The Mathematical Sociologist

Newsletter of the Mathematical Sociology
* **Section of The American Sociological Association** *
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Summer, 1999

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Note from the Newsletter Editor

Barbara Meeker

This issue has information about ASA, section election results, a conference, a new web page, and a letter to the editor in response to Tom Fararo's discussion of a substantive issue in the last newsletter. Please remember that **it is important to attend the Section business meeting;** in order to maintain our status as an ASA section we need to have a quorum at our annual business meeting. There are several sessions of special interest to mathematical sociologists, and don't forget the Reception. I have also included as complete a listing as I can of the officers and committee members for this year. At least seventeen different departments appear on this list. Since the ASA guide to Graduate Departments lists about 120 Ph.D. granting departments in the U. S. for 1999, our officers and committees this year represented more than 10% of them. Although we are one of the smallest ASA sections, this indicates, I think,

that we are widely distributed among major research departments. We still are below the ASA minimum for Sections, however, so please encourage your friends, colleagues and students to join. (Yes, I know *you* have renewed your membership; ASA only sends the newsletter to paid-up members. It's the others who need some reminders)

Chair Statement

Tom Fararo

In my previous chair statement, I described a problem concerning structural balance theory and encouraged interested readers to submit some response. John Bramsen did so and his response is printed in this issue. Further comments on this topic or on any other topic in mathematical sociology will help to make the newsletter more interesting for all of us. In the future, perhaps the chair or the newsletter editor could invite comments from selected members on a particular theme.

For the present, however, I will defer any further such specification of topics or themes for discussion in the newsletter and only use this space to remind everyone of sessions and other events at the upcoming ASA meetings that pertain to mathematical sociology. By now, you should have received the Preliminary Program from ASA. Note that the meetings are in Chicago from August 6th to 10th.

Section Day. Our section day this year is the last day of the meetings, Tuesday, August 10th.
Reception. Our reception has been moved up one day and will occur on Monday, August 9th, at 6:30pm, joint with the Theory Section.
Awards Announcement. This is the first year in which the section will confer awards. Two committees have been hard at work reading books and papers and will have arrived at their decisions by the time

of the meetings.   The awards will be announced at the Business Meeting.

Business Meeting. This is scheduled for Tuesday morning at 9:30am.   Please make a special effort to attend since we need a quorum. Attendance also is important as part of our case to the ASA that we should continue as a section despite the fact that we have not (yet) reached the membership requirement of 300. Topics on the agenda overlap those listed below for the Council Meeting and, in addition, we will announce the section awards, as indicated above.

Council Meeting. Council members are reminded that we meet an hour before the Business Meeting, at 8:30am on Tuesday. Topics to be discussed in the Council and then summarized for further discussion in the Business Meeting include the awards procedure and plans for The Journal of Mathematical Sociology.   There are other agenda items that will be described in advance in an e-mail to council members in July.

Mathematical Sociology Sessions.   There are three listed sessions for mathematical sociology:

(1) A *regular session* organized by Dave Willer: #**255**, on Sunday morning, August 8th at 10:30am.   Presenters are: Barbara Meeker, John Angle, Michael Faia, and Daniel Myers. Brent Simpson will preside and the discussant is Pat Doreian.

(2) An *invited session* organized by Tom Fararo: #**489**, on Tuesday morning at 10:30am. Presenters are Peter Abell, Joe Berger, Dave Heise and Harrison White. The presider is Willie Jasso (unlisted on the preliminary program) and the discussant is John Skvoretz.

(3) An *open submission session* organized by Aage Sorenson: #**527**, on Tuesday afternoon at 2:30pm.   Presenters are Peter Hedstrom, James Montgomery, Ivar Vermeuten & Jeroen Bruggeman, and Joseph Whitmeyer.

Other Sessions of Interest to Section Members. If you check your Preliminary Program you will see that on page 166, there is a list of session numbers sorted by topic. Quite a number of these will be of interest to various members, including those listed under mathematical sociology beyond the three described above. For instance, other topics of interest to various members include rational choice, social networks, and theory.

Didactic Seminars. Three of the didactic seminars are led by section members. Advance sign-up is required. See pages 13-14 of the Preliminary Program.

> *Social Network Analysis*, Katie Faust (#1, Thurs. 9am)
> *Structural Equation Models*, Ken Bollen (#220, Sun. 8:30am)
> *Computational Sociology,* Kathleen Carley (#352, Mon.10:30 am)

Summary

ASA schedule for mathematical sociologists (enter this into your scheduler now!)

Sunday Aug 8 10:30-12:30 #255. Regular Session. Mathematical Sociology

Monday Aug 9 6:30 MathSoc Section Reception (joint with theory Section)

Tuesday Aug 10 8:30- 9:30 MathSoc Council meeting

9:30- 10:30 MathSoc Business meeting

10:30-12:30, #527. MathSoc Section Session. Modeling Social Mechanisms

2:30- 4:30, #489. MathSoc Section Session: Formal Models and Research Programs: Reflections from Experience (co-sponsored by the ASA Theory Section)

Letter to the Editor of *The Mathematical Sociologist*

John Bramsen
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May 11, 2004

In the Spring, 1999 issue of *The Mathematical Sociologist*, Tom Fararo raised some important questions about structural balance theory

and its fit – or lack of fit – with what we know about interpersonal relations among kin in one specific non-Western society: the Tikopia. "Tikopia" is the name given to an island in western Polynesia and to the people who make the island their home. The anthropologist Raymond Firth studied the Tikopia in 1928-29, learning the local language, so as not to be completely dependent on informants. He reported his study in *We, The Tikopia* (George Allen and Unwin, Ltd., 1936) and in a number of other books and articles. I never have gone back to read Firth's original work, but – probably like many sociologists who began their studies of sociology in the 1950's – I have read carefully and admiringly George Homans, *The Human Group* (Harcourt, Brace & World, Inc., 1950), in Chapters 9 and 10 of which Homans discusses Firth's work with the Tikopia, in the context of Homans' own theoretical ideas.

Recently, I have been studying the theoretical foundations of balance theory in the work of the 17th century philosopher Benedictus de Spinoza, especially in his book *Ethics: Demonstrated in Geometrical Order* (in *The Collected Works of Spinoza*, Volume I, ed. and trans. Edwin Curley, Princeton University Press, 1985). I knew from studying balance theory that Cartwright and Harary had based their work on that of Fritz Heider, and I knew from studying Heider that he had based his work on that of Spinoza, but I hadn't really studied Spinoza very closely until recently. When I did so, I found that Spinoza had proposed very specific and interesting reasons for the transitivity and transitivity-like properties of love (+) and hate (-) relationships which form the basis of the theory of structural balance. Indeed, Spinoza claims to do more than just propose; he claims to prove, as he says, "in geometrical order." You might say that he was doing mathematical sociology! This letter will only permit a brief sketch of Spinoza's reasoning. I will try to give such a sketch without doing too much violence to his ideas; for those who are interested, I have written a paper on this subject which is scheduled for one of the poster sessions of the upcoming ASA meetings in Chicago, and I would be happy to talk to you then.

As in any mathematical development, there must be careful definitions of terms; especially, there must be a careful definition of "love" and a careful definition of "hate." For these Spinoza uses his concepts of "Joy" and "Sadness":

"By *Joy*, therefore, I shall understand in what follows that *passion by which the mind passes to a greater perfection*. And by *Sadness*, that *passion by which it passes to a lesser perfection* (pp. 500-501)."

"*Love is* nothing but *Joy with the accompanying idea of an external cause*, and *Hate is* nothing but *Sadness with the accompanying idea of an external cause* (p. 502)."

The theorems that are especially relevant here are:

"Proposition 22: If we imagine someone to affect with Joy a thing we love, we shall be affected with Love toward him. If, on the other hand, we imagine him to affect the same thing with Sadness, we shall also be affected with Hate toward him (p. 506)."

"Proposition 24: If we imagine someone to affect with Joy a thing we hate, we shall be affected with Hate toward him also. On the other hand, if we imagine him to affect the same thing with Sadness, we shall be affected with love toward him (p. 507)."

X loves Y if and only if Y contributes positively to X's well being in a fundamental way, and X hates Y if and only if Y takes away from X's well being in a fundamental way. Spinoza sees love directed from X toward Y as X's response to Y's contribution to his or her well being. This suggests an economic treatment of love. Indeed, the economist Gary Becker, in his book *A Treatise on the Family* (Harvard University Press, 1981, p. 82), has suggested a similar definition of love between a man and a woman who might consider marriage to one another: "It can be said that M_i loves F_j if her welfare enters his utility function, and perhaps also if M_i values emotional and physical contact with F_j." Becker is more specific about this later in the book (p. 173), although here he uses the term "altruism" rather than "love." I will change the notation slightly to simplify things:

X <u>loves</u> Y if $U_X = U[Z_X, \psi(U_Y)]$ and $\partial U_X/\partial U_Y$ is positive, where U_X and U_Y are the utility functions of the lover and her/his beloved, and Z_X is the vector of commodities consumed by X.

Similarly then, we can define hatred as follows:

X <u>hates</u> Y if $U_X = V[Z_X, \omega(U_Y)]$ and $\partial U_X/\partial U_Y$ is negative, where U_X and U_Y are the utility functions of the hater and the hated.

Considering a triad X, Y, Z, we have:

$U_X = U[Z_X, \psi(V[Z_Y, \omega(U_Z)])]$ and so $\partial U_X/\partial U_Z = \{\partial U_X/\partial U_Y\}\{\partial U_Y/\partial U_Z\}$ and

sign $\{\partial U_X/\partial U_Z\}$ = sign $\{\partial U_X/\partial U_Y\}$ sign $\{\partial U_Y/\partial U_Z\}$,

giving an updated proof of Spinoza's Propositions 22 and 24.

Certainly, this analysis brings up questions about what constitutes love and hate – and lots of other questions as well. In this note I will just mention one thing: The analysis points us to the fact that there are other things which flow through social networks in addition to positive and negative sentiments; social support also flows through social networks. In Tikopia, name, rank, and property (especially land) flow from father to son; Tikopia society is patrilineal. Land for growing food crops is at a premium, since the island is small (about 1.5 by 3 miles, supporting about 1,200 people), and land passes usually only at the death of the father. Within the family there is normally a great deal of mutual support (for example, help with work, which Firth characterizes as hard but done without pressure), and – as Spinoza and Becker would have it – a great deal of resulting mutual affection. However, as Tom Fararo has noted, there is "restraint" in the relationship of son to father. Homans quotes Firth in this regard:

"Towards the father a mingling of affection and respect appears to be the norm, each component being a matter of social injunction as well as of individual feeling [from *We, The Tikopia*, p. 182]."

Given the importance of property ownership and the way in which it passes from father to son, such a "mingling of affection and respect" would seem to be understandable in terms of the patrilineal system. Some support for this analysis is to be found by considering the Trobriand case which Tom mentions as the mirror image of Tikopia, in that among the Trobrianders the boy relates to his father in an unrestrained way, while there is restraint in the relation between the boy and his maternal uncle. Here is a little of what Homans says about Trobriand society:

"Trobriand society is matrilineal. Descent is traced through the mother; indeed the part the father's semen plays in the conception of a child is not known. … Matriliny in the Trobriands does not mean that women have general authority over men, nor that the nuclear family – father, mother, and children – does not live together as a recognized unit. … The father plays an important part in the care and instruction of the young child, but as the latter grows up, he is expected to work under the direction of his mother's brothers in the cultivation of yams in their gardens, whence part of the crop will go as a gift to his mother. He does not continue to work under the direction of his father, as he does in Tikopia (*The Human Group*, p. 257)."

I offer these comments as a contribution to what I hope will be a lively discussion, and with thanks to Tom Fararo for starting things rolling.

John Bramsen
Retired in Chicago
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New Web Page Editor and Address.

Phil Bonacich has agreed to manage the Section's Web Page. The address is:

http://www.sscnet.ucla.edu/soc/groups/mathsoc/mathsoc.html

This Web Page can also be reached through the ASA home page, http://www.asanet.org by clicking on 'Sections'.

Past issues of Section newsletters and other items of historical and current interest to Section members are included. Many thanks to Phil for doing this.

Section Election Results

The following were elected to Mathematical Sociology Section offices in the spring 1999 elections. Congratulations to all of them. New officers begin their terms at ASA in August.

Chair-elect: John Skvoretz
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Secretary-Treasurer: Joseph Whitmeyer
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Council: Douglas D. Heckathorn
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Michael Macy
Department of Sociology
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Council, student member: Carter T. Butts
Department of Social and Decision Sciences
Carnegie-Mellon University
Pittsburgh, PA

Joint Japanese and American Mathematical Sociology Conference

Honolulu, Hawaii
June 23, 24, and 25, 2000

The Mathematical Sociology Section of the American Sociological Association and the Japanese Association for Mathematical Sociology are co-sponsoring a conference on Mathematical Sociology, June 23-25, in Honolulu Hawaii. There will be sessions on Social Networks, Rationality and Society, Group Processes, Meta-theory, Computational Social Science, and one session on other papers not included in these topics. The tentative deadline for paper submission is December 31, 1999. Until session organizers are announced, please send papers or questions to one of the two co-organizers.

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For the Record: Section Officers and Committees for 1998-99.

Efforts of elected and appointed officers and committee members are essential to the success of our Section. In this final issue of the 1998-99 year, I want to acknowledge and thank them. (If I've missed anyone, please let me know).

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Tom Fararo (chair)
Phil Bonacich
Kathleen Carley
John Skvoretz
Dave Willer

Section program organizers for ASA 1999
1) **Invited session**: Formal Models and Research Programs: Reflections from Experience."
Tom Fararo, Organizer
2) **Open submission session**: "Modelling Social Mechanisms"
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It is **very important** to our section that we maintain and increase membership. Please renew your own membership and encourage your colleagues and students to join.

Application for Membership in the ASA Mathematical Sociology Section

Name:

Address:

_____ I am an ASA member and want to join the Mathematical
Sociology Section. Enclosed is a check for $10.00 for section dues
($5.00 for students; however, while funds last, a generous gift from a section member makes membership free for graduate students). Make checks payable to the American Sociological Association.

_____ I am not an ASA member but am interested in joining the Mathematical Sociology Section.

Please send me information about joining ASA.

 Send to:
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