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# The Conceptualization and Measurement of Social Mobility Differences: A Brief Reply to Rodgers and Mann\*

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## STRUCTURAL AND EXCHANGE MOBILITY

Based on the conceptual definition of social fluidity as social mobility that remains after controlling for group differences in origins and destinations, Rodgers and Mann (1993) suggest that there is little reason to believe that group differences in destinations should affect differences in social mobility between mentally disordered and general populations because these comparisons are made in a common class system. However, they fail to note that the conceptual distinction between exchange and structural mobility and the attachment of "structural" significance to group differences in origins and destinations are contradictory and vacuous (Sobel 1983) without evidence of quasi-symmetry in social mobility tables (Sobel 1988; Sobel, Hout, and Duncan 1985).

Because quasi-symmetry in three-strata social mobility tables is equivalent to quasi-independence (Agresti 1990), tests for conditional quasi-symmetry between groups assume four or more strata (Sobel 1988). As the results in Table 1 show, the null hypothesis of conditional quasi-symmetry is rejected in all the data sets with more than three stratum. It is not possible to separate social mobility into just structural and exchange mobility in any of these data sets.

## HYPOTHETICAL DATA

After their analysis of their hypothetical data sets for "no difference in mobility between groups" and "massive downward social mobility," Rodgers and Mann (1993, p. 167) conclude:

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The failure of the method to detect downward mobility in the second example ( $X^2 = 0$ ,  $df = 2$ ,  $p = 1.00$ ) and its capacity to construe significant mobility from the first ( $X^2 = 200$ ,  $df = 2$ ,  $p < .001$ ) had demonstrated its inadequacy. It was clear that the new technique was sensitive to a difference in social fluidity rather than to a difference in overall shift in status. Only the latter has been the concern of investigations into social selection and social drift.

## *No Difference in Social Mobility?*

The central issue here is not the results of the new technique of analysis ( $X^2 = 200$ ;  $df = 2$ ;  $p < .001$ ), but that Rodgers and Mann define social mobility only as net change between the marginal distributions of origin and destination status and ignore gross change in social mobility (Hagenaars 1990). Although an overall shift in status does not occur in either group, there is complete status inheritance in the general population group and no status inheritance in the psychotic group. Rodgers and Mann suggest that net change, structural mobility, has been the concern of previous social selection-drift investigations even though they associate structural mobility with temporal or societal differences in class structure and do not present any theoretical perspective that suggests how individual mental disorder might affect structural mobility (Hauser 1986; Sobel et al. 1985). Previous social selection-drift studies that attempted to distinguish between structural and exchange mobility sought to remove the effects of structural mobility in their analyses. Langner and Michael (1963, p. 425), for example, used relative rather than absolute intergenerational status comparisons because they conceptualized individual social mobility as occurring within the context of structural mobility.

By defining their hypothetical data as

TABLE 1. Log-Linear Models of Conditional Quasi-Symmetry, No Three-Factor Interaction, Rodgers and Mann’s Modified Log-Linear Model, and Contrasts for  $\tau_{jk}^{DG}$

	Conditional <sup>a</sup> Quasi-Symmetry	No Three- <sup>b</sup> Factor Interaction	Modified <sup>c</sup> Model	Contrast $\tau_{jk}^{DG}$
<b>Hypothetical Data</b>				
No Difference in Mobility		$L^2 = 277.26$ df = 2 p < .001	$L^2 = 277.26$ df = 4 p < .001	$L^2 = 0$ df = 2 p = 1.00
Massive Downward Mobility		$L^2 = 0$ df = 0 p = 1.00	$L^2 = 303.11$ df = 6 p < .001	$L^2 = 303.11$ df = 6 p < .001
<b>Data Sets</b>				
Birtchnell (1971)	$L^2 = 40.98$ df = 12 p < .001	$L^2 = 13.69$ df = 16 p = .62	$L^2 = 82.78$ df = 20 p < .001	$L^2 = 69.09$ df = 4 p < .001
Goldberg and Morrison (1963) <sup>d</sup>	$L^2 = 32.06$ df = 12 p < .005	$L^2 = 25.36$ df = 16 p = .06	$L^2 = 121.30$ df = 20 p < .001	$L^2 = 95.94$ df = 4 p < .001
Harris et al. (1956)		$L^2 = 2.73$ df = 4 p = .60	$L^2 = 9.97$ df = 6 p = .13	$L^2 = 7.24$ df = 2 p < .05
Langner and Michael (1963)		$L^2 = 2.02$ df = 4 p = .73	$L^2 = 26.47$ df = 6 p < .001	$L^2 = 24.45$ df = 2 p < .001
Turner and Wagenfeld (1967)	$L^2 = 103.37$ df = 20 p < .001	$L^2 = 30.05$ df = 25 p = .22	$L^2 = 84.28$ df = 30 p < .001	$L^2 = 54.23$ df = 5 p < .001
<b>Corrected Data Sets</b>				
Birtchnell (1997) <sup>e</sup>	$L^2 = 38.61$ df = 12 p < .001	$L^2 = 12.62$ df = 16 p = .70	$L^2 = 78.51$ df = 20 p < .001	$L^2 = 65.89$ df = 4 p < .001
Goldberg and Morrison (1963) <sup>e</sup>	$L^2 = 29.76$ df = 12 p < .005	$L^2 = 24.60$ df = 16 p = .08	$L^2 = 118.69$ df = 20 p < .001	$L^2 = 94.09$ df = 4 p < .001

<sup>a</sup> O = Origin, D = Destination, and G = Group in the following multiplicative models:

$F_{ijk} = \mu_g \beta_{og} \beta_{dg} \alpha_{13(og)} \alpha_{23(dg)} \delta_{odg}$  where  $\delta_{odg} = \delta_{dog}$  and  $\delta_{odg} = 1$  if  $o=d$  and number of strata  $\geq 4$  (Sobel 1988, p. 172).

<sup>b</sup>  $F_{ijk} = \tau \tau_i^{O_r} \tau_j^{D_r} \tau_k^{G_r} \tau_{ij}^{OD} \tau_{ik}^{OG} \tau_{jk}^{DG}$

<sup>c</sup>  $F_{ijk} = \tau \tau_i^{O_r} \tau_j^{D_r} \tau_k^{G_r} \tau_{ij}^{OD} \tau_{ik}^{OG}$

<sup>d</sup> Birtchnell’s (1971) control group is used as a control group for the Goldberg and Morrison (1963) study.

<sup>e</sup> These data use Rodgers and Mann’s corrected frequencies for Birtchnell’s (1971) data.

showing “no difference in mobility between groups” using an empirically unsupported conceptualization of structural and exchange mobility, Rodgers and Mann reject the measurement of social mobility differences between groups using three-factor interaction, a basic formulation of nearly all contemporary social mobility research (Agresti 1990; Clogg 1982; Goodman 1969, 1979, 1984; Hagenaars 1990; Hauser and Featherman 1977; Xie 1992). Their proposed modified test for social mobility differences between groups makes this explicit: “As a starting point, the use of the three-way interaction

term of origin  $\times$  destination  $\times$  group was rejected . . .” (Rodgers and Mann 1993, p. 167).

*Massive Downward Social Mobility?*

Rodgers and Mann suggest that the new method of analysis is rigorously refuted because it fails to reject the null hypothesis of no difference in social mobility for their hypothetical data of “massive downward social mobility” ( $X^2=0$ ; df=2; p=1.00). However, their analysis of these data is

flawed. The degrees of freedom for the new technique of analysis is 0 rather than 2. Because the new technique is a log-linear model of no three-factor interaction and has 0 degrees of freedom in this analysis, it must, by statistical definition, perfectly fit *all* the cell frequencies for both the psychotic and general population groups. Rodgers and Mann's emphasis on structural mobility leads them to confuse statistical necessity with "massive downward social mobility." The section on social mobility for the psychotic group in Rodgers and Mann's Table 3\* is completely determined by the margins for origin (26, 62, 49) and *destination* (0, 0, 137) status. This statistical constraint with the constraints of the total origin by destination cross-classification and group distributions of origin status determines all of the cell frequencies in both the psychotic and general population groups. No difference in social mobility between groups (three-factor interaction) is needed to predict perfectly the observed data. Rodgers and Mann's suggestion that group differences in destination status cannot have an effect on social mobility is not supported in their own hypothetical data.

## ANALYSES OF DATA SETS

### *Model Contrasts*

Table 1 also shows the results of analyses of social mobility differences between mentally disordered and general population groups.<sup>1</sup> Since the no three-factor interaction model and Rodgers and Mann's modified model are nested models that only vary in their assumption about group differences in destination ( $\tau_{jk}^{DG}$ ), contrasts between these models can be used to assess the effect that group differences in destinations have on the fit between observed and expected frequencies in these models (Agresti 1990; Hagenaars 1990). As the results for these contrasts in Table 1 show, the effect of group differences in destinations is statistically significant in each data set except the hypothetical data of no difference in mobility. Adding  $\tau_{jk}^{DG}$  to the model used by Rodgers and Mann in their analyses significantly improves its fit. Deleting  $\tau_{jk}^{DG}$  from the no three-factor interaction model significantly decreases its fit.

The  $\tau_{jk}^{DG}$  contrasts in Table 1 are the ones

that Rodgers and Mann (1993, p. 167) give as evidence of social selection-drift in their Table 6. These contrasts "identified significantly more downward and less upward mobility in the psychotic groups as compared with general population samples, as indicated by the destination  $\times$  group interaction term." Rodgers and Mann's substantive conclusions are, however, valid *only if* significant social mobility differences between groups are indicated by significant group differences in destinations. They are not.

By rejecting  $\tau_{ijk}^{ODG}$  as a measure of group differences in social mobility, Rodgers and Mann have no empirical measure of group differences in social mobility. How do they resolve this problem of link between substantive concern and measurement? Rodgers and Mann merely measure social mobility differences between groups with one of the remaining parameters in their log-linear model. The  $\tau_{jk}^{DG}$  term becomes a measure of group differences in destinations and *social mobility differences between groups*. Although Rodgers and Mann's reformulation of the analysis of intergenerational social mobility is based on confounded measurement, it does have novel implications.

### *Novel Implications*

Social causation and social selection-drift studies are both predicated on significant group differences in social status, a negative association between social status (destination) and mental disorder. However, because Rodgers and Mann do not use a unique and independent measure of social mobility differences between groups, their analyses could be used to suggest that significant differences in destination status result from unmeasured social causation processes rather than unmeasured social mobility differences. To disprove either interpretation empirically using Rodgers and Mann's reformulation and confounded measurement of social mobility differences, it would be necessary to disprove what nearly all previous studies have found and sought to explain through social causation and/or social selection-drift processes—a negative association between destination social status and mental disorder.

### *Which Models Fit?*

Rodgers and Mann's Table 5 shows the expected and observed frequencies of their

log-linear model for the Midtown Manhattan data. As Table 1 shows, their modified model does not fit the Midtown Manhattan data ( $L^2=277.24;df=4; p<.001$ ) or any other data set except the Harris et al. (1956) data.<sup>2</sup> Their modified model, by the absence of  $\tau_{jk}^{DG}$  and  $\tau_{ijk}^{ODG}$ , assumes that destination social status and mental disorder are independent and that social mobility does not vary between groups. Which of these assumptions prevents their modified model from fitting the observed data in any of the data sets except the Harris et al. (1956) data?

Adding  $\tau_{jk}^{DG}$  to Rodgers and Mann's modified model, assuming that destination social status and mental disorder are not independent, results in the no three-factor interaction model. As the results in Table 1 show, the model of no difference in social mobility between groups fits each data set except the hypothetical data of no difference in mobility. The assumption of no group differences in destination status rather than the assumption of no difference in social mobility between groups prevented Rodgers and Mann's modified model from fitting the observed data. Yet, Rodgers and Mann (1993, p. 168) maintain that their analyses "identified significantly more downward and less upward mobility in the psychotic groups as compared with general population samples . . . ."

SUMMARY

Rodgers and Mann's reformulation and analysis of intergenerational social mobility differences is inconsistent with recent theoretical and analytical advances in contemporary social mobility research (Hauser 1986), impedes the integration of knowledge across general and specialized areas of research (Pearlin 1992), and precludes any further investigation of more refined models of social mobility that might provide additional insight on social mobility and social mobility differences in mentally disordered and general population groups (Clogg 1982; Sobel 1988). Their reformulation and analysis of intergenerational social mobility differences does not alter the previous finding that "intergenerational social mobility differences between seriously mentally disordered and general population groups in previous studies provide very little, if any, evidence of empirical

support for social selection-drift process in serious mental illness" (Fox, 1990, p. 350).

NOTES

- 1. I was unaware of the Harris et al. (1956) study mentioned by Rodgers and Mann. I have included it because it is one of the few previous social selection-drift studies that gives full origin by destination social mobility tables for both mentally disordered and general population groups.

<sup>a</sup>Table VI. Harris et al. (1956, p. 111)

		Destination		
Origin		I and II	III	IV and V
I and II	Patient	6.0	15.0	8.0
	Comparison	13.8	12.3	2.9
III	Patient	2.0	30.3	19.0
	Comparison	6.3	31.0	13.7
IV and V	Patient	1.0	17.0	11.0
	Comparison	1.4	13.5	14.1

There are significant issues in the quality of data for the mentally disordered groups and general population in nearly all previous studies. For example, the Midtown Manhattan data is not "true" intergenerational social mobility data (Langner and Michael 1963, p. 425), the Harris et al. (1956) study uses the Glass (1954) data that Payne, Ford, and Robertson (1977) argue is implausible, while the Goldberg and Morrison (1963) study did not use a control group. Most studies use retrospective samples of patients in treatment (Dohrenwend et al. 1992). The issue here is not the quality of the data used by these studies, but the specific methodology used to reach their substantive conclusions about differences in social mobility.

- 2. The association between destination social status and mental disorder for the Harris et al. (1956) data is borderline ( $\chi^2=6.13; df=2; p=.05$ ).

REFERENCES

Agresti, Alan 1990. *Categorical Data Analysis*. New York: John Wiley.

Birtchnell, John 1971. "Social Class, Parental Social Class, and Social Mobility in Psychiatric Patients and General Population Controls." *Psychological Medicine* 1:209-21.

Clogg, Clifford C. 1982. "Some Models for the Analysis of Association in Multiway Cross-Classifications Having Ordered Categories." *Journal of the American Statistical Association* 77:803-15.

Dohrenwend, Bruce P., Itzhak Levav, Patrick E.

- Shrout, Sharon Schwartz, Guedalia Naveh, Bruce G. Link, Andrew E. Skodol, and Ann Stueve 1992. "Socioeconomic Status and Psychiatric Disorders: The Causation-Selection Issue." *Science* 255 (21 February):946-51.
- Fox, John W. 1990. "Social Class, Mental Illness, and Social Mobility: The Social Selection-Drift Hypothesis for Serious Mental Illness." *Journal of Health and Social Behavior* 31:344-53.
- Glass, David V. 1954. *Social Mobility in Britain*. Glencoe, IL: Free Press.
- Goldberg, E.M. and S.L. Morrison. 1963. "Schizophrenia and Social Class." *British Journal of Psychiatry* 109:785-802.
- Goodman, Leo A. 1969. "How to Ransack Social Mobility Tables and Other Kinds of Cross Classification Tables." *The American Journal of Sociology* 75:1-40.
- . 1979. "Multiplicative Models for the Analysis of Occupational Mobility Tables and Other Kinds of Cross-Classification Tables." *American Journal of Sociology* 84:804-19.
- . 1984. *The Analysis of Cross-Classified Data Having Ordered Categories*. Cambridge, MA: Harvard University.
- Hagenaars, Jacques A. 1990. *Categorical Longitudinal Data: Log-Linear Panel, Trend, and Cohort Analysis*. Newbury Park, CA: Sage.
- Harris, Arthur, Inge Linker, Vera Norris, and Michael Shephard. 1956. "Schizophrenia: A Prognostic and Social Study." *British Journal of Social and Preventive Medicine* 10:107-14.
- Hauser, Robert M. 1986. "Reinventing the Oxcart: Jones' Obsolete Proposal for Mobility Analysis." *Social Forces* 64:1057-65.
- and David L. Featherman. 1977. *The Process of Stratification: Trends and Analyses*. New York: Academic Press.
- Langner, Thomas S. and Stanley T. Michael. 1963. *Life Stress and Mental Health*. New York: Free Press.
- Payne, G., G. Ford, and C. Robertson. 1977. "A Reappraisal of Social Mobility in Britain." *Sociology* 11:289-310.
- Pearlin, Leonard I. 1992. "Structure and Meaning in Medical Sociology." *Journal of Health and Social Behavior* 33:1-9.
- Rodgers, Bryan and Susan L. Mann. 1993. "Re-Thinking the Analysis of Intergenerational Social Mobility: A Response to John W. Fox." *Journal of Health and Social Behavior* 34:165-72.
- Sobel, Michael E. 1983. "Structural Mobility, Circulation Mobility, and the Analysis of Occupational Mobility: A Conceptual Mismatch." *American Sociological Review* 48:721-27.
- . 1988. "Some Models for the Multiway Contingency Table with a One-to-One Correspondence Among Categories." Pp. 165-92 in *Sociological Methodology 1988*, edited by C.C. Clogg. Washington, DC: American Sociological Association.
- , Michael Hout, and Otis Dudley Duncan. 1985. "Exchange, Structure, and Symmetry in Occupational Mobility." *American Journal of Sociology* 91:359-72.
- Turner, R. Jay and Morton O. Wagenfeld. 1967. "Occupational Mobility and Schizophrenia: An Assessment of the Social Causation and Social Selection Hypotheses." *American Sociological Review* 32:104-13.
- Xie, Yu. 1992. "The Log-Multiplicative Layer Effect Model for Comparing Mobility Tables." *American Sociological Review* 57:380-95.

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