BIOGRAPHICAL SKETCH

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NAME: Hovmand, Peter

eRA COMMONS USER NAME (credential, e.g., agency login): phovmand

POSITION TITLE: Professor, Case Western Reserve University, pending start date 7/2020

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Bucknell University, Lewisburg, PA	ABEE	05/1991	Electrical Engineering & Mathematics
Michigan State University, East Lansing, MI	M.S.W.	06/1997	Social Work
Michigan State University, East Lansing, MI	Ph.D.	06/2003	Social Work & Psychology

A. Personal Statement

As the Founding Director of the Social System Design Lab and Professor of Practice at the Brown School of Social Work, Washington University in St. Louis, I lead a team that develops system dynamics models and computer simulations with an emphasis on participatory systems modeling in organizations and community settings, organizational dynamics of human service delivery systems, and social determinants of health. I have extensive experience leading/training research teams in the design and facilitation of participatory group model building exercises, as well as building system dynamics computer simulation models with additional experience in comparative modeling building and testing for strong and weak equivalence in individual, agent-based and structural equation statistical models.

The focus of my research is on structural violence, dynamic capabilities of human service delivery systems, and participatory methods for system dynamics computer modeling and simulation. Application areas have covered a wide variety of disciplines and contexts, including both domestic and international, urban and rural, and work involving diverse participants through the use of group model building/community-based system dynamics. My work has been funded by the National Science Foundation, National Institutes of Health, Centers for Disease Control and Prevention, and Substance Abuse and Mental Health Services Administration. Through this work over the last 10 years and leadership of the Social System Design Lab, I have developed an international reputation in systems science, specifically, participatory systems modeling and system dynamics computer modeling and simulation.

Relevant to this application is prior work on developing system dynamics simulation models of cancer screening computer simulation models (e.g., colorectal cancer, breast cancer, non-Hodgins lymphoma) to develop strategies for prevention and reducing disparities. On this project, I will work with Dr. Johnie Rose in leading the development of a multilevel agent-based simulation modeling, analysis; participating on virtual team meetings; and, supporting the preparation of manuscripts and presentations for scientific conferences and publications.

B. Positions and Honors

Positions and Employment

1998-2003 Instructor, Michigan State University, East Lansing, MI

2003-2009	Assistant Professor, George Warren Brown School of Social Work, Washington University, St. Louis, MO
2007-2009	Assistant Professor, Women and Gender Studies, Washington University, St. Louis, MO
2009-present	Founding Director, Social System Design Lab, George Warren Brown School of Social Work, Washington University, St. Louis, MO
2013-2017	Associate Professor of Practice, Brown School, Washington University, St. Louis, MO
2017-present	Professor of Practice, Brown School, Washington University, St. Louis, MO
2020 -	Pending Appointment, Professor of Health Management, Center for Community Health Integration, Mandel School of Applied Social Sciences, School of Engineering, Case Western Reserve University

Other Experience and Professional Memberships

1997-present	Member, System Dynamics Society
1997-present	Member, Institute of Electrical and Electronics Engineers
2003-present	System Dynamics Society, Co-founder and Chair of the Diversity Committee
2003-present	Member, Society for Social Work Research
2012-present	Member, Society for Community Research and Action
2016-present	Member, Association for Computing Machinery
2013-2016	Vice President of Marketing and Communications, System Dynamics Society
2016-2018	Commissioner, Lancet Commission on Obesity
2019	Conference Program Chair, International Conference of the System Dynamics Society

Awards

2019 Audre Lorde Academic Exploration Award, Washington University in St. Louis Holobaugh Honorees
2019 Exemplary Educational Partner Awardees, Jennings School District, St. Louis
2018 Excellence Award for MSW Advising, Brown School, Washington University in St. Louis
2015 Excellent in Mentoring from the Graduate Student Senate of the College of Arts & Sciences
2009 Excellence in Teaching Award, Brown School, Washington University in St. Louis

C. Contribution to Science

1. Led the creation of Scriptapedia (2009-present), a documented set of "scripted" group model building exercises as a way to increase the rigor of participatory group model building methods and be able to distinguish specific from non-specific treatment effects and replicate participatory group model building exercises across diverse communities. Prior to this contribution, participatory group model building exercises were undocumented, variable in their implementation, required high levels of system dynamics expertise, and thus not scalable. By developing Scriptapedia, we have been able to standardize group model building workshops and facilitate the growth in the use of group model building in diverse communities across the United States and internationally.
    a. **Hovmand, P.S.,** Andersen, D.F., Rouwette, E., Richardson, G. P., Rux, K., & Calhoun, A. (2012). Group model building "scripts" as a collaborative tool. *Systems Research and Behavioral Science, 29*, 179-193.
    b. Brennan, L. K., Sabounchi, N. S., Kemner, A. L., & **Hovmand, P. S.** (2015). Systems thinking in 49 communities related to healthy eating, active living, and childhood obesity. *Journal of Public Health Management and Practice, 21*, s55-s69. PMID 25828223.
    c. Allender, S., Millar, L, **Hovmand P.S.**, Bell, C, Moodie, M., Carter, R., Swinburn, B., Strugnell, C., Lowe, J., de la Haye, K., Orellana, L., & Morgan, S. (2016). Whole of Systems Trial of Prevention Strategies for Childhood Obesity: WHO STOPS Childhood Obesity. *International Journal of Environmental Research and Public Health*. 2016 Nov 16;13(11), E1143. PMID: 27854354
    d. Trani, J F., Ballard, E., Bakhshi, P., & **Hovmand, P.S.** (2016). Community based system dynamic as an approach for understanding and acting on messy problems: a case study for global mental health intervention in Afghanistan. *Conflict and Health,* 2;10:25. eCollection. PMID: 27822297.

2. Pioneered the use of system dynamics computer modeling and simulations in community-based settings as community-based system dynamics (CBSD) from 2008 to 2015. Prior to this work, system dynamics computer modeling and simulation was largely engaged only trained professionals (e.g., researchers, government leaders, management). This work extended the use of system dynamics modeling into

community settings with diverse stakeholders and provided the first look at how marginalized communities saw social determinants of health from a systems perspective.

a. **Hovmand, P.S.** (2014). *Community Based System Dynamics*. Springer
b. Homa, H. Rose, J., **Hovmand, P.S**., Cherng, S.T., Riolo, R.L., Kraus, A., Biswas, A., Burgess, K., Aungst, H., Stange, K. (2015). A participatory model of the paradox of primary care. *Annals of Family Medicine, 13*, 456-465. PMCID: PMC4569454
c. Hoehner, C. M., Sabounchi, N. S., Brennan, L. K., **Hovmand, P. S.**, & Kemner, A. (2015). Behavior over time graphs: assessing perceived trends in healthy eating and active living environments and behaviors across 49 communities. *Journal of Public Health Management and Practice, 21*, s45-s54. PMID: 25828222.

3. Led and collaborated in pioneering approaches to design innovative community prevention frameworks for identifying and eliminating disparities (2009-present). This effort looked for innovative approaches to map and develop community prevention frameworks including the design of community based social marketing prevention strategies and "long tailed" approaches to eliminating disparities.
    a. Sabounchi, N. S., **Hovmand, P. S.,** Osgood, N. D., Dyck, R. F. , & Jungheim, E. S. (2014). A systems approach to modeling weight gain and obesity in reproductive age women. *American Journal of Public Health,* 104(7), 1240-1246. PMID: 24832413
    b. Kreuter, M. W., **Hovmand, P. S.**, Pfeiffer, D. J., Fairchild, M., Rath, S. Golla, B., & Casey, C. (2014). The "Long Tail" and public health: New thinking for addressing health disparities. *American Journal of Public Health.* e1-e8. PMID: 25322308.
    c. Biroscak, B.J., Schneider, T., Panzera, A.D., Bryant, C., McDermott, R.J., Mayer, A.B., Khaliq, M., Lindenberger, J., Courtney, A.H., Swanson, M.A., Wright, A.P., **Hovmand, P.S.** (2014). Applying systems science to evaluate a community-based social marketing innovation: a case study. *Social Marketing Quarterly, 20*(4), 247-267.
    d. Munar, W., **Hovmand, P.S.**, Flemming, C., & Darmstadt, G.L. (2015). Scaling-up impact in perinatology through systems science: Bridging the collaboration and translational divides in cross-disciplinary research and public policy. *Seminars in Perinatology, 39*(5), 416-423. PMID: 26184341.

4. Led transdisciplinary approaches to advancing the design of innovative implementation strategies using system dynamics computer modeling and simulation models (2005-2014) with applications to coordinated community response in domestic violence, implementation of evidence-based practices in mental health service organizations, and most recently "long-tailed" approaches to reducing health disparities. This work addresses the specific problem that implementation strategies may be sensitive to risk and uncertainties in system structures that can lead to unintended consequences, especially in complex community interventions.
    a. **Hovmand, P.S.,** & Ford, D.N. (2009). Computer simulation of implementation strategies. In Rossetti, M.D., Hill, R. R., Johansson, B., Dunkin, A., and Ingalls, R.G. (Eds.), *Proceedings of 2009 Winter Simulation Conference*,3088-3098.
    b. **Hovmand, P.S.,** & Ford, D.N. (2009). Sequence and timing of three community interventions to domestic violence. *American Journal of Community Psychology, 44*(3-4), 261-272.
    c. **Hovmand, P.S**., Ford, D.N., Flom, I., & Kyriakakis, S. (2009). Victims arrested for domestic violence: unintended consequences of arrest policies. *System Dynamics Review*, 25(3), 161-181.
    d. **Hovmand, P.S**., & Gillespie, D.F. (2010). Implementation of evidence based practice and organizational performance. *Journal of Behavioral Health Services & Research 37*(1), 79-94.

5. Developed and tested formal weak and strong definitions of mathematical equivalence between different computer and statistical modeling approaches including system dynamics feedback models, structural equation models, social and geographical networks, and individual/agent based models for identifying latent causal models underlying numerical longitudinal and time series data.
    a. Hovmand, P. S. (2003). Analyzing dynamic systems: A comparison of structural equation modeling and system dynamics modeling. In B. H. Pugesek, A. Tomer, & A. v. Eye (Eds.), *Structural equation modeling: Applications in ecological and evolutionary biology* (pp. 212-234). New York: Cambridge University Press.

b. Hovmand, P. S., & Pitner, R. (2005). *Combining system dynamics, social networks, and geographic information systems.* Paper presented at the 23rd International Conference of the System Dynamics Society, Boston, MA.
c. Hovmand, P. S., Jonson-Reid, M., & Drake, B. (2006). *Cycling in child welfare service pathways*. Paper presented at the Society for Social Work Research, San Antonio, TX.
d. Hovmand, P. S., & Chalise, N. (2015). Simultaneous Linear Estimation Using Structural Equation Modeling. In H. Rahmandad, R. Oliva, & N. D. Osgood (Eds.), *Analytical Methods for Dynamic Modelers* (pp. 71-94). Cambridge, MA: The MIT Press.

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

Research Grant (Hovmand, PI) 2019-2020
National Institutes of Health Clean Cookstove Implementation Science Network
Real Options Strategies for Achieving Scale (ROSAS)
Pilot study to extend the household-community level system dynamics simulation model of exclusive and sustained use of clean cooking fuels to develop real option strategies for achieving scale in collaboration with Dr. Gautam Yadama (Boston College), Dr. Byron Powell (Wash U), and Pratiti Priyadarshini (Foundation for Ecological Security, India).
Role: PI

Service Contract (Hovmand, PI) 2018-2019
SkipNV
Program Evaluation and Development of Service Coordination to Improve Educational Outcomes
A developmental evaluation using system dynamics for two human service organizations providing social supports to public school systems.
Role: PI

Economic and Social Research Council, UK (Trani, PI) 2018-2022
Raising Learning Outcomes in Education Systems
Study focuses on applying and evaluating community-based system dynamics with school improvement communities in Pakistan and Afghanistan in a randomized controlled trial.
Role: Co-PI

Completed Research Support

R01 Subcontract AH000485 (Economos, PI) 2013-2018
Harvard University (Prime is NIH)
Systems Science to Guide Whole-of-Community Childhood Obesity Interventions
The overall goal of this project is to compare interventions in two contexts (Somerville, MA and Victoria, Australia) using participatory group model building methods and agent based modeling. This project involves the design, training, and evaluation of participatory group model building sessions at the two study sites and extending group model building methods from system dynamics to agent based modeling.
Role: Investigator

Subcontract (Baldwin, PI) 2014-2017
University of Southern Florida (Prime is CDC)
Community Based Prevention Marketing (CBPM) for Systems Change to Address Cancer Health Disparities
The project involves providing skillful workshop design and facilitation in group model building workshops, as well as system dynamics model development expertise, through the further development of existing cancer-related simulation models. Work includes working collaboratively with representatives from University of South Florida (USF) and to-be developed Florida community coalition stakeholders to design and implement scripted group exercises to understand the dynamics of colorectal cancer screening disparities in a selected priority population.
Role: Co-Investigator