The Experiment Design and Sample Selection

Towards the end of 60s and in 70s, there was a heightened interest in assessing the impact of a guaranteed annual income (GAI) or a negative income tax (NIT) in the United States and in Canada. The high levels of poverty motivated the debates on these policies. In 1968, Economic Council of Canada had declared that poverty among Canadians was widespread beyond belief (Hum and Simpson 1991) Much of the debate concentrated on the effect of such programs on the labor market and on the work incentives of such an income transfer.

These policy discussions and concerns over work behaviour motivated experimental research in both countries. In the United States, the first such experiment was conducted in New Jersey and was followed by similar programs in Seattle, Washington; Denver, Colorado and Gary, Indiana. In Canada, a negative income tax program was launched in 1974 in Manitoba to be continued until 1974 with the main purpose of estimating the labor supply effects of this program. These data are unique in the sense that they were the first and last such randomized controlled trials conducted in an industrialized country.

The provincial government of Manitoba in Canada submitted a proposal on the project mainly with the intention to understand the effect of a GAI on labor supply as well as the feasibility of this transfer scheme (Farthing 1992). The Manitoba Basic Annual Income Experiment (Mincome) was conducted in this context between 1974 and 1979 under the joint sponsorship of the Manitoba government and the federal government of Canada. The experiment was launched on three sites: the urban dispersed site in the provincial capital city Winnipeg, a rural dispersed sample and a saturation site in Dauphin. The dispersed samples composed of randomly selected families in Winnipeg and rural areas whereas in Dauphin, the whole population was eligible to receive the payments.

The design of the treatment groups was based on a combination of three different levels of guaranteed income payments and three tax levels. The annual support level represented what the household would receive if they had no other source of income or wealth. This mount was calculated for a four-person household and was then adapted for other households. Increases in family income and/or net worth would reduce this payment. The assigned tax rate determined at which rate the income support declined with this increase. Depending on the tax rate and support level the household was assigned to, the final payment was given by $P = G - tY - rW$ where G is the support level, t the offset tax rate and r the tax rate on wealth, which was fixed for all groups. (Hum, Laub and Powell, 2016: 1). The overview of different treatment groups, or plans can be seen in the following table:

Table 1: Treatment Plans

GAI Level Tax Level	\$3800	\$4800	\$5480
%35	Plan 1	Plan 2	X
%50	Plan 3	Plan 4	Plan 5
%75	Plan 6	Plan 7	Plan 8

The most generous plan with the highest support level and lowest tax rate was eliminated from the start on the grounds that it was too generous for it to be ever implemented, and was thus of no political relevance. The least generous plan, Plan 6, was merged with Plan 7 after a while due to the high rate of dropping out (User Manual).

A few words should be said on the sample selection. Ideally, both the selection of the sample and the allocation to treatment and control groups should be completely random, with each group composed of more or less the same number of units.

The sample selection for Mincome consisted of several steps. In the first step, a large sample of 24,000 households was randomly chosen from the population of Winnipeg and the rural sites. As the policy targeted low-income families, these households were then interviewed and screened for eligibility. In Dauphin, the whole population was eligible. A total of 3,800 families were considered eligible out of which 1,671 enrolled in the program. While the treated households in the rural areas and in Dauphin were all assigned to Plan 3, there were-initially-eight treatment and one control group for the urban site in Winnipeg.

In Winnipeg, the allocation to different treatment groups was realized using the Conlisk-Watts model, following the example of similar NIT experiments in the United States. The reason was that, in the context of a policy experiment with limited budget, several trade-offs were considered. First of all, the cost of assigning a household to a specific treatment group depended on the family size and income, meaning that some units were more expensive than the others. Minimizing this cost per unit allows to have a larger sample size. The second trade-off came stemmed from the heterogeneity of treatment plans in terms of their policy relevance. The policy makers had an interest in having more reliable samples for the more important treatment plans. The trade-off between randomization and cost and policy considerations was tackled with the Conlisk-Watts assignment model that optimizes the experimental design given certain constraints. The sample was stratified using two variables: family structure and income. The family structure was stratified along four states: double-headed families with multiple earners, double-headed families with a single earner, single-headed families and single-headed individuals (Hum et al., 2016). This is of particular importance for this study that looks at the fertility decisions as it implies that the

assignment to treatment cells, partially determined by family structure, is not orthogonal to the outcome variable. It is therefore important to employ a multivariate analysis where the stratifying variables are included in the regression (Keeley and Robins, 1980).

A further concern for the sample selection is non-participation and attrition. If we can assume that refusing to participate and dropping out of the program is random, this does not pose any problem other than for the sample size. If however, households with certain characteristics are more prone to refuse to participate in the interviews or to drop out of the program, we would have a bias in the sample. The participation in such an experiment is associated with certain costs, not least in terms of time. Mincome experiment required the participants to participate in periodic interviews every three months and to file monthly reports of income. The interviews were composed of a very extensive set of questions that went beyond labor supply and included socio-psychological variables, leisure time use, satisfaction with marital life and so on. It is plausible to think that families for whom the benefits are less important will have less incentive to go through the interview and filing processes.

In our case, a family planning on having a child might find it more important to receive the benefits and thus be less likely to drop out of the program. This would create the problem of self-selection into the sample and overestimate the effect of the program on fertility.

Table 2: Summary descriptives table by groups of ‘Participated’

	0 N=1421	1 N=752	p.overall
Double-Headed Household:			0.359
0	622 (43.8%)	313 (41.6%)	
1	799 (56.2%)	439 (58.4%)	
Single-Headed Household:			0.865
0	1164 (81.9%)	613 (81.5%)	
1	257 (18.1%)	139 (18.5%)	
Single Individual	0.26 (0.44)	0.23 (0.42)	0.186
Age of Female Head	34.7 (12.5)	34.0 (12.2)	0.202
Age of the Male Head	36.7 (13.0)	36.1 (11.9)	0.436
Number of Children in the Household:			0.001
0	937 (65.9%)	434 (57.7%)	
1	320 (22.5%)	196 (26.1%)	
2	134 (9.43%)	96 (12.8%)	

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	0 N=1421	1 N=752	p.overall
3	25 (1.76%)	23 (3.06%)	
4	3 (0.21%)	3 (0.40%)	
5	2 (0.14%)	0 (0.00%)	
Homeowner Dummy:			0.470
0	887 (62.4%)	482 (64.1%)	
1	534 (37.6%)	270 (35.9%)	
Assigned Treatment Group:			<0.001
Not enrolled from the start	516 (36.3%)	4 (0.53%)	
1	32 (2.25%)	54 (7.18%)	
2	20 (1.41%)	66 (8.78%)	
3	370 (26.0%)	270 (35.9%)	
4	35 (2.46%)	70 (9.31%)	
5	24 (1.69%)	55 (7.31%)	
6	36 (2.53%)	49 (6.52%)	
7	29 (2.04%)	27 (3.59%)	
8	26 (1.83%)	44 (5.85%)	
Control	333 (23.4%)	113 (15.0%)	
Liquid Assets	1895 (5539)	1790 (4964)	0.665
Debt	1336 (2348)	1281 (2045)	0.574
Labor Participation (Male Head)	0.71 (0.45)	0.83 (0.37)	<0.001
Reason why male head did not look for work:			.
Employed	780 (79.7%)	426 (84.5%)	
Laid off	4 (0.41%)	0 (0.00%)	
Labor dispute	0 (0.00%)	1 (0.20%)	
Unpaid vacation	5 (0.51%)	4 (0.79%)	
No jobs available	7 (0.72%)	1 (0.20%)	
Bad weather	2 (0.20%)	0 (0.00%)	
Wanted to take care of family	2 (0.20%)	3 (0.60%)	
Child care too expensive	0 (0.00%)	1 (0.20%)	
In-job training	3 (0.31%)	1 (0.20%)	
In school	19 (1.94%)	12 (2.38%)	

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	0 N=1421	1 N=752	p.overall
Available wages too low	3 (0.31%)	2 (0.40%)	
Did not want to work	91 (9.30%)	34 (6.75%)	
Ill or disabled	50 (5.11%)	14 (2.78%)	
Self-employed	3 (0.31%)	2 (0.40%)	
Retired	2 (0.20%)	1 (0.20%)	
Has a job but has not started working	8 (0.82%)	2 (0.40%)	
Number of Hours Worked Past Week (Male Head)	334 (178)	365 (147)	<0.001
Job Satisfaction Index (Male Head):			<0.001
0	268 (27.5%)	80 (16.0%)	
Very satisfied	220 (22.5%)	137 (27.3%)	
Somewhat satisfied	346 (35.5%)	197 (39.3%)	
Neither nor	73 (7.48%)	30 (5.99%)	
Somewhat unsatisfied	47 (4.82%)	37 (7.39%)	
Very dissatisfied	22 (2.25%)	20 (3.99%)	
Expected or actual childcare cost (Male head)	0.59 (5.08)	0.31 (3.10)	0.187
Number of Jobs Worked in 1974 (Male Head)	0.91 (0.74)	1.06 (0.70)	<0.001
Total Earnings in 1974 (Male Head)	4725 (3637)	4977 (3300)	0.191
Total Earnings in 1973 (Male Head)	3928 (3356)	4511 (2986)	0.001
Number of Weeks Employed in 1974 (Male Head)	28.6 (24.1)	33.0 (22.8)	0.001
Number of Weeks Employed in 1973 (Male Head)	30.4 (21.9)	34.9 (19.4)	<0.001
Years of Schooling Completed (Male Head)	8.28 (4.79)	9.44 (4.28)	<0.001
Completed high school (Male head):			<0.001
0	153 (15.6%)	35 (6.94%)	
1	82 (8.38%)	51 (10.1%)	
2	744 (76.0%)	418 (82.9%)	
Labor Participation (Female Head):			0.036
.	3 (0.24%)	2 (0.29%)	
0	688 (55.5%)	420 (61.1%)	
1	549 (44.3%)	265 (38.6%)	
Job Satisfaction Index (Female Head):			.
.	3 (0.24%)	2 (0.29%)	

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	0 N=1421	1 N=752	p.overall
0	608 (49.2%)	386 (56.4%)	
Very satisfied	203 (16.4%)	106 (15.5%)	
Somewhat satisfied	285 (23.1%)	127 (18.6%)	
Neither nor	66 (5.34%)	18 (2.63%)	
Somewhat dissatisfied	49 (3.97%)	31 (4.53%)	
Very dissatisfied	21 (1.70%)	14 (2.05%)	
Completed high school (Female head):			0.080
.	3 (0.24%)	2 (0.29%)	
0	76 (6.13%)	51 (7.42%)	
1	68 (5.48%)	55 (8.01%)	
2	1093 (88.1%)	579 (84.3%)	
Years of Schooling Completed (Female Head)	9.17 (3.50)	9.27 (3.65)	0.561
Expected or actual childcare cost (Female head)	9.06 (16.7)	12.9 (19.4)	<0.001
Reason why female head did not look for work:			.
.	3 (0.24%)	2 (0.29%)	
Employed	551 (44.4%)	266 (38.7%)	
Laid off	14 (1.13%)	6 (0.87%)	
In school	21 (1.69%)	21 (3.06%)	
Institutionalized	0 (0.00%)	1 (0.15%)	
Available wages too low	17 (1.37%)	8 (1.16%)	
Did not want to work	105 (8.47%)	60 (8.73%)	
Ill or disabled	5 (0.40%)	3 (0.44%)	
Self-employed	9 (0.73%)	4 (0.58%)	
Retired	22 (1.77%)	10 (1.46%)	
Has job but has not started working	8 (0.65%)	6 (0.87%)	
Too difficult to get to town	0 (0.00%)	1 (0.15%)	
Wanted to help with family farm	1 (0.08%)	0 (0.00%)	
Labor dispute	1 (0.08%)	1 (0.15%)	
Unpaid vacation	8 (0.65%)	3 (0.44%)	
No jobs available	14 (1.13%)	8 (1.16%)	

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	0 N=1421	1 N=752	p.overall
Wanted to take care of family	430 (34.7%)	268 (39.0%)	
Child care too expensive	15 (1.21%)	11 (1.60%)	
Pregnancy	14 (1.13%)	8 (1.16%)	
In-job training	2 (0.16%)	0 (0.00%)	
Number of Hours Worked Past Week (Female Head)	330 (142)	319 (145)	0.100
Total Earnings in 1973 (Female Head)	1203 (1674)	1018 (1524)	0.015
Total Earnings in 1974 (Female Head)	1564 (2102)	1257 (2006)	0.002
Number of Weeks Worked in 1974 (Female Head)	21.7 (23.8)	18.0 (23.0)	0.001
Number of Weeks Worked in 1973 (Female Head)	16.9 (20.2)	14.5 (19.1)	0.010

The descriptive statistics show that the participants and the non-participants do not differ significantly in terms of being single individuals, single or double headed households. Furthermore, the age of heads, whether the household owns a house, their liquid asset holdings or liabilities do not play a significant role.

As can be expected, the assignment to plans seems to be very significant in determining whether or not the household continues with the experiment. Drop out rate is much higher in the control group and much less in more generous treatment groups such as plans 1 and 2.

Furthermore, the males in these households are more educated, have worked more hours in the past year, are more likely to be employed and have higher earnings. As for female heads, the most significant difference seems to be the expected or actual cost of childcare with the participating female heads reporting higher costs. As opposed to the male heads, the female heads in the participating group typically work less hours and weeks in a year and have less reported earnings than those that did not enroll or dropped out. This might suggest that in the participating group, the fact that the female head is at home and can file the monthly report and respond to interviews made it easier for these families to participate in the experiment.

An important difference for our question is the number of children. The participating families have on average more children. 65.9% of households in non-participants have no children, which is 57.7% for the participating group. Together with the difference in childcare cost reported by female heads in participants and non-participants, this difference suggests that if the families self-selected themselves to treatment, it is most likely due to the motives of supporting their already

born children rather than planning to have children.

References

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