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Many Differences **One Destiny**

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**Bibliographical Guide to  
Structural Racialization, Implicit  
Bias, and Systems Thinking**

By Charles Patton

## Structural Racialization

Alexander, Michelle. *The New Jim Crow: Mass Incarceration in the Age of Colorblindness*. New York: New Press, 2010.

Bertrand, Marianne and Sendhil Mullainathan. "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination." *American Economic Review* 94 (2004):991-1013.

Abstract by author: We study race in the labor market by sending fictitious resumes to help-wanted ads in Boston and Chicago newspapers. To manipulate perceived race, resumes are randomly assigned African-American- or White-sounding names. White names receive 50 percent more callbacks for interviews. Callbacks are also more responsive to resume quality for White names than for African-American ones. The racial gap is uniform across occupation, industry, and employer size. We also find little evidence that employers are inferring social class from the names. Differential treatment by race still appears to still be prominent in the U.S. labor market.

Conley, Dalton. *Being Black, Living in the Red: Race, Wealth, and Social Policy in America*. Berkeley: University of California Press, 1999.

Guinier, Lani and Gerald Torres. *The Miner's Canary: Enlisting Race, Resisting Power, Transforming Democracy*. Cambridge: Harvard University Press, 2002.

Kaufman, Robert. "Assessing Alternative Perspectives on Race and Sex Employment Segregation." *American Sociological Review* 67 (2002): 547-72.

Abstract by author: Four major explanations for employment segregation--skill deficits, worker preferences, economic and organizational structure, and stereotyping/queuing--are assessed using a diverse and overlapping set of predictors: general skills and training, product market structure, race- and sex-typed tasks and conditions, desirable employment and growth rates, and links to other labor market actors. A two-stage measurement and analytic strategy controls for relevant worker-level factors. Data from the 1990 census PUMs are analyzed to measure the employment segregation of black women, black men, and white women in relation to white men across 1,917 labor market positions, net of human capital, family structure, geographic residence and labor supply. Archival data provide measures of variables characterizing labor market positions. Stereotyping and queuing explanations are broadly consistent with nearly all results, while a worker preference approach applies to somewhat fewer predictors and is largely but not wholly compatible with their effects. A skill deficits explanation applies to, and is supported by, a narrow set of findings, while the economic and organizational structure explanations are restricted in their relevance and receive limited support.

Krivo, Lauren J. and Robert L. Kaufman. "Housing and Wealth Inequality: Racial-Ethnic Differences in Home Equity in the United States." *Demography* 41 (2004): 585-605.

Abstract by author: In our study, we took a first step toward broadening our understanding of the sources of both housing and wealth inequality by studying differences in housing

equity among blacks, Hispanics, Asians, and non-Hispanic whites in the United States. Using data from the American Housing Survey, we found substantial and significant gaps in housing equity for blacks and Hispanics (but not for Asians) compared with whites, even after we controlled for a wide range of locational, life-cycle, socioeconomic, family, immigrant, and mortgage characteristics. Furthermore, the payoffs to many factors are notably weaker for minority than for white households. This finding is especially consistent across groups for the effects of age, socioeconomic status, and housing-market value. Blacks and Hispanics also uniformly receive less benefit from mortgage and housing characteristics than do whites. These findings lend credence to the burgeoning stratification perspective on wealth and housing inequality that acknowledges the importance of broader social and institutional processes of racial-ethnic stratification that advantage some groups, whites in this case, over others.

Krivo, Lauren J., Ruth D. Peterson and Danielle C. Kuhl. "Segregation, Racial Structure and Neighborhood Violent Crime." *American Journal of Sociology* 114 (2009): 1765-1802.

Abstract by author: Drawing on structural racism and urban disadvantage approaches, this article posits a broad influence of citywide racial residential segregation on levels of violent crime across all urban neighborhoods regardless of their racial/ethnic composition. Multilevel models based on data from the National Neighborhood Crime Study for 7,622 neighborhoods in 79 cities throughout the United States reveal that segregation is positively associated with violent crime for white and various types of nonwhite neighborhoods. Nonetheless, there is a lack of parity in violence across these types of communities reflecting the larger racialized social system in which whites are able to use their privileged position to reside in the most advantaged neighborhoods, while African-Americans and Latinos live in the most disadvantaged urban communities and therefore bear the brunt of urban criminal violence.

Massey, Douglas S. *Categorically Unequal: The American Stratification System*. New York: Russell Sage Foundation, 2007.

Oliver, Melvin L. and Thomas M. Shapiro. *Black Wealth/White Wealth: A New Perspective on Racial Inequality*. New York: Routledge, 2006.

Orfield, Gary and Nancy McArdle. *The Vicious Cycle: Segregated Housing, Schools and Intergenerational Inequality*. Cambridge, MA: Joint Center for Housing Studies, 2006.

Pager, Devah and Lincoln Quillian. "What Employers Say Versus What They Do." *American Sociological Review* 70 (2005): 355-80.

Abstract by author: This article considers the relationship between employers' attitudes toward hiring ex-offenders and their actual hiring behavior. Using data from an experimental audit study of entry-level jobs matched with a telephone survey of the same employers, the authors compare employers' willingness to hire black and white ex-offenders, as represented both by their self-reports and by their decisions in actual hiring situations. Employers who indicated a greater likelihood of hiring ex-offenders in the survey were no more likely to hire an ex-offender in practice. Furthermore, although the survey results indicated no difference in the likelihood of hiring black versus white ex-offenders, audit results show large differences by race. These comparisons suggest that employer surveys-even those using an

experimental design to control for social desirability bias-may be insufficient for drawing conclusions about the actual level of hiring discrimination against stigmatized groups.

Peterson, Ruth D. and Lauren Joy Krivo. *Divergent Social Worlds: Neighborhood Crime and the Racial-Spatial Divide*. New York: Russell Sage Foundation, 2010.

Royster, Deirdre A. *Race and the Invisible Hand: How White Networks Exclude Black Men from Blue-collar Jobs*. Berkeley: University of California Press, 2003.

Rubinowitz, Leonard S. and James E. Rosenbaum. *Crossing the Class and Color Lines: From Public Housing to White Suburbia*. Chicago: University of Chicago Press, 2000.

Rugh, Jacob and Douglas Massey. "Racial Segregation and the American Foreclosure Crisis." *American Sociological Review*. 75 (2010): 629-651.

Abstract by author: The rise in subprime lending and the ensuing wave of foreclosures was partly a result of market forces that have been well-identified in the literature, but it was also a highly racialized process. We argue that residential segregation created a unique niche of minority clients who were differentially marketed risky subprime loans that were in great demand for use in mortgage-backed securities that could be sold on secondary markets. We test this argument by regressing foreclosure actions in the top 100 U.S. metropolitan areas on measures of black, Hispanic, and Asian segregation while controlling for a variety of housing market conditions, including average creditworthiness, the extent of coverage under the Community Reinvestment Act, the degree of zoning regulation, and the overall rate of subprime lending. We find that black residential dissimilarity and spatial isolation are powerful predictors of foreclosures across U.S. metropolitan areas. To isolate subprime lending as the causal mechanism through which segregation influences foreclosures, we estimate a two-stage least squares model that confirms the causal effect of black segregation on the number and rate of foreclosures across metropolitan areas. We thus conclude that segregation was an important contributing cause of the foreclosure crisis, along with overbuilding, risky lending practices, lax regulation, and the bursting of the housing price bubble.

Shapiro, Thomas M. *The Hidden Cost of Being African American: How Wealth Perpetuates Inequality*. New York: Oxford University Press, 2004.

Squires, Gregory and Charis Kubrin. "Privileged Places: Race, Uneven Development and the Geography of Opportunity in Urban America." *Urban Studies* 42 (2005): 47-69.

Abstract by author: David Rusk, former Mayor of Albuquerque, New Mexico, has observed that "bad neighborhoods defeat good programs". This paper identifies the underlying causes of bad neighborhoods along with their costs to local residents and residents throughout the region. It is a critical essay that traces recent patterns of uneven metropolitan development, the social forces generating these patterns, their many costs and potential remedies. It demonstrates how the interrelated processes of sprawl, concentration of poverty and racial segregation shape the opportunity structure facing diverse segments of the nation's urban and metropolitan population. In so doing, it draws on recent scholarly literature from various disciplines, government data and documents, research institute

reports and the mass media. Topics addressed include income and wealth disparities, employment opportunities, housing patterns, access to health care and exposure to crime. While recognizing the role of individual choice and human capital, the paper focuses on public policy decisions and related private-sector activities in determining how place and race shape the opportunity structure of metropolitan areas. Finally, the paper explores various policy options to sever the linkages among place, race and privilege in the nation's urban communities.

Tilly, Charles. *Durable Inequality*. Los Angeles: University of California Press, 1998.

Wilkes, Rima and John Iceland. "Hypersegregation in the Twenty-First Century." *Demography* 41 (2004): 23-36.

Abstract by author: We used metropolitan-level data from the 2000 U.S. census to analyze the hypersegregation of four groups from whites: blacks, Hispanics, Asians, and Native Americans. While blacks were hypersegregated in 29 metropolitan areas and Hispanics were hypersegregated in 2, Asians and Native Americans were not hypersegregated in any. There were declines in the number of metropolitan areas with black hypersegregation, although levels of segregation experienced by blacks remained significantly higher than those of the other groups, even after a number of factors were controlled. Indeed, although socioeconomic differences among the groups explain some of the difference in residential patterns more generally, they have little association with hypersegregation in particular, indicating the overarching salience of race in shaping residential patterns in these highly divided metropolitan areas.

## Implicit Racial Bias

Bertrand, Marianne, Dolly Chugh and Sendhil Mullainathan. "Implicit Discrimination." *American Economic Review* 95 (2005): 94–98.

Abstract by author: This article provides information on a study on implicit discrimination. Most modern social psychologists believe that attitudes occur in both implicit and explicit modes, suggesting that people can think, feel and behave in ways that oppose their explicitly expressed views, and even, explicitly known self-interests. A widely used measure of implicit mental processes is the Implicit Association Test (IAT). The IAT relies on test-takers' speed of response to represent the strength of their unconscious mental associations. IAT are used to measure a wide range of implicit attitudes about social groups, products or self-identity. A key differential feature of potential remedies to implicit discrimination is that they could limit the amount of discrimination without forcing agents to make decisions against their will.

Blair, Irene V., Charles M. Judd and Kristine M. Chapleau. "The Influence of Afrocentric Facial Features in Criminal Sentencing." *Psychological Science* 15 (2004): 674–679.

Abstract by author: Prior research has shown that within a racial category, people with more Afrocentric facial features are presumed more likely to have traits that are stereotypic of Black Americans compared with people with less Afrocentric features. The present study investigated whether this form of feature-based stereotyping might be observed in criminal-sentencing decisions. Analysis of a random sample of inmate records showed that Black and White inmates, given equivalent criminal histories, received roughly equivalent sentences. However, within each race, inmates with more Afrocentric features received harsher sentences than those with less Afrocentric features. These results are consistent with laboratory findings, and they suggest that although racial stereotyping as a function of racial category has been successfully removed from sentencing decisions, racial stereotyping based on the facial features of the offender is a form of bias that is largely overlooked.

Eberhardt, Jennifer L., Paul G. Davies, Valerie J. Purdie-Vaughns and Sheri L. Johnson. "Looking Deathworthy: Perceived Stereotypicality of Black Defendants Predicts Capital Sentencing Outcomes." *Psychological Science* 17 (2006): 383–386.

Abstract by author: Researchers previously have investigated the role of race in capital sentencing, and in particular, whether the race of the defendant or victim influences the likelihood of a death sentence. In the present study, we examined whether the likelihood of being sentenced to death is influenced by the degree to which a Black defendant is perceived to have a stereotypically Black appearance. Controlling for a wide array of factors, we found that in cases involving a White victim, the more stereotypically Black a defendant is perceived to be, the more likely that person is to be sentenced to death.

Hilliari, Kirin F and Richard I. Kemp. "Barack Obama or Barry Dunham? The Appearance of Multiracial Faces Is Affected by the Names Assigned to Them." *Perception* 37 (2008): 1605-1608.

Abstract by author: Does semantic information in the form of stereotypical names influence participants' perceptions of the appearance of multiracial faces? Asian-Australian and European-Australian participants were asked to rate the appearance of Asian-Australian

faces given typically Asian names, European-Australian faces given typically European names, multiracial faces given Asian names, and multiracial faces given European names. Participants rated the multiracial faces given European names as looking significantly 'more European' than the same multiracial faces given Asian names. This study demonstrates how socially derived expectations and stereotypes can influence face perception.

Liggett, Tonda. "Frames of Reference: The Impact of Race on Teaching Strategy and Classroom Discussion." *Urban Review: Issues and Ideas in Public Education* 40 (2008): 386-402.

Abstract by author: In this article, I examine the role of teacher racial identity on teaching strategy and the treatment of race in classroom discussions. I explicate how the pattern of minimizing the negative racial comments made to English language learners played out in participants' teaching and how it is reflective of socially constructed notions of race and racial discourse. The treatment of racial issues, in this sense, can be seen as a microcosm of larger social, historical, and political factors that shape individuals' thinking about equity and diversity. I argue that by analyzing these underlying factors in teacher education courses, the unconscious and often subtle ways that stereotypes based on race, culture, or English language proficiency, can be demystified and disrupted.

Lynch, Michael J., E. Britt Patterson and Kristina K. Childs. *Racial Divide: Racial and Ethnic Bias in the Criminal Justice System*. Monsey, N.Y.: Criminal Justice Press, 2008.

Marsh, Jason, Rodolfo Mendoza-Denton and Jeremy Adam Smith. *Are we born racist? New Insights from Neuroscience and Positive Psychology*. Boston: Beacon Press, 2010.

Mendelberg, Tali. *The Race Card: Campaign Strategy, Implicit Messages, and the Norm of Equality*. Princeton, NJ: Princeton University Press, 2001.

Nosek, Brian A. and Jeffrey J. Hansen. "The Associations in our Heads Belong to Us: Searching for Attitudes and Knowledge in Implicit Evaluation." *Cognition and Emotion* 22 (2008): 553-594.

Abstract by author: Explicitly, humans can distinguish their own attitudes from evaluations possessed by others. Implicitly, the viability of a distinction between attitudes and evaluative knowledge is less clear. We investigated relations between explicit attitudes, cultural knowledge and the Implicit Association Test (IAT). In seven studies (158 samples, N=107,709), the IAT was reliably and variably related to explicit attitudes, and explicit attitudes accounted for the relationship between the IAT and cultural knowledge. We suggest that people do not have introspective access to the associations formed via experience in a culture. Ownership of mental associations is established by presence in mind and influence on thinking, feeling and doing. Regardless of origin, associations are influential depending on their availability, accessibility, salience, and applicability. Distinguishing associations as "not mine" is a self-regulatory act and contributes to the distinction between explicit evaluation, where such acts are routine, and implicit evaluation, where they are not.

Penner, Andrew M. and Aliya Saperstein. "How Social Status Shapes Race." *Proceedings of the National Academy of Sciences* 105 (2008): 19628-30.

Abstract by author: We show that racial perceptions are fluid; how individuals perceive their own race and how they are perceived by others depends in part on their social position. Using longitudinal data from a representative sample of Americans, we find that individuals who are unemployed, incarcerated, or impoverished are more likely to be seen and identify as black and less likely to be seen and identify as white, regardless of how they were classified or identified previously. This is consistent with the view that race is not a fixed individual attribute, but rather a changeable marker of status.

Rudman, Laurie A. and Richard D. Ashmore. "Discrimination and the Implicit Association Test." *Group Processes and Intergroup Relations* 10 (2007): 359-372.

Abstract by author: Prejudice researchers have been criticized for failing to assess behaviors that reflect overtly hostile actions (i.e. racial animus; Arkes & Tetlock, 2004; Mackie & Smith, 1998). Two studies sought to begin to fill this gap in the implicit literature by showing that scores on the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) are linked to harmful intergroup behaviors. In Study 1, the IAT predicted self-reported racial discrimination, including verbal slurs, exclusion, and physical harm. In Study 2, the IAT predicted recommended budget cuts for Jewish, Asian, and Black student organizations (i.e. economic discrimination). In each study, evaluative stereotype (but not attitude) IATs predicted behaviors even after controlling for explicit attitudes. In concert, the findings suggest that implicit stereotypes are more predictive of overtly harmful actions than implicit attitudes in the intergroup relations domain.

Stanley, Damian, Peter Sokol-Hessner, Mahzarin Banaji and Elizabeth Phelps. "Implicit race attitudes predict trustworthiness judgments and economic trust decisions." *Proceedings of the National Academy of Science* 108 (2011): 7710-7715.

Abstract by author: Trust lies at the heart of every social interaction. Each day we face decisions in which we must accurately assess another individual's trustworthiness or risk suffering very real consequences. In a global marketplace of increasing heterogeneity with respect to nationality, race, and multiple other social categories, it is of great value to understand how implicitly held attitudes about group membership may support or undermine social trust and thereby implicitly shape the decisions we make. Recent behavioral and neuroimaging work suggests that a common mechanism may underlie the expression of implicit race bias and evaluations of trustworthiness, although no direct evidence of a connection exists. In two behavioral studies, we investigated the relationship between implicit race attitude (as measured by the Implicit Association Test) and social trust. We demonstrate that race disparity in both an individual's explicit evaluations of trustworthiness and, more crucially, his or her economic decisions to trust is predicted by that person's bias in implicit race attitude. Importantly, this relationship is robust and is independent of the individual's bias in explicit race attitude. These data demonstrate that the extent to which an individual invests in and trusts others with different racial backgrounds is related to the magnitude of that individual's implicit race bias. The core dimension of social trust can be shaped, to some degree, by attitudes that reside outside conscious awareness and intention.



Steele, Claude. *Whistling Vivaldi: And Other Clues to How Stereotypes Affect Us*. New York: W.W. Norton & Company, 2010.

Stone, Christopher, Zachary Carter, Thomas Belfiore, Ella M. Bully-Cummings, Rev. Dr. Herbert Daughtry, Michael J. Farrell, George Gascón, Arva Rice, Lew Rice and Damon T. Hewitt. "Reducing Inherent Danger: Report of the New York State Task Force on Police-on-Police Shootings." New York State Task Force on Police-on-Police Shootings Report, May 27, 2010.

Abstract by author: Since 1981, some 26 police officers across the United States have been shot and killed by fellow police officers who have mistaken them for dangerous criminals. Over the last fifteen years, ten of the fourteen officers killed in these mistaken-identity, police-on-police shootings have been people of color. The two most recent of these fatal, police-on-police shootings took place in New York State, and in both cases the victims were off-duty, African-American police officers. In response, New York Governor David A. Paterson empanelled this Task Force, which undertook a nationwide, systematic investigation of mistaken-identity, police-on-police shootings. The task force makes specific recommendations for police departments, municipalities, and state and federal government.

Westen, Drew. *The Political Brain: The Role of Emotion in Deciding the Fate of the Nation*. New York: PublicAffairs, 2007.

White, Ismail K. "When Race Matters and When It Doesn't: Racial Group Differences in Response to Racial Cues." *American Political Science Review* 101 (2007): 339-354.

Abstract by author: Building on previous research on the effects of racial priming on the opinions of White Americans, this paper engages the question of how exposure to racial cues in political messages shapes the opinions of African Americans. I argue that explanations of racial priming that focus exclusively on White Americans are insufficient to explain how racial cues influence the opinions of Black Americans, as they fail to account for the activation of in-group attitudes and mis-specify the role of explicit racial cues. In two separate laboratory experiments, I test the effects of explicitly racial, implicitly racial, and nonracial verbal cues on both Black and White Americans' assessments of an ostensibly nonracial issue. The results point to important racial differences in the effectiveness of explicit and implicit racial verbal cues in activating racial thinking about an issue. Only frames that provide oblique references to race successfully activated racial out-group resentment for Whites. Among Blacks, explicit references to race most reliably elicited racial thinking by activating racial in-group identification, whereas the effect of implicit cues was moderated by the activation of negative representations of the in group. These findings not only demonstrate that racial attitude activation works differently for African Americans than for Whites but also challenge conventional wisdom that African Americans see all political issues through a racial lens.

## Systems Thinking

Booth, Sweeney L. and John Sterman. "Bathtub Dynamics: Initial Results of a Systems Thinking Inventory." *System Dynamics Review* 16 (2000): 249–294.

Abstract by author: In a world of accelerating change, educators, business leaders, environmentalists and scholars are calling for the development of systems thinking to improve our ability to take effective actions. Through courses in the K-12 grades, universities, business schools, and corporations, advocates seek to teach people to think systemically. These courses range from one-day workshops with no mathematics to graduate level courses stressing formal modeling. But how do people learn to think systemically? What skills are required? Does a particular type of academic background improve one's ability to think systemically? What systems concepts are most readily understood? Which tend to be most difficult to grasp? We describe initial results from an assessment tool or systems thinking inventory. The inventory consists of brief tasks designed to assess particular systems thinking concepts such as feedback, delays, and stocks and flows. Initial findings indicate that subjects from an elite business school with essentially no prior exposure to system dynamics concepts have a poor level of understanding of stock and flow relationships and time delays. Performance did not vary systematically with prior education, age, national origin, or other demographic variables. We hope the inventory will eventually provide a means for testing the effectiveness of training and decision aids used to improve systems thinking skills. We discuss the implications of these initial results and explore steps for future research.

Hovmand, Peter S. and Joseph O'Sullivan. "Lessons from an Interdisciplinary System Dynamics Course." *System Dynamics Review* 24 (2008), 479-488.

Abstract by author: System dynamics has long held a promise of solving social problems. Such efforts benefit from interdisciplinary teams that can combine strong technical skills for modeling and analysis with people skills for working with stakeholders and understanding the substantive issues of social problems. In this note we describe a joint graduate system dynamics course between social work and electrical and systems engineering that emphasizes students learning how to develop and work in interdisciplinary teams to address social problems. We discuss the advantages of such teams, some of the challenges, and share lessons from the experience.

Kim, Daniel. "Introduction to Systems Thinking." Waltham, MA: Pegasus Communications, 1999.

Lane, David C. "Articles - Rerum Cognoscere Causas: Part I - How Do the Ideas of System Dynamics Relate to Traditional Social Theories and the Voluntarism/Determinism Debate?" *System Dynamics Review* 17 (2001): 97-118.

Abstract by author: This is the first half of a two-part paper which deals with the social theoretic assumptions underlying system dynamics. The motivation is that clarification in this area can help mainstream social scientists to understand how our field relates to their literature, methods and concerns. Part I has two main sections. The aim of the first is to answer the question: How do the ideas of system dynamics relate to traditional social theories? The theoretic assumptions of the field are seldom explicit but rather are implicit in its practice. The range of system dynamics practice is therefore considered and related to a

framework—widely used in both operational research (OR) and systems science—that organizes the assumptions behind traditional social theoretic paradigms. Distinct and surprisingly varied groupings of practice are identified, making it difficult to place system dynamics in any one paradigm with any certainty. The difficulties of establishing a social theoretic home for system dynamics are exemplified in the second main section. This is done by considering the question: Is system dynamics deterministic? An analysis shows that attempts to relate system dynamics to strict notions of voluntarism or determinism quickly indicate that the field does not fit with either pole of this dichotomous, and strictly paradigmatic, view. Part I therefore concludes that definitively placing system dynamics with respect to traditional social theories is highly problematic. The scene is therefore set for Part II of the paper, which proposes an innovative and potentially fruitful resolution to this problem.

Lane, David C. "Articles - Rerum Cognoscere Causas: Part II -- Opportunities Generated by the Agency/Structure Debate and Suggestions for Clarifying the Social Theoretic Position of System Dynamics." *System Dynamics Review* 17 (2001): 293-309.

Abstract by author: This is the second half of a two-part paper dealing with the social theoretic assumptions underlying system dynamics. In the first half it was concluded that analyzing system dynamics using traditional, paradigm-based social theories is highly problematic. An innovative and potentially fruitful resolution is now proposed to these problems. In the first section it is argued that in order to find an appropriate social theoretic home for system dynamics it is necessary to look to a key exchange in contemporary social science: the agency/structure debate. This debate aims to move beyond both the theories based only on the actions of individual human agents, and those theories that emphasize only structural influences. Emerging from this debate are various theories that instead aim to unite the human agent view of the social realm with views that concentrate solely on system structure. It is argued that system dynamics is best viewed as being implicitly grounded in such theories. The main conclusion is therefore that system dynamics can contribute to an important part of social thinking by providing a formal approach for explicating social mechanisms. This conclusion is of general significance for system dynamics. However, the over-arching aim of the two-part paper is to increase the understanding of system dynamics in related disciplines. Four suggestions are therefore offered for how the system dynamics method might be extended further into the social sciences. It is argued that, presented in the right way, the formal yet contingent feedback causality thinking of system dynamics should diffuse widely in the social sciences and make a distinctive and important contribution to them.

Luna-Reyes, Luis F, Ignacio J. Martinez-Moyano, Theresa A. Pardo, Anthony M. Cresswell, David F. Andersen and George P. Richardson. "Anatomy of a Group Model-Building Intervention: Building Dynamic Theory from Case Study Research." *System Dynamics Review* 22 (2006): 291-320.

Abstract by author: The system dynamics group at the Rockefeller College of the University at Albany has been developing techniques to create system dynamic models with groups of managers during the last 25 years. Building upon their tradition in decision conferencing, the group has developed a particular style that involves a facilitation team in which people play different roles. Throughout these years of experience, the group has also developed several "scripts" to elicit knowledge from experts based on small-groups research, and well-

established practices in the development of system dynamics models. This paper constitutes a detailed documentation of a relatively small-scale modeling effort that took place in early 2001, offering a “soup to nuts” description of group model building at Albany. The paper describes in detail nine of the scripts that the group has developed, offering some reflections about their advantages and limitations.

Meadows, Donella H. and Diana Wright. *Thinking in Systems: A Primer*. White River Junction, VT: Chelsea Green Pub, 2008.

Morecroft, John. *Strategic Modeling and Business Dynamics: A Feedback Systems Approach*. John Wiley & Sons, 2007.

O'Connor, Joseph and Ian McDermott. *The Art of Systems Thinking: Essential Skills for the Creativity and Problem Solving*. London: Thorsons, 1997.

Richardson, George P. *Feedback Thought in Social Science and Systems Theory*. Philadelphia: University of Pennsylvania Press, 1999.

Rouwette, Etienne, Jac Vennix and Theo Mullekom. “Group Model Building Effectiveness: a Review of Assessment Studies.” *System Dynamics Review* 18 (2002): 5–45.

Abstract by author: Over the last decades system dynamicists have experimented with approaches to achieve more involvement of their clients in the model building process. As a result the number of reports in the literature on the use of system dynamics as an organizational intervention tool has increased dramatically. From the literature we have identified 107 cases that provide details on the modeling process and the assessment of results. The cases show a wide variety in the way the interventions are reported and assessed. From a research point of view this is clearly an undesirable state of affairs. This article reports on a meta analysis of findings of these studies and tries to provide an overview of outcome studies on system dynamics interventions. It attempts to draw some preliminary conclusions on the effectiveness of system dynamics modeling interventions, to clarify differences in definitions of outcomes, and to provide guidelines for more standardized assessments and reports. Rather than remaining in the stage of single case descriptions, the latter will enable the accumulation of research results in the future, a prerequisite for institutional learning within the system dynamics community.

Sterman, John D. “All Models Are Wrong: Reflections on Becoming a Systems Scientist.” *System Dynamics Review* 18 (2003): 501-531.

Abstract by author: Thoughtful leaders increasingly recognize that we are not only failing to solve the persistent problems we face, but are in fact causing them. System dynamics is designed to help avoid such policy resistance and identify high-leverage policies for sustained improvement. What does it take to be an effective systems thinker, and to teach system dynamics fruitfully? Understanding complex systems requires mastery of concepts such as feedback, stocks and flows, time delays, and nonlinearity. Research shows that these concepts are highly counterintuitive and poorly understood. It also shows how they can be taught and learned. Doing so requires the use of formal models and simulations to test our mental models and develop our intuition about complex systems. Yet, though essential,

these concepts and tools are not sufficient. Becoming an effective systems thinker also requires the rigorous and disciplined use of scientific inquiry skills so that we can uncover our hidden assumptions and biases. It requires respect and empathy for others and other viewpoints. Most important, and most difficult to learn, systems thinking requires understanding that all models are wrong and humility about the limitations of our knowledge. Such humility is essential in creating an environment in which we can learn about the complex systems in which we are embedded and work effectively to create the world we truly desire.

Sterman, John D. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Irwin/McGraw-Hill: New York, 2000.

Thompson, Kimberly M. and Radboud J. Duintjer Tebbens. "Using System Dynamics to Develop Policies That Matter: Global Management of Poliomyelitis and Beyond." *System Dynamics Review* 24 (2008): 433-449.

Abstract by author: We offer an example of modeling that influenced global health policy related to polio and we provide some insights about the modeling process. Although system dynamics lies at the heart of our modeling, we emphasize that downplaying the modeling to focus on the policy questions played a critical role in the use of the results by decision makers. Here we provide details of the system dynamics modeling that underlies our research on polio, and discuss the process we followed to bring scientific modeling of a highly complex issue to policymakers. We hope that providing a better understanding of our efforts and describing our continuing analytical journey provides useful insights for others who seek to use system dynamics to develop policies that matter.

Vennix, Jac. "Group Model-Building: Tackling Messy Problems." *System Dynamics Review* 15 (1999): 379-402.

Abstract by author: Group model-building here refers to a system dynamics model-building process in which a client group is deeply involved in the process of model construction. The problem that is modeled can be reasonably well defined, but it can also take the form of an ill-defined or messy problem, i.e., a situation in which opinions in a management team differ considerably. These messy managerial situations are difficult to handle, primarily because thus far little theoretical work has been conducted to shed more light on the question why these messy situations exist and why it may be difficult for a management team to reach agreement. This article fills this theoretical gap by drawing on literature from sociology, (social) psychology and small-group research. Insights from this literature are discussed and translated into guidelines for conducting Group Model-Building projects for messy problems. The article ends with the conclusion that system dynamicists should include Group Model-Building and facilitation training in their teaching programs.



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