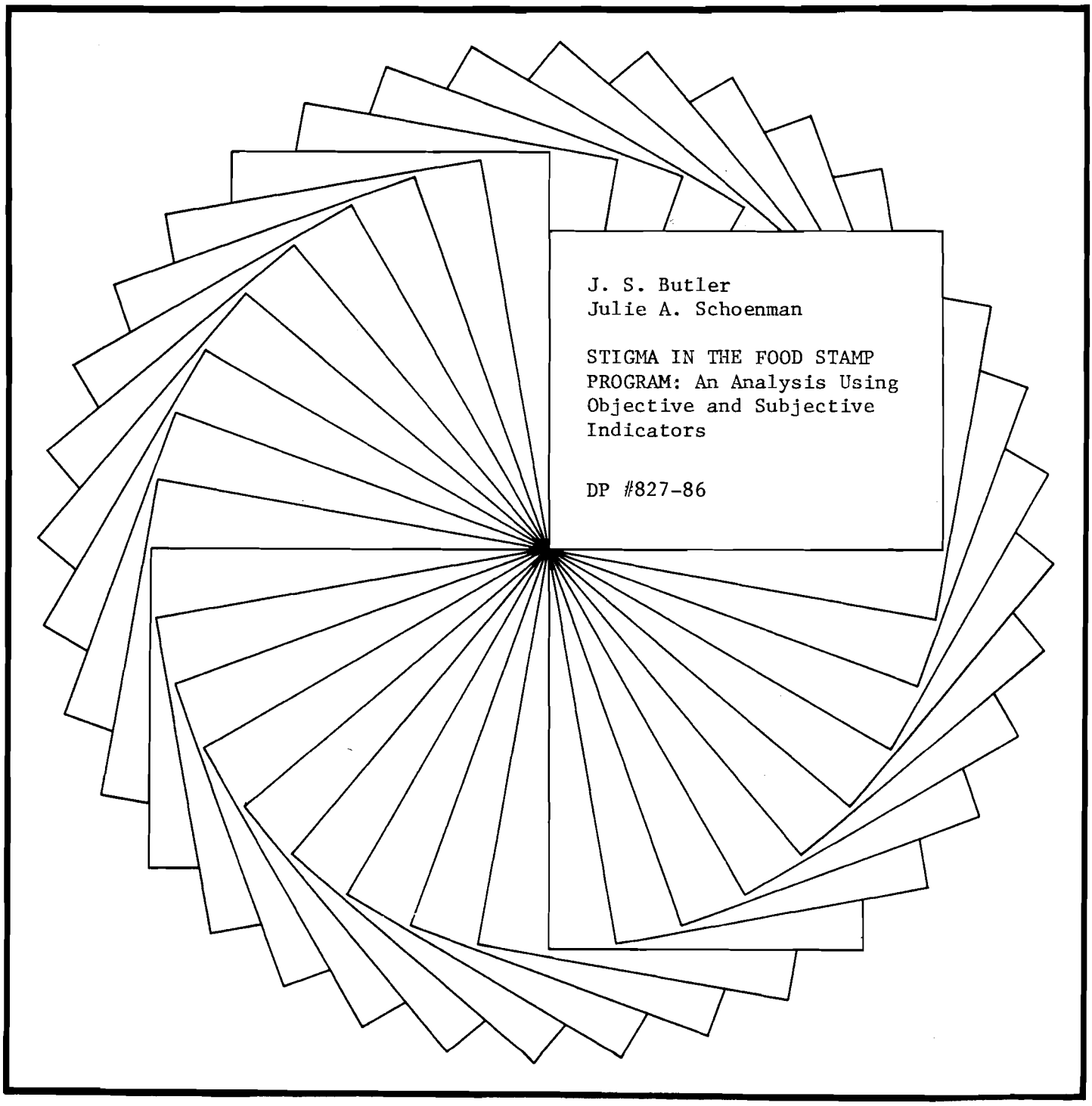
University of Wisconsin-Madison

IRP Discussion Papers



Institute for Research on Poverty
Discussion Paper No. 827-86

STIGMA IN THE FOOD STAMP PROGRAM: AN ANALYSIS USING OBJECTIVE AND SUBJECTIVE INDICATORS

J. S. Butler
Julie A. Schoenman

Department of Economics
Vanderbilt University

December 1986

This paper was prepared under the Small Grants program sponsored by the Institute for Research on Poverty and the U.S. Department of Health and Human Services. The views expressed are those of the authors and not of the Institute or the Department.

Abstract

Many eligible persons do not receive food stamps. Explanations for that fact include monetary cost and welfare stigma. This paper analyzes data on eight indicators of stigma. Some refer to actual or planned behavior toward the Food Stamp Program, and others refer to being embarrassed or bothered by welfare, or the perceived respect of the community for recipients. Several questions are investigated. What predicts stigma, measured in various ways? Do the indicators measure the same underlying concept? Is recipiency of food stamps an indicator of stigma, similar to the subjective measures, or is it a measure of economic costs of participation? The data come from the Food Stamps Cashout Project, a study of elderly eligibles' responses to substituting cash for food stamps in sites in New York, South Carolina, and Oregon.

Based on tetrachoric correlation coefficients and univariate and ordered probit models, the indicators are different, but the effects of other variables are similar in predicting participation and the other measures. In particular, higher bonus amounts predict less likely participation and more likely embarrassment. The results are more favorable to the stigma interpretation than to the cost interpretation.

STIGMA IN THE FOOD STAMP PROGRAM: AN ANALYSIS USING OBJECTIVE AND SUBJECTIVE INDICATORS

Section 1. Introduction

Many persons who are eligible to receive food stamps choose not to do so. In the Food Stamps Cashout project Blanchard et al. (1982) found the participation rate to be only 70%. This rate fell to only 50% when the sample was reweighted to be representative of the population. Beebout (1980) estimated a 47% participation rate using microsimulation, while the U.S. General Accounting Office (1976) estimated that only 76% of those eligible actually participate.

These low participation rates are difficult to explain in the face of standard microeconomic theory, which predicts that the outward shift in a person's budget constraint, occasioned by the receipt of food stamps, will increase utility. It is not likely that the monetary investment required to obtain food stamps is large enough to offset these utility gains. Since the elimination of the purchase requirement in 1979, the economic costs of obtaining food stamps is now trivial for most people--involving nothing more than time and transportation costs. Still, despite the low monetary investment required and the large benefits attainable, a sizable number of eligible persons decide not to participate. A possible explanation for this fact is welfare stigma.

This paper analyzes data on eight indicators of stigma. Some of these indicators are objective in that they refer to observable behavior (e.g., is the person currently participating in the food stamp program?). Others are subjective, referring to self-assessed feelings such as whether one would be embarrassed to receive food stamps. A

number of questions will be investigated. First, what are the determinants of stigma associated with welfare programs? Second, do the objective and subjective indicators measure the same thing? If they do, then the use of self-assessed stigma indicators in place of behavioral measures is justified. This would be an advantage, since behavioral measures, based on being eligible but turning down the benefits, are harder to obtain. Finally, assuming that all of the indicators can be treated as measuring the same factor, a model is estimated to assess the strength of stigma required to "turn on" each indicator.

The remainder of the paper is organized as follows. Section 2 presents the theory used in this paper. Section 3 discusses the data set and the indicators of stigma. The models and the estimation results are presented in Section 4. Finally, Section 5 contains the conclusions, including the implications of the results for the interpretation of data on stigma and for policy-making.

Section 2. The Theory of Stigma

In presenting the theory, three aspects are discussed here: first, an abstract, formal definition; second, the set of measures used in this study to indicate stigma; and third, an econometric model.

Stigma is a preference over sources of income, independent of the amount of income or the cost of obtaining it. Many examples exist; working for the "military-industrial complex" was once a source of stigma. Welfare stigma is thus a nonpecuniary cost of obtaining welfare income. The main question about welfare stigma is how one can attribute the failure to accept welfare income to stigma, rather than to some other factor. The only answer is that one must control for other factors which may influence the acceptance of welfare. These other factors

include the explicit monetary benefits and costs of welfare, physical/logistical difficulties in getting to the food stamp office, informational problems, and legal restrictions on the use of the welfare income obtained, which reduces the implicit value of the food stamps. All are measured and controlled here to some degree.

The benefits of welfare are represented by the nominal amount of food stamps available. As mentioned above, the elimination of the purchase requirement (where a sum of money was traded for a larger face value of food stamps) has reduced the monetary cost of obtaining this welfare to time and transportation costs only. These costs are reflected by the distance one must travel to the food stamp office. Even when this distance is small, mobility of the elderly can be highly restricted. Measures of the frequency with which a person gets out of his home are used to control for that factor. Informational problems exist when people fail to receive food stamps simply because they think that they are ineligible to receive them. These people are not declining welfare income because of stigma. Thus, all persons who indicate that they thought themselves ineligible are eliminated from the present analysis. Finally, legal restrictions (e.g., not being able to buy liquor or tobacco with food stamps), hardly seem, a priori, to be likely problems for the elderly. After all, food stamps do shift out the budget constraint, and restrictions should not lead to turning the food stamps down.

Indicators of stigma can be objective or subjective. Objective measures refer to observable or intended behavior, such as accepting food stamps. Subjective measures refer to feelings as reported by a person, such as embarrassment. A person may not report any subjective

difficulties, yet still not accept food stamps, or may be embarrassed but not respond overtly. The indicators may be very highly correlated or associated to a lesser degree.

An estimable model expressing the foregoing notions is as follows. Assume that stigma felt by person i, S_i, is an index which is a function of various personal, geographic, and economic factors. The larger stigma is, the more likely it is that any one of the indicators, I_j, will "switch on" or be observed. However, the indicators differ with respect to the ease with which they occur. For example, it is easier to turn down money once than to do so permanently (i.e., it is easier to choose not to participate now than to state that one will <u>never</u> participate). Similarly, it may or may not be easier to turn down money than to be embarrassed. Both stigma and the degree of stigma required to turn on an indicator are subject to individual random disturbance. Thus, mathematically, S is stigma, ℓ is a limit above which an indicator I is observed to change, equal to an average value γ plus an individual disturbance η; $\underline{X}$ is a set of exogenous explanatory factors, β is a set of coefficients, and ε and η are disturbances:

$$S_i = \underline{X}_i'\underline{\beta} + \varepsilon_i, \quad \varepsilon_i \sim N(0,\sigma^2),$$

$$\ell_{ij} = \gamma_j + \eta_{ij}, \quad \eta_{ij} \sim N(0,\sigma_j^2).$$

Indicator j for person i is defined by

$$I_{ij} = \begin{cases} 1 & \text{if} \quad S_i > \ell_{ij}, \\ 0 & \text{if} \quad S_i \leq \ell_{ij}. \end{cases}$$

Thus,

$$I_{ij} = 1 \text{ if } \underline{X}_i'\underline{\beta} - \gamma_j + \varepsilon_i - \eta_{ij} > 0.$$

This defines a probit model. Assuming ε_i and all η's are stochastically independent of each other, the single-common-factor covariance structure of Butler and Moffitt (1982) applies. Dummy variables are used to estimate all but one of the γ's, one of the limits being set equal to zero.

Note that $\underline{\beta}$ is assumed to be the same for all indicators, i.e., that one concept of stigma applies to all of the indicators. If that is the case, it implies that self-assessed measures are adequate to assess stigma. If not, the indicators refer to different functions. The hypothesis that $\underline{\beta}$ is the same for all of the indicators is tested.

Section 3. The Data

The data are drawn from the Food Stamps Cashout project, which provided cash or food stamps to elderly persons (over 64 years of age) in sites in New York State, South Carolina, and Oregon. Aside from demographic data and information used to ascertain the eligibility of the respondents, data were obtained on a variety of indicators of stigma. (For more information see Blanchard et al. (1982).) Brief descriptions are provided in an appendix to this paper.

The first three indicators of stigma are objective measures. The failure to receive food stamps (not now) is an objective fact. Similarly, the failure to have made any formal effort to find out whether one is eligible to receive food stamps (no try) and an assertion that one would never accept food stamps (never participate) are measures of objective behavior. One cannot be sure about one's future behavior, but such an assertion at least refers to observable behavior. In addi-

tion, five subjective measures are also available. Four inquire whether one is, or would be, "bothered" or "embarrassed" by the Food Stamp program or SSI. The fifth inquires whether the community has less respect for people who receive food stamps. While we consider this last indicator to be subjective, note that this question could also be answered objectively in the sense that anyone could answer without regard to feelings or behavior. If this is the case, this variable would generate quite different results.

For the purposes of analyzing the raw data for the indicators, 1867 observations of the eight indicators are available. As discussed above, all persons who believe themselves to be ineligible (92 of 1867) are eliminated due to theoretical considerations, leaving 1775 observations. For the regressions, various data are missing, reducing the sample size to 1525 observations for each of the eight indicators. The combined models, therefore, have 12,200 observations.

Section 4. Models and Results

The models used to analyze the indicators of stigma are as follows. The raw data are analyzed using tetrachoric correlation coefficients. Individual probit models are estimated for each of the indicators. The possibility of combining the indicators is tested. They are then combined in a multivariate probit model to estimate the strength of stigma required to turn on each indicator. Regardless of the results of the test, the results of the one-equation model are discussed.

Section 4.1. Tetrachoric Correlation Coefficients

In order to assess the relationships among the indicators in the raw data, a measure of correlation appropriate for dummy variables

must be used. The indicators of stigma are all assumed to be representative of an underlying scale of stigma which is continuous and normally distributed with unrestricted range. The maximum likelihood estimator of the correlation coefficient between two dummy variables under these circumstances is the tetrachoric correlation coefficient (tcc). The tetrachoric correlation coefficient between two dummy variables is 1.0 or -1.0 not only when they are always both one or both zero or always add to unity, as the Pearson product-moment correlation is, but also when an off-diagonal combination--(1,0) or (0,1)--fails to occur. The only way a cell can be empty with underlying bivariate normality is for the bivariate normal to be restricted to a line in the plane, i.e., the correlation is 1.0 or -1.0.

Table 1 shows the tcc for the eight measures of stigma. (Table 2 shows the raw data.) Standard errors are shown above the main diagonal and omitted below it to make the table easier to read. We note that the standard error is always a small fraction of the estimated correlation. The first three measures (no try, never participate, and now now) have a sequential relationship. If a person never participated, she or he does not participate now. If a person has not tried to find out if she or he is eligible, then she or he has never participated. Thus the tcc's in the upper left corner of Table 1 are 1.0.

The average correlation in Table 1 (based on the 28 unique, non-diagonal elements) is 0.390. In the multivariate probit model estimated with these data, the estimated correlation coefficient is 0.329. However, that model excludes the unitary correlations, since all the correlations are the same and necessarily less than one, if the likelihood

Table 1

Tetrachoric Correlation Coefficients Between
Pairs of Stigma Indicators
(standard errors in parentheses)

	No Try	Never Partici-pate	Not Now	Bothered		Embarrassed		Less Respect
				FSP	SSI	FSP	SSI	
Did not try to find if eligible	1.000	1.000 (.0000)	1.000 (.0000)	0.289 (.0060)	0.257 (.0026)	0.439 (.0040)	0.164 (.0045)	0.061 (.0053)
Would never participate	1.000	1.000	1.000 (.0000)	0.209 (.0065)	0.199 (.0027)	0.388 (.0042)	0.086 (.0048)	0.043 (.0058)
Not partici-pating now	1.000	1.000	1.000	0.114 (.0088)	0.173 (.0034)	0.334 (.0100)	0.007 (.0064)	0.005 (.0080)
Bothered by FSP	0.289	0.209	0.114	1.000	0.632 (.0087)	0.750 (.0121)	0.722 (.0163)	0.310 (.0064)
Bothered by SSI	0.257	0.199	0.173	0.632	1.000	0.769 (.0244)	0.719 (.0152)	0.277 (.0027)
Embarrassed by FSP	0.439	0.388	0.334	0.750	0.769	1.000	0.523 (.0036)	0.216 (.0039)
Embarrassed by SSI	0.164	0.086	0.007	0.722	0.719	0.523	1.000	0.233 (.0049)
FSP loses respect	0.061	0.043	0.005	0.310	0.277	0.216	0.233	1.000

Total sample size is 1775 in all cases.

Table 2

Indicators of Stigma

Main diagonal: number of persons answering yes
Off diagonal: number of persons answering yes to both row and column questions

	No Try	Never Participate	Not Now	Bothered FSP	Bothered SSI	Embarrassed FSP	Embarrassed SSI	Less Respect
No try	297	297	297	106	22	63	55	63
Never participate	297	354	354	109	22	65	55	72
Not now	297	354	589	149	31	84	77	111
Bothered by FSP	106	109	149	383	50	116	159	120
Bothered by SSI	72	22	31	50	65	43	47	25
Embarrassed by FSP	63	65	84	116	43	146	62	45
Embarrassed by SSI	55	55	77	159	47	62	229	69
Less respect	63	72	111	120	25	45	69	332

Total sample size is 1775 in all cases.

function is to be defined. The average correlation in Table 1, excluding the three unitary correlations, is 0.317.

Turning to the individual correlations, one finds that the variables measuring bother and embarrassment are highly correlated (0.523 to 0.769). The objective measures--not trying to find if one is eligible, never participating, and not now participating--are less correlated with bother and embarrassment (0.007 to 0.439). Whether the community has less respect for recipients of food stamps has quite small correlations with the observable, behavioral measures. In five of six cases, observable behavior toward the Food Stamp program correlates more highly with the bother and embarrassment variables when the FSP is the basis than when SSI is. Bother and embarrassment have fairly large correlations with observable behavior, however.

Table 1 indicates that the various measures, while correlated, measure different feelings. The bother and embarrassment variables are more associated with outward behavior than are the perceived feelings of the community toward food stamp program recipients.

Section 4.2. Separate Probit Models

Each of the indicators is used as the dependent variable in a probit model. In order to indicate patterns, the signs and significance of the coefficients are displayed in Table 3. Table 4 presents all of the coefficients and standard errors. Here we discuss only the general patterns. A few variables are significant and of consistent sign in many or all equations. Black people are less likely to respond to any of the indicators of stigma. More educated people are more stigmatized in most cases. The greater the amount of food stamps for which a person is eligible or the more income the person has without

Table 3

Signs and Significance of the Coefficients in the Individual Probits
(based on MLE)

	Participate?			SSI		FSP		
	No Try	Never	Not Now	Bother.	Embarr.	Bother.	Embarr.	Respect
Constant	- *	- *	- *	- *	- *	- *	- *	- *
Age minus 64	+	+	+	-	- *	-	+	-
Black	- *	- *	- **	- *	- *	- *	- *	- *
Male	-	-	+	- **	-	- **	-	-
Education	+ *	+ *	+ *	+ *	+ *	+	+ **	-
Lives Alone	- **	-	-	-	-	-	+	+
Site:								
NY Demo.	-	- **	- **	+ *	+	-	+	+
NY Comp.	+	+	+	+	-	-	-	-
SC Demo.	+	+ **	+ *	-	- *	- *	- *	-
SC Comp.	+	+	+	-	- *	- *	-	+
OR Demo.	- **	- **	- **	+ **	-	+	-	+
FS Bonus	+ *	+ *	+	+ *	+ *	+ *	+ *	+
NonFS Income	+ *	+ *	+ *	+	+	+ **	+ *	-
Out Daily	-	-	+	-	+	-	+	-
Out Weekly	-	-	+	-	+	-	-	+
Male-Alone	+ **	+	+	+	-	+	-	+
Distance	+	+	+ **	+	-	+ **	+	-
Assets	+	+	+ **	+	+	+	-	-
Rural	+	+	+	+	+	+	+	-
Knowledge	-	-	-	-	+	+	-	+

*significant at the 5% level
**significant at the 10% level

Table 4

	No Try	Never Partic-ipate	Not Now	Bothered SSI	Embar-rassed SSI	Bothered FSP	Embar-rassed FSP	Less Respect
Constant	-2.0677	-2.0146	-1.6878	-2.4807	-1.0521	-0.8058	-2.2208	-0.7850
	(0.3630)	(0.3726)	(0.3894)	(0.4402)	(0.4045)	(0.3388)	(0.5372)	(0.3811)
Age minus 64	0.0822	0.0634	0.0906	-0.0588	-0.2480	-0.0918	0.1184	-0.0148
	(0.0615)	(0.0622)	(0.0671)	(0.0841)	(0.0829)	(0.0656)	(0.0850)	(0.0672)
Black	-0.3725	-0.2913	-0.1563	-0.4806	-0.3701	-0.4261	-0.8559	-0.2671
	(0.0898)	(0.0910)	(0.0974)	(0.1069)	(0.1217)	(0.0919)	(0.1620)	(0.0953)
Male	-0.1840	-0.0586	0.3013	-0.6675	-0.3788	-0.4243	-0.2057	0.0823
	(0.2817)	(0.2956)	(0.3075)	(0.3156)	(0.2947)	(0.2403)	(0.3950)	(0.2658)
Education	0.4329	0.3775	0.3325	0.5671	0.3390	0.1452	0.2857	-0.1267
	(0.1233)	(0.1250)	(0.1275)	(0.1535)	(0.1451)	(0.1210)	(0.1593)	(0.1252)
Alone	-0.4760	-0.4133	-0.2271	-0.4574	-0.1344	-0.2248	0.0592	0.0751
	(0.2591)	(0.2704)	(0.2787)	(0.2917)	(0.2556)	(0.2129)	(0.3597)	(0.2476)
Sites:								
NY Demonstration	-0.2730	-0.3281	-0.2969	0.6969	0.0579	-0.1066	0.1313	0.0766
	(0.1702)	(0.1743)	(0.1807)	(0.1831)	(0.1749)	(0.1731)	(0.1852)	(0.1684)
NY Comparison	0.0546	0.0542	0.1737	0.2666	-0.1381	-0.1907	-0.0993	-0.2510
	(0.1523)	(0.1543)	(0.1603)	(0.2070)	(0.1541)	(0.1551)	(0.1671)	(0.1610)
SC Demonstration	0.1470	0.2453	0.2641	-0.0883	-0.3973	-0.3989	-0.5351	-0.0043
	(0.1291)	(0.1355)	(0.1452)	(0.1661)	(0.1499)	(0.1484)	(0.1820)	(0.1385)
SC Comparison	0.0907	0.1201	0.1095	-0.1055	-0.5062	-0.2950	-0.1258	0.1957
	(0.1394)	(0.1444)	(0.1553)	(0.1838)	(0.1694)	(0.1574)	(0.1753)	(0.1421)
OR Demonstration	-0.2580	-0.2800	-0.2266	0.3423	-0.0984	0.0949	-0.0160	0.2022
	(0.1419)	(0.1409)	(0.1394)	(0.1546)	(0.1425)	(0.1379)	(0.1544)	(0.1382)
FS Bonus	0.6635	0.5812	0.2579	0.9177	0.4250	0.4234	0.6696	0.1481
	(0.1855)	(0.1900)	(0.1957)	(0.2128)	(0.2041)	(0.1819)	(0.2405)	(0.1847)
Non-FS Income	2.7916	3.1103	2.6034	1.1034	0.4883	0.8832	1.6601	-0.4540
	(0.5883)	(0.6626)	(0.7506)	(0.6242)	(0.6482)	(0.5106)	(0.6865)	(0.5789)
Assets	-0.0339	-0.0673	0.0689	-0.0444	0.0282	-0.0211	0.0950	-0.0647
	(0.1097)	(0.1099)	(0.1130)	(0.1315)	(0.1343)	(0.1133)	(0.1478)	(0.1174)
Out Daily	-0.1381	-0.2092	0.0212	-0.0386	0.0509	-0.0129		0.0292
	(0.1211)	(0.1206)	(0.1225)	(0.1436)	(0.1466)	(0.1234)	(0.1618)	(0.1275)

Table 4 (continued)

	No Try	Never Partic-ipate	Not Now	Bothered SSI	Embar-rassed SSI	Bothered FSP	Embar-rassed FSP	Less Respect
Out Weekly	0.5176	0.4060	0.1161	0.0248	-0.0360	0.3654	-0.2195	0.0037
	(0.2980)	(0.3115)	(0.3275)	(0.3528)	(0.3279)	(0.2621)	(0.4234)	(0.2849)
Male Alone	0.0680	0.0809	0.1041	0.1074	-0.0058	0.1002	0.0098	-0.0059
	(0.0116)	(0.0137)	(0.0211)	(0.0191)	(0.0076)	(0.0169)	(0.0068)	(0.0072)
Distance	0.9850	1.0148	1.3365	0.9620	0.5221	0.6165	-0.1150	-1.1557
	(0.7871)	(0.8200)	(0.9430)	(0.7680)	(0.8393)	(0.7912)	(0.8610)	(0.8511)
Rural	0.1232	0.1192	0.0840	0.0026	0.1546	0.1011	0.1448	-0.0090
	(0.1043)	(0.1107)	(0.1319)	(0.1435)	(0.1287)	(0.1200)	(0.1336)	(0.1064)
Knowledge	-0.0056	-0.0027	-0.0249	-0.0118	0.0126	0.0263	-0.0281	0.0506
	(0.0336)	(0.0344)	(0.0355)	(0.0434)	(0.0417)	(0.0344)	0.0428)	(0.0347)

food stamps, the more stigmatized she or he is. Various regional differences are observable, but the most interesting is that persons in South Carolina are more likely to act stigmatized and less likely to be bothered or embarrassed. Residence in South Carolina and age are the only variables to have systematically different effects on the subjective and objective indicators.

The fact that the potential food stamp bonus has the same effect in all the equations is quite important. If the bonus amount has only financial or budgetary significance, it should have a negative effect on not participating now and never participating and no effect on any other indicator. If it engenders stigma, it should have a positive effect on all indicators. The results reject the implications of the budgetary theory and do not reject the implications of stigma theory.

The hypothesis that all eight equations can be combined is rejected with a chi-squared value (based on the likelihood ratio) of 419.3 and 140 degrees of freedom. The likelihood is 4920.5 for the combined equation and 4710.8 for the individual equations. This test maintains the hypothesis that the disturbances are independent of each other. The test was redone using the method of moments to estimate the variance-covariance matrix, taking the correlation of the disturbances into account. A gigantic chi-squared value of 2778.3 resulted from this test. The different results of the two tests arise owing to the high positive correlations which make all differences far more significant.

At this point, one can either ignore the results for the combined equation as irrelevant, treat them as a statistical experiment, or take them seriously as part of the planned study. We follow the last course.

Section 4.3. One Probit Model

The results of the combined estimation of one equation are presented in Table 5. Three estimates are presented. One arises under the MLE of the model with the single common factor covariance structure. The other two represent MLE with independent disturbances, consistent for the parameters and inconsistent for the standard errors, and estimated the method of moments (MOM) with an unrestricted variance-covariance matrix. Black persons are again less likely to be stigmatized while better educated persons are more so. One difference from the single equation estimation is that persons who live alone are significantly less likely to be stigmatized while males living alone are significantly more so. The net result is that females living alone are less likely to be stigmatized than other people are. Generally, the signs of coefficients match the previous results, but the significance does not. No significant site effects are observed in the combined estimates, but all economic variables (food stamp bonus, non-food stamp income, and assets) increase stigma. The distance variable contributes significantly when the unrestricted estimation is used.

All of the levels at which indicators "turn on" are significantly greater than zero, the fixed value of the cutoff point for not participating now. Note that the coefficients estimated in Table 5 are the negatives of the relevant limits. The order in which the indicators turn on is: bothered by SSI (last), embarrassed by food stamps, embarrassed by SSI, not trying to find out if you are eligible, never participating, community has less respect, bothered by food stamps, and not participating now (first). Bother and embarrassment are not the same, but they stand in no clear relationship to each other. The limits for the long-

Table 5

Estimation of One Probit Model for All Eight Indicators

Covariances: Estimation by:	Equal MLE	Zero MLE	Unrestricted MOM
Constant	-0.84761*	-0.97485*	-1.00655*
	(0.13244)	(0.13625)	(0.14204)
Age minus 64	0.00063	-0.00042	-0.00025
	(0.00253)	(0.00242)	(0.00247)
Black	-0.36203*	-0.32230*	-0.31697*
	(0.05019)	(0.03639)	(0.03650)
Male	-0.21924*	-0.11311*	-0.09884
	(0.10843)	(0.09698)	(0.09964)
Education	0.01982*	0.02448*	0.02445*
	(0.00532)	(0.00459)	(0.00463)
Alone	-0.23550*	-0.22037*	-0.21477*
	(0.10039)	(0.09002)	(0.09302)
Sites:			
NY Demonstration	-0.07559	-0.07030	-0.07674
	(0.06537)	(0.06225)	(0.06316)
NY Comparison	0.05051	-0.03605	-0.03952
	(0.05854)	(0.05343)	(0.05387)
SC Demonstration	-0.02278	-0.05084	-0.04256
	(0.05848)	(0.04906)	(0.04901)
SC Comparison	-0.00890	-0.04737	-0.03857
	(0.05947)	(0.05180)	(0.00522)
OR Demonstration	-0.00327	-0.05017	-0.05502
	(0.05767)	(0.05156)	(0.05217)
Economic ($):			
FS Bonus	0.00456*	0.00445*	0.00440*
	(0.00066)	(0.00067)	(0.00069)
Non-FS Income	0.00121*	0.00155*	0.00160*
	(0.00021)	(0.00019)	(0.00020)
Assets (10000s)	0.78670*	0.55291*	0.52466*
	(0.37258)	(0.26784)	(0.26556)

Table 5 (continued)

Covariances: Estimation by:	Equal MLE	Zero MLE	Unrestricted MOM
Out Daily	0.02295	-0.01308	-0.01400
	(0.04954)	(0.04442)	(0.04464)
Out Weekly	-0.05736	-0.04006	-0.03949
	(0.05510)	(0.04833)	(0.04871)
Male-Alone	0.29574*	0.19349**	0.18912**
	(0.12044)	(0.10449)	(0.10693)
Distance (0.1 mile)	0.00349	0.00590*	0.00607*
	(0.00274)	(0.00226)	(0.00224)
Rural	0.06553	0.09007*	0.09296*
	(0.04543)	(0.03823)	(0.03843)
Knowledge	0.00307	0.00323	0.00544
	(0.01505)	(0.01310)	(0.01306)
Questions:			
No try	-0.62306*	-0.59183*	-0.58463*
	(0.08527)	(0.05208)	(0.05191)
Never participate	-0.46453*	-0.44233*	-0.43811*
	(0.09321)	(0.05065)	(0.05050)
Bothered--SSI	-1.36606*	-1.40078*	-1.39280*
	(0.07711)	(0.07071)	(0.07133)
Embarrassed--SSI	-0.67651*	-0.68935*	-0.68584*
	(0.05321)	(0.05345)	(0.05378)
Bothered--FSP	-0.31639*	-0.33008*	-0.32658*
	(0.04947)	(0.04968)	(0.04978)
Embarrassed--FSP	-0.98825*	-0.99579*	-0.98600*
	(0.06543)	(0.05838)	(0.05877)
Less Respect	-0.38816*	-0.40534*	-0.41796*
	(0.04727)	(0.05124)	(0.05170)
Covariance of indicators	0.32902		
	(0.01655)		

*significant at the 5% level.

run objective behavior are ranked in the middle of the ranges for the various subjective measures. Because of that fact, and the fact that the signs in Table 3 are similar in most cases for both objective and subjective indicators, there is evidence that the indicators may share their causes to some degree, meaning that objective and subjective measures may both indicate stigma. Still, the equations themselves were vigorously rejected by the statistical test.

The estimated correlation of the indicators is 0.32902. This means that about 10% (0.32902^2) of the variance of the disturbances is in the variance of the stigma, while 90% is in the limits. Therefore, most of the disturbance is found in the interpretation of the questions, which supports their noncomparability.

Section 5. Conclusions

The principal conclusions of this analysis are as follows. The subjective and objective indicators of stigma have positive but unequal correlations. The correlations are higher between bother and embarrassment and the objective indicators than between perceived lesser respect of the community and the objective indicators. The latter relationships are particularly weak. The model of stigma which assumes that all indicators are measures of the same underlying variable, with only a random disturbance differentiating them, indicates that deciding never to participate is broadly equivalent to being bothered or embarrassed, but not participating currently is a lower hurdle. This could indicate that somewhat less stigma is associated with occasional participation. The hypothesis that all the indicators measure the same underlying variable is rejected. Therefore, each of the indicators is meas-

ured with error relative to any other and they cannot be used interchangeably in models.

The potential food stamp bonus amount is significantly and negatively related to participation--greater benefit deters participation. If this results from stigma attached to the receipt and use of food stamps, then the same effect should be observed on the subjective indicators. If, instead, this nonparticipation results from an inability to pay the economic costs of getting the stamps, i.e., transportation and time costs, then the potential bonus should have no effect on the subjective measures. The results indicate that a greater potential bonus amount is associated with greater bother and embarrassment, contradicting the cost interpretation in favor of the stigma hypothesis.

The only other variables in the analysis found to have significant effects, in general, on the indicators of stigma are race, total income, and being from South Carolina as opposed to Oregon or New York. Blacks are more likely to participate and less likely to be embarrassed at receiving food stamps or SSI. Persons of higher total income are less likely to receive food stamps and insignificantly more likely to be embarrassed or bothered. Persons from South Carolina are somewhat less likely to participate, but somewhat less likely to be embarrassed.

References

Beebout, Harold, "Food Stamp Policy Modeling: An Application of MATH." In Microeconomic Simulation Models for Public Policy Analysis, ed. Robert H. Haveman and Kevin Hollenbeck, Vol. 1. New York: Academic Press, 1980.

Blanchard, Lois, J. S. Butler, Pat Doyle, Russell Jackson, James C. Ohls, and Barbara M. Posner. "Final Report: Food Stamp SSI/Elderly Cashout Demonstration Evaluation." Princeton, NJ: Mathematica Policy Research, 1982.

Butler, J. S. and Robert Moffitt. "A Computationally Efficient Quadrative Procedure for the One-Factor Multinomial Probit Model." Econometrica 50 (1982): 761-764.

U.S. General Accounting Office. "Identification of Food Stamp Issues." Staff Paper, 1976.

APPENDIX: THE DATA

All of the data come from the Food Stamps Cashout Project, conducted by Mathematica Policy Research, Inc. This appendix describes the meaning of the variables used in this study. Everyone in the study is at least 65 years old and lives in a household of all elderly people. Practically everyone is in a household of one or two persons. Everyone in the study is eligible to receive food stamps, and 95% of them know it, according to the answer to a direct question.

Age. The age of the respondent is stated as years minus 64, which does not affect the interpretation of the coefficients, to avoid a large adjustment to the constant.

Black. This is a dummy variable: 1 for blacks, 0 for whites. Other races are negligible and classified as white.

Male. This is a dummy variable: 1 for males, 0 for females.

Education. This is measured in years of formal education.

Lives Alone. This is a dummy variable: 1 for persons who live alone, 0 for persons who live with someone else. Formal marital status is ignored.

Site. Six sites operated, three demonstration sites where cash was given, and three comparison sites where food stamps were given, to eligibles who applied for food stamps.

Food Stamp Bonus. This is the monthly amount of bonus stamps or cash for which the respondent is eligible. It is not the amount received, which is zero for nonparticipants.

Non-Food Stamp Income. This is the monthly amount of household income from all sources other than food stamps. Most of it is Social Security payments.

Out Daily. This is a dummy variable: 1 for persons who get out of the house daily or more often, 0 for those who get out less often than daily.

Out Weekly. This is a dummy variable: 1 for persons who get out of the house weekly but less often than daily, 0 for those who get out less often than weekly.

Male-Alone. This is the product of the dummy variables Male and Lives Alone.

Distance. This is the distance to the food stamp office in miles.

Assets. This is the value of assets, mostly bank accounts and automobiles.

Rural. This is a dummy variable: 1 for persons who identify their residences as being in a rural area, 0 for persons who identify their residences as being in a town or small city or larger city.

Knowledge. This is a measure of knowledge of nutrition, from 0 (low) to 4 (high). It is the number of the basic four food groups represented in the answer to the question "What kinds of foods do you think a person should eat to maintain good health?"

Indicators. Each is a dummy variable: 1 if the indicated sentiment or planned or actual behavior is present, 0 if not. Some of the questions are phrased differently for participants and nonparticipants. Each indicator is coded so that a 1 indicates stigma, 0 the absence of stigma.

No Try. Has the respondent ever tried to find out if he or she is eligible to receive food stamps? This is coded 1 if "no try" has been made, 0 if a try has ever been made. For participants, it is 0.

Never Participate. Would the respondent ever choose to receive food stamps? This is coded 1 if the respondent "never" would, 0 otherwise. For participants, this is 0.

Not Now. Is the respondent receiving food stamps? This is coded 1 for no, 0 for yes.

SSI--Bother. Is the respondent bothered or would she or he be bothered to receive SSI? This is coded 1 for yes, 0 for no.

SSI--Embarrassed. Is the respondent embarrassed or would she or he be embarrassed to receive SSI? This is coded 1 for yes, 0 for no.

FSP--Bother. Is the respondent bothered or would she or he be bothered to receive food stamps? This is coded 1 for yes, 0 for no.

FSP--Embarrassment. Is the respondent embarrassed or would she or he be embarrassed to receive food stamps? This is coded 1 for yes, 0 for no.

Respect. Does the community have less respect for persons who receive food stamps? This is coded 1 for yes, 0 for no.