# The Mathematical Sociologist

**Newsletter of the Mathematical Sociology
Section of the American Sociological Association
Spring 2003**

## Section Officers

*Chair*
Noah E. Friedkin,
University of California, Santa Barbara
friedkin@soc.ucsb.edu
*Chair Elect*:
David Heise, Indiana University
heise@indiana.edu
*Past Chair, and: Section Nominations
Committee Chair*
Patrick Doreian, University of Pittsburgh
pitpat@pitt.edu
*Secretary/Treasurer – 2005*
Lisa Troyer, University of Iowa
lisa-troyer@uiowa.edu

*Council 2003*
Kenneth C. Land, Duke University
kland@soc.duke.edu

Jane Sell, Texas A&M University
j-sell@tamu.edu

*Council - 2004*
Diane H. Felmlee,
University of California-Davis
dhfelmlee@ucdavis.edu

Murray Webster, Jr.
University of North Carolina, Charlotte
mwebster@carolina.rr.com

*Council 2005*
Bob Hanneman
University of California, Riverside
hanneman@ucr.edu

Noah P. Mark
Stanford University
nmark@leland.stanford.edu

*Student Representative*
Jun Kobayashi
University of Chicago
kobayash.jun@nifty.com

## From the newsletter editor

Barbara Meeker, bmeeker@socy.umd.edu

The MathSoc Section Newsletter is back by popular demand (sort of). After a gap of about two years, I volunteered once again to produce the newsletter. Given the many very competitive professional accomplishments we all try for, it was something of a relief to campaign for a job absolutely no one else wants! I intend to do either one or two issues a year. This is the issue for 2002-2003, covering approximately April 2002 through April 2003. Dave McFarland (UCLA -   MCFARLAND@SOC.UCLA.EDU) has agreed to post newsletters and other information on a Section web page.

The Section has been very active, as shown in the minutes of the Business Meeting, prepared by 2002 Secretary-Treasurer Joe Whitmeyer, (see below).  Other activities of the Section during the past year and some with ASA coming up are also described below.

Section Chair Noah Friedkin has written an interesting comment on the Current State of Mathematical Sociology; I think most of us would agree wholeheartedly with his remarks.  It is interesting to me that I had also received a thoughtful letter from Tom Fararo (one of the Section founders, and a former Section Chair) suggesting an editorial on similar lines but with a different perspective. He wonders if Mathematical Sociology has 'Disappeared'; for example, in the new edition of *The International Encyclopedia of the Behavioral and Social Sciences*, published by Elsevier, there is neither an entry for "mathematical sociology," nor for "mathematical models in sociology." (There is however an entry for "mathematical sociology" in the newest  *Encyclopedia of Sociology*, edited by E. F. Borgatta and R. J. V. Montgomery, MacMillan, 2000).  The fact that mathematical sociology requires both mathematical expertise and thorough knowledge of a substantive area, along with the existence of disciplinary disagreements about what constitutes 'theory' make it difficult to place our work so that others are aware of it. If I make a contribution to the study of discussion groups using a formal theory translated into a mathematical model, do I send it to a journal or conference on group processes, on

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mathematical sociology, or on sociological theory (or even possibly on mathematical biology, since many of the models are similar)?

It seems to me that one use of this newsletter can be to communicate to each other what we are doing. I have included the programs of several conferences, a table of contents of the *Journal of Mathematical Sociology*, and several other references to recent publications that use mathematical models to address substantive issues. I would encourage all Section members to send me references to their own papers, and also to Web pages if you have them.

I also encourage you to send comments on these (or other) issues of general concern to the Section.

And, of course, we need more members; please renew your membership, and encourage colleagues and students to join. There are instructions for joining at the end of the newsletter. □

## Comments From the Section Chair
Noah Friedkin

*The Current State of Mathematical Sociology*
This is an exciting period for mathematical sociology. Physicists have become interested in social network phenomena. Business schools are hiring sociologists to develop formal models applicable to economic phenomena. National security concerns have drawn mathematical sociologists into the war on terrorism. Devastating epidemics have brought the recognition that the simplifying assumptions of classic contagion models must be refined by attending to the social structure in which contagion occurs. The globalization of economic and political organizations calls for the development of formal models of extremely large social systems. Rapid advances are being made in the formalization of social processes in various fields of sociology, including social exchange, interpersonal influence, emotion, rational choice, social organization, collective behavior, social movements, and culture.

Never before has there been a more pressing demand for sociologists who combine strong mathematical skills with deep substantive grounding in particular fields. Mathematical models of sociological phenomena are unlikely to make an enduring contribution if they are not informed by the refined substantive sensibility that usually comes from systematic reading in sociology and intense involvement with data. There are not enough of us. Somehow we need to attract more mathematically-oriented undergraduates into the graduate training programs of sociology, and we need to build vibrant graduate programs in mathematical sociology that are aimed at training a new generation of theorists who work in particular substantive fields of sociology.

We should react strongly to attempts to label us as "methodologists" whose work does not bear centrally on sociological theory or as "narrow" because the mathematical models that we employ are not readily accessible to many sociologists. I have found many of the non-mathematical theories that are currently prominent in sociology entirely impenetrable. After years of picking up and laying down theory books and listening to, but not understanding, conference presentations in theory sessions, I've come to accept the idea that the progress of science in sociology cannot be taken for granted, that it will not advance by itself, and that we must actively promote it not only through our publications, but also through organizational efforts to build programs within our academic departments for graduate students who are committed, as we are, to a vision of an edifice of sociological theory that is built on mathematical foundations. We cannot wait for the discipline to embrace our endeavors. We must "do our thing" against resistance if need be, because it is important and worth doing well. □

## Plan Ahead for Atlanta
ASA will meet in Atlanta, August 16 to 19, 2003. Mathematical sociology Section day is *Saturday, August 16*. The reception will be 6:30-8:15 p.m. on that day. We have been allocated one paper session, according to the current ASA formula for Section sessions (this is because we have 300 or fewer members). □
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## Please Vote!
The slate of officers for the MathSoc Section for 2003 is:
*For Chair-Elect*
    Kenneth C. Land
    Kazuo Yamaguchi
*For Council Member*
    William Shelly
    James Montgomery
    James Moody
*For Council, Student Member*
    Kayo Fujimoto
    Ju-Sing Lee

You can find biographical information about them on the ASA Web page www.asanet.org. (You need to have information from your paper ballot from ASA to enter this page.) Thanks to all of the candidates for their willingness to run, and congratulations on being recognized as valuable Section members. Votes must be in by *May 30.*□

## Section Committees for 2003

*Outstanding Book and Article Publication Award*:

|  |  |
|---|---|
| Chair: | Jane Sell |
|  | Dave Heise |
|  | Bob Hanneman |
|  | Jun Kobayashi |
|  | A Non-Council Member |

(Selected by Jane Sell)

*Graduate Student Paper Award*:

|  |  |
|---|---|
| Chair: | Ken Land |
|  | Noah Mark |
|  | Murray Webster |
|  | Diane Felmlee |
|  | A Non-Council Member |

(Selected by Ken Land)

*Nominations Committee*

|  |  |
|---|---|
| Chair: | Pat Doreian |
| Members: | All Council Members |

*Program Committee*

|  |  |
|---|---|
| Chair: | Noah Friedkin |
| Members: | All Council Members □ |

## Minutes of the 2002 Business Meeting of the Mathematical Sociology Section

Joseph Whitmeyer, Section Secretary-Treasurer

The business meeting of the mathematical sociology section of the American Sociological Association was held Saturday, August 19, 2002 from 11:30 to 12:20 in the Hilton Washington. The meeting was presided over by section chair Patrick Doreian. Twenty-nine section members were present. (This makes a quorem by ASA rules).

1. Election results

The chair presented results of the elections. David Heise is the chair-elect.

2. Section awards.

The first ever career award was made to Harrison White (in absentia) at the reception the previous evening (8/18/02). Andrew Noymer received the open paper prize as well as the graduate student prize. It was agreed that the career should be named, perhaps with a combination of names. Possible names raised were Coleman, White, Fararo, and Kemeny. It was agreed that the incoming chair, Noah Friedkin, will collect suggested names emailed to him and will email people asking for suggestions. The section then will vote on the name by email.

3. Second and third joint Japan-U.S. Mathematical Sociology conferences.
Gene Johnsen reported on the second joint conference between the section and the Japanese Association for Mathematical Sociology. It was held in Vancouver in June, 2002, and was attended by 33 participants plus spouses. It was a "very positive experience for the participants." Financially, the conference at least broke even. Financial management was greatly facilitated by Phoebe Stevenson of the ASA who arranged a special funds account under the section. The section council also had given a guarantee for up to $500 for costs. Organizers of the conference were Gene Johnsen and Noah Friedkin on the U.S. side, and Yoshinori Sato and Yuriko Saito on the Japanese side.

Planning for the third joint conference is well under way. This one will be held in Sapporo, Hokkaido, Japan in July, 2004. The Japanese co-organizer is Toshio Yamagishi, professor at Hokkaido University. American co-organizers are needed within a month. Herm Smith and Phil Bonacich (neither present) were suggested as good possibilities; Noah Friedkin said he would contact them. Gene Johnsen said Murray Webster (not present) had said he would be swilling to assist in preparation of an NSF proposal for supporting graduate student attendance, as had been obtained for the first conference in Hawaii. Geoff Tootell noted there might be a conflict with the Krakow group process conference, scheduled for early July, 2004.

Patrick Doreian, also editor of JMS, discussed how JMS could treat papers for the joint conferences. They could form one or more special issues or they could simply appear in the journal. The Hawaii Mathematical Sociology conference papers have just been published. While they did not appear as special issues as such, they did comprise two full issues with acknowledgments to the conference and conference organizers.

4. Website and Newsletter.

Patrick Doreian reported that in the council meeting Noah Friedkin, the incoming chair, had volunteered to helped coordinate the website (but he did not want to be call "webmaster"). Barbara Meeker volunteered to be the new newsletter editor, for one or two issues. Concerning the website, a motion was passed that Barbara Meeker and Dave McFarland should check out the ASA section website to decide whether to post the newsletter there and otherwise use that website for the section, or simply to link from that website to the actual section website elsewhere.

5. Section membership issues.

Geoffrey Tootell suggested that we and Rationality and Society members cross-register, since the overlap is only about 70 members. He said the incoming chair of that section, Lindenberg, is not that favorable to the idea, but the chair-elect, Scott Feld, probably would be more receptive. Gene Johnsen suggested using joint receptions--with perhaps Rationality and Society, Theory, or Methodology--to recruit new members. There was general agreement that the much cheaper subscription rate for section members for the Journal of Mathematical Sociology should be strongly emphasized in recruitment. The rate is $63 for section members compared to an individual membership of over $300 otherwise. Patrick Doreian said he would suggest that Taylor and Francis, the publisher, take out an ad in Footnotes giving the discount rates for section members.

6. Journal of Mathematical Sociology

Patrick Doreian, the editor, noted that there is no possibility of the journal affiliating officially with the section. However, the new publishers, Taylor and Francis, are very good. They are responsive by providing feedback and support. They are willing to go to conferences[1]. They will not lower their institutional rate for libraries; however, it may be possible to persuade them to add JMS for a smaller rate at libraries they already provide with journals. Also, libraries may be willing to add JMS now that it is no longer a Gordon and Breach publication. Many libraries had refused to deal with Gordon and Breach.

7. Budget.

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[1] They came to this year's conference and a managing editor attended both the section's reception and the business meeting.

The section ended May, 2002 with $1,932. About $300 was disbursed for the reception. This left about $1600.

8. Other conferences.

David Willer noted that the Rationality and Society section would be holding a mini-conference the following year. Those interested should contact the Siegwart Lindenberg. Also the University of South Carolina together with Emory was organizing the 2003 group processes conference. Those interested should contact him. There is also a possibility that the Math Sociology section could co-sponsor either of those conferences.

9. New chair.

Noah Friedkin became the new chair. □

## An additional Note on Planning for the Next Joint Japan-North America Conference on Mathematical Sociology

The dates are *June 26 (Sat) -28 (Mon), 2004 in Sapporo, Japan.* However, the status of this conference is currently being debated by the organizers in light of the SARS epidemic. They will let the section know as soon as possible about whether the conference will be held as scheduled. □

## The Second Joint Japan-North America Conference on Mathematical Sociology

One of the special activities of the Section in 2002 was this conference, which was held in the beautiful city of Vancouver, BC. It was sponsored by the Mathematical Sociology section of the American Sociological Association and the Japanese Association for Mathematical Sociology and took place May 31- June 2, 2002 at the Coast Plaza Suite Hotel at Stanley Park Vancouver, BC, Canada.

Conference Co-organizers:
Eugene Johnsen, University of California Santa Barbara USA
Noah Friedkin, University of California, Santa Barbara USA
Yuriko Saito, Nara Women's University, Japan
Yoshimichi Sato, Tohoku University, Japan
*The conference organizers expressed their thanks and appreciation to Phoebe Stevenson, Deputy*

**Program**

Session I: Network Analysis I – Social Influence Networks (Chair: Noah E. Friedkin)

1. Influence Networks in School Board Policy Groups: An Analysis of Resource Allocation Preferences, *Noah E. Friedkin*, University of California.
2. A Social Choice Approach to the Problem of Order: Evolution of Social Influence Networks in Opinion Aggregation, *Jun Kobayashi*, University of Chicago, ICS, Utrecht University.
3. Social Excitement and Social Influence Network Theory, *James F. Hollander*, Texas Instruments Incorporated.

Session II: Analysis of Power (Chair: Scott Feld)

1. Making Weighted Voting Rules Work: Using a Market Approach to Voting Power, *Scott L. Feld and Bernard Grofman*, Louisiana State University.
2. Independency of Political Power from Legitimacy: An analysis with incomplete information games, *Naoki Sudo*, Gakushuin University.
3. Power in Non-negotiated Exchange Networks, *Phillip Bonacich*, University of California.

Session III: Family and Population (Chair: To be announced)

1. Level and Pattern of Infant and Child Mortality in the Indian Subcontinent, *Surendar Yadava*, University of Northern Iowa.
2. Women's Status, Age at Menopause, and Family Health in India, *Surendar Yadava*, University of Northern Iowa.
3. Two Patterns of Wife Influence on Farm Innovation in a Midwestern Dairy State, *Martha Ross DeWitt*, Medical College of Wisconsin.

Session IV: Inequality and Justice (Chair: Yuriko Saito)

1. Justice, Status, and Social Distance, *Guillermina Jasso*, New York University.
2. Effect of Inequality on Trust: An Agent-based Model of Mutual Trust, *Yoshimichi Sato*, Tohoku University.

Session V: Rationality and Society (Chair: Masaki Tomochi)

1. A Consumer-Based Model of Competitive Diffusion of Two Goods: The Effects of Network Externalities and Local Interactions, *Masaki Tomochi[*] and Mitsuo Kono[**]*, [*]University of California and [**]Chuo University.
2. Evolution Model of Agriculture Strategy: Dilemma Avoidance by Non-Random Model, *Hirokuni Oura*, Teikyo University.
3. Realizing Cooperation through Slightly Altruistic Individuals: An Evolutionary Game Theoretical Approach, *Masayoshi Muto*, the Graduate School of Tokyo Institute of Technology.

Session VI: New Approaches to Classical Sociological Theories (Chair: Yoshimichi Sato)

1. On the Complementarity of Expectations: Coupling Parsons with Balance Theory, *Kazuto Misumi,* Kyushu University.
2. Symmetry of Positive and Negative Sentiments: A Nasty Corollary to the Rotten Kid Theorem, *John Bramsen*.
3. A Micro-Macro Linkage from Protestantism to Capitalism in Weber's Argument: Solving Social Dilemmas by Value-Rational Preference, *Tatsuhiro Shichijo[*] and Jun Kobayashi[**]*, [*]Osaka Prefecture University and [**]University of Chicago, ICS, Utrecht University.

Session VII: Group Processes (Chair: Barbara F. Meeker)

1. Some Non-linear Dynamics of Group Dynamics, *Barbara F. Meeker*, University of Maryland.
2. Steps to Extend the Range of Status Characteristics Theory to Cover Large Collectivities and Imperfectly Shared Information, *Geoffrey Tootell[*], Alison Bianchi[**] and Paul T. Munroe[***]*, [*]San Jose State University, [**]University of Notre Dame and [***]Towson University.
3. Which is adaptive, self-enhancement or self-effacement? : A mathematical model of self-presentation, *Motoko Harihara[*] and Ryuhei Tsuji[**]*, [*,**]The University of Tokyo.

Session VIII: Network Analysis II – Applied Methodology (Chair: Yoosik Youm)

1. Sexual Market and its Effects on Marriage Market in US: A Game Theoretic Approach with Network Embeddedness, *Yoosik Youm*, University of Illinois at Chicago.
2. Estimating Acquaintanceship Volume in Japan and US, *Ryuhei Tsuji*, The University of Tokyo.

Session IX: Organizational Analysis (Chair: Jar-Der Luo)

1. How Small Groups Form in an Organization? *Luo, Jar-Der[*] and Wang, Shu-Sen[**]*, [*]Graduate School of Social Informatics and [**]Yuan-Ze University.

2. Applying Mathematical Sociology in Institutional Research in Higher Education: Population Multivariate Processes in a Structured Environment, *Gordon J. Burt*, Open University.
3. Forgotten Rules: The Duration Dependence of Organizational Rule Revisions and Suspensions, *Martin Schulz*, University of British Columbia.

Session X: Inequality and Education (Chair: John Angle)
1. A Theory of the Gamma Snap and its Symmetrically Reversed Dynamic in the Right Tail of the U.S. Nonmetro Distribution of Wage and Salary Income, *John Angle*.
2. Why Class Differential in Educational Attainment hasn't been changed? : A Rational Choice Approach, *Hiroshi Tarohmaru*, Kyoto Koka Women's University. □

# Mathematical Sociology Presentations at ASA 2002.

The Mathematical Sociology Section sponsored two paper sessions at ASA in Chicago, August 2002. And, also at ASA, there was one regular paper session on Mathematical Sociology.

**Section Session I: Mathematical Models of Dynamical Social Systems**
Organizer and Presider: Patrick Doreian, University Of Pittsburgh

Predicting Network Emergence in Dynamic Exchange Networks. Casey Adam Borch, Charles Dudley Girard and David Willer, University Of South Carolina

Creating the Thin Blue Line: Evolution of Social Networks in a Police Academy. Norman Conti, University Of West Virginia; Patrick Doreian, University Of Pittsburgh

On The Relationship between Population Ecology and the Economic Theory of Industrial Organization. Fabio G. Rojas, University Of Chicago

Structural Change and Homeostasis in Organizations: A Decision Theoretic Approach. Carter T. Butts, University of California, Irvine; Kathleen M. Carley, Carnegie Mellon University

**Section Session II: Mathematical Models of Social Network Structure/Process**
Organizer and Presider: Noah E. Friedkin, University Of California, Santa Barbara

A Note On Structural Holes Theory And Niche Overlap, Jeroen Bruggeman, Gianluca Carnabuci, and Ivar Vermeulen, University Of Amsterdam, The Netherlands

Taking Turns and Talking Ties: Network Structure and Conversational Sequences. David R. Gibson, Harvard University

Evolution of Social Influence Networks in Opinion Aggregation: A Social Choice Approach to the Problem of Order. Jun Kobayashi, University Of Chicago

Latent Space Approaches to Social Network Analysis. Adrian Reftery, University Of Washington

Discussion: Eugene C. Johnsen, University of California, Santa Barbara

**Regular Paper Session: Mathematical Sociology Theory**
Organizer: Scott L. Feld, Louisiana State University
Presider: Carter T. Butts, University of California, Irvine

Reward Expectations and Allocative Behaviors: A Mathematical Model. M. Hamit Fisek, Bogazici University (Turkey) David Wagner, State University of New York, Albany

Mapping the Exact Relations between Inequality and Justice. Guillermina Jasso, New York University

Social Order in Large Networks: An Application of Watts' Small World Simulation. Ryuhei Tsuji, University of Tokyo (Japan)

Discussion: Carter T. Butts, University of California, Irvine □

## Announcements

Kathleen Carley, Carnegie Mellon University
kathleen.carley@cmu.edu  announces the
following Section related activities

CASOS summer institute in computational and
network analysis:  June 16-21, see
www.casos.ece.cmu.edu for more information.

NAACSOS conference in computational social
and organizational science:  June 22-25, see
www.casos.ece.cmu.edu for more information. □

## Recent Publications in Mathematical Sociology

**Journal of Mathematical Sociology**
(part II of papers from the first Japan-North
American Conference on Mathematical
Sociology, June 2000)

Trust, Assurance, and Inequality: A Rational
Choice Model of Mutual Trust Yoshimichi Sato
Pp. 1 - 16

Interpersonal Influence and Attitude Change
toward Conformity in Small Groups: A Social
Psychological Model Ryuhei Tsuji   Pp. 17 - 34

 A Non-Stationary Stochastic Process Model of
Completed Marital Fertility in Japan Shuuichirou
Ike  Pp. 35 - 55

Properties of Learning Models in Collective
Action: Rationality of Backward-Looking
Players Tatsuhiro Shichijo, Yasuto Nakano Pp.
57 - 69

The Dynamics of Japanese and American
Interpersonal Events: Behavioral Settings versus
Personality Traits Herman W. Smith Pp. 71 - 92

System Catastrophe: A Distributive Model for
Collective Phenomenon Fu Chang, Jar-Der Luo
Pp. 93 - 109

A Boolean Model of Role Discrimination Kazuto
Misumi Pp 111 - 121

Some Algebraic Structures for Diffusion in
Social Networks John Levi Martin Pp. 123 - 146

A Deductive Approach to Friendship Networks
Joseph M Whitmeyer. Pp. 147 - 165

The Nonlinear and Scaled Growth of the
Ottoman and Roman Empires Güngör Gündüz
Pp. 167 - 187

The Rational Weakness of Strong Ties: Failure
of Group Solidarity in a Highly Cohesive Group
of Rational Agents Andreas Flache Pp. 189 - 216

The Statistical Signature of Pervasive
Competition on Wage and Salary Incomes John
Angle Pp. 217 - 270

The Emergence of Deontological Codes in
Public Administration Angelo Antoci, Pier Luigi
Sacco Pp. 271 - 307

Further Algebraic Results in the Theory of
Balance John Bramsen   Pp. 309 - 319

Nonlinear Continuous-Discrete Filtering Using
Kernel Density Estimates and Functional
Integrals Hermann Singer Pp. 1 - 28

A Differential Equation Model for Predicting
Public Opinions and Behaviors from Persuasive
Information: Application to the Index of
Consumer Sentiment David P. Fan, R. Dennis
Cook Pp. 29 - 51

Historical Evolution and Mathematical Models:
A Sociocultural Algorithm Jürgen Klüver, Jörn
Schmidt Pp. 53 - 83 □

### Other Mathematical Sociology Publications

Michael Faia, at College of William and
Mary, sent the following references (thanks,
Michael).  I urge other Section members to let
the Newsletter know when and where they have
MathSoc publications.

" 'Three Can Keep A Secret if Two Are
Dead' (Lavigne, 1996): Weak Ties As
Infiltration Routes. Michael A. Faia, *Quality
&Quantity* 34:193-216, 2000

"Differential Equation Modeling as a
Source of Theoretical Insight: Four Disparate
Examples" Michael A. Faia*, Quality & Quantity*,
36:169-195, 2002

Also, mathematical sociologists will be
interested in many of the chapters in two recent
books:

*The Growth of Social Knowledge: Theory, Simulation, and Empirical Research in Group Processes* Edited by Jacek Szmatka, Michael Lovaglia, and Kinga Wysienska. Westport, Conn.: Praeger, 2002.

*New Directions in Contemporary Sociological Theory,* Edited by Joseph Berger and Morris Zelditch, Jr. Lanham, MD, Rowman & Littlefield, 2002. □

Please encourage your colleagues and students to join the Mathematical Sociology Section.
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To join the Section, you must be a member of ASA. Print this application, fill it out, and send to ASA.  Or, see the ASA Section membership web page;
http://www.asanet.org/forms/sectionform.html     (we are Section # 37)

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). Make checks payable to the American Sociological Association.

_____ I am not an ASA member but am interested in joining the Section. Please send me information about joining ASA.


Mail to:
American Sociological Association
1307 New York Avenue, NW
Suite 700
Washington, DC 20005