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# The Emergence of the Social and Behavioral Sciences in Dentistry: Lois Cohen as Principal Architect

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## Introduction

"No way," you would have said back then...no way that a young girl born into a pre-WWII working-class family in Philadelphia could be expected not only to go to college, but also to earn a doctoral degree in sociology, with scholarships and fellowships from the State of Pennsylvania Senate and the National Science Foundation along the way, and then...are you ready for this?...enter into a career in dentistry as a research sociologist, at a time when there were hardly any women dentists—let alone female dental researchers of any type—joining only a handful of scientists in the whole country to conduct social science research in dentistry.

You don't enter such a field—you create it. And from this unlikely set of beginning circumstances, could she not only survive but also actually thrive in the discover-as-you-go environment of social science dental research of about 35 years ago? How about going on to lead the largest worldwide dental research project ever undertaken—and then, a few years later, going on to do it again!...along the way, producing more than 100 first-authored publications and dozens of co-authored ones, including influential texts and research-agenda-setting monographs, maybe rising to second-in-command at NIDCR, receiving world-wide recognition for her scientific and professional achievements—made all the more special because they were so unlikely: honorary membership in the American Dental Association, honored by the American and International Colleges of Dentists and the Federation Dentaire Internationale, and an honorary doctorate from Purdue University, as well as recognition for outstanding research and exemplary service from the NIDCR, the USPHS, and from her chosen profession of Sociology. "No way," you would have said 'way back then. But then, you didn't know Lois Cohen.

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## In the beginning—The early career

Lois Ruth Kushner Cohen's journey defining a pragmatic sociology of dentistry is as full of serendipity and surprise as one might expect, given that a field was being created where there was none, by applying, almost for the first time, methods and concepts from the social sciences to study problems of dentistry and oral health. The same young woman who, early on, wasn't sure how, or even if, Social Work and Sociology were different (*sic!*) accompanied her new husband to graduate school at Purdue University in Indiana, where she enrolled as a graduate student in Sociology (they didn't have a program in Social Work, so the choice was a "no-brainer"). The intellectual rigor of that field, the broad scope of its scientific purview, and the challenge of bringing careful scientific methodology to bear on the analysis of large questions of social importance allowed Sociology to win out as the field of endeavor to which she committed her professional life. An undergraduate honors thesis done at the University of Pennsylvania and devoted to a demographic analysis of Palestine and Israel by Continent of Origin of Jewish inhabitants (revealing a life-long interest in the study of and support for the newly created state of Israel) led to graduate studies of job mobility and migration of scientists awarded doctorates in the US. Lois was now on a path from which she would never stray very far: The sociology of science and scientists would become for her the sociology of dental science and dentists, designing and conducting large-scale analyses for informed decision-making that would allow dentistry to meet the challenge of burgeoning health needs, not only at home but around the world.

The history of this remarkable journey into expanding the consciousness and horizons of dentistry beyond oral biology and dental technology has its origins in time right after World War II, when sociologists began to study how social behavior and societal forces influenced disease onset and recovery. The burgeoning field of social science in medicine generated fledgling efforts to bring to the dental profession a similarly enlightened understanding of how complex interactions among cultural, societal, behavioral, and emotional factors could modify the onset and distribution of

dental and oral diseases—not only the pandemic dental caries and periodontal diseases, but also the less prevalent but profoundly disabling oral cancer and craniofacial abnormalities. But it was not until the late 1950s and 1960s that a relatively newly created USPHS Division of Dental Public Health (DDPH) began producing a small but respected body of literature connecting the behavioral and social sciences with oral disease or injury and recovery.

### Lois goes to Washington (DC)

Lois came to Washington, DC, in the early '60s with her husband, who was now a new NIH scientist. She was highly sought after by the National Science Foundation and the National Center for Health Statistics for her demonstrated ability to use comprehensive scientific data sets to address large-scale societal and health-related issues. But she was holding out for a job with a newly developed Social Studies Branch of the DDPH, which held out the promise of developing large databases capable of addressing issues ranging from oral disease prevention to dentist-manpower distribution. Lois was intrigued that the job opportunity related specifically to dental and oral diseases, just because so little had been done in the field. She vigorously pursued, and in her job-seeking actually held out for, this opportunity to undertake original and programmatic efforts linking scientific data-gathering to the actual design and evaluation of dental public health interventions. However, we are dealing with governmental bureaucracy here, and to pay the rent while waiting for the US Government to decide, good fortune again intervened. Lois was recruited as a part-time faculty member teaching Sociology at Howard University. It was the student activist '60s, and a time for Lois which was both stimulating and instructive, giving her a chance not only to develop her teaching skills, but also to encounter first-hand how societal forces influenced public policy (the SNCC leader Stokely Carmichael was one of her students during this time).

Soon enough, the USPHS in its wisdom came through, and Lois was hired to work with Robert O'Shea, a pioneering sociologist in the area of health and health care. They were assigned to the Disease Prevention Unit of the Division of Dental Health (USPHS), and it soon became clear that these fledglings were on their own. There was neither a body of literature nor a cadre of experienced workers these pioneering social scientists could consult as they set out to establish a social and behavioral science toehold in dentistry. Dentistry was still very much a profession characterized historically as technical in its self-identification, with but a few decades of experience as a biologically oriented profession as well. The notion that sensitivity to psychosocial issues was similarly a responsibility of every health profession was only dimly, if at all, a consideration. Lois identified with the desirability of expanding the consciousness of dentistry to reflect an integrated biologic, psychologic, and societal perspective even as such an expanded *bio-psycho-social* model of health and diseases was being nurtured in the health field more generally.

There were at this time few dentists dually trained as

social scientists; but even without any prior precedent or available guidelines from any systematic training programs, Lois and a small team of social scientists (that included, in addition to Robert O'Shea, Ervin Linn, Louise Richards, Lola [Fritz] Irelan, Jack Lefcovitz, and Stafford Metz) organized a social and behavioral science research agenda for dentistry around two foci that reflected the most urgent problems of the day facing dentistry: (1) disease prevention, and (2) deployment of dental manpower.

### Early dentally related research

For Lois, disease prevention research began with a focus on gathering reliable data about the nature of the public's resistance to water fluoridation. Despite abundant biologically based evidence confirming both the efficacy and safety of water fluoridation as the single best available public health approach for primary prevention of caries, public acceptance of water fluoridation in many American communities was far from automatic, often meeting virulent opposition. From national opinion surveys they designed and conducted, it was possible to demonstrate how the belief systems underlying this resistance could be documented and quantified. While they discovered some outlandish notions—for example, that some people associated water fluoridation with room deodorizing—they also quantified the extent of people's convictions about more pragmatic as well as more profound—but still ill-founded—threats that water fluoridation seemed to hold for an unknown number of our citizens. Such strongly held convictions included the belief that fluoride in the water supply would rust out pots, pans, and home plumbing or increase chances of cancer or bone fractures. Since beliefs, attitudes, and the behaviors they motivate cannot be changed until they are brought to light, uncovering these views on fluoridation held by the public allowed for the design of more effective public health fluoridation efforts oriented toward gaining greater public acceptance through education and information dissemination, dispelling unscientific biases and undue personal concerns.

### Toward a sociology of dentistry

Early seminal research in other key arenas of public health dentistry shed light on attitudes toward personal dental health, attitudes toward professional dental care in the US, and, presaging the current era by several decades, attitudes of the public toward prepaid dental health care. In all of these arenas, efforts by Lois and her colleagues led to direct interventions or further research exploring the efficacy of alternative public health interventions to yield a public better informed about safe and effective means for preventing or managing dental and oral diseases. The prime significance of this application of social science research methodology to dentistry was to demonstrate that dental and orofacial conditions and their management could be altered by introducing into the technically oriented profession a biopsychosocial model reflecting new awarenesses of the

interaction between biologic processes and behavioral and social forces.

In this same era that saw the beginnings of a sociology of dentistry through a focus on the patient, Lois and colleagues began a series of studies on dental manpower. Their first studies targeted how the dental profession viewed itself and how professionally held belief systems and attendant dentist behaviors could affect the distribution of dental pathobiology. First efforts targeting dentists as the object of social science study began with the objective of preventing the ravages of oral cancer. The story of how these dental manpower studies were developed over several years and what was learned from them is instructive for understanding the role and potential impact of multi-disciplinary biopsychosocial research when the object of study is the health professional. It had been established, and remains the case, that oral cancers, of all forms of human malignant disease, are among the most curable if detected early and treated promptly. Unfortunately, the morbidity and mortality from oral cancer were higher than could be explained from the known ability of this form of malignant disease to be reversed in its early stages.

In the mid-sixties, Lois and her colleagues, notably Robert O'Shea, undertook a major research campaign directed at general-practice dentists to identify methods for increasing the use of available early detection methods for oral cancers. Their multi-dimensional conceptualization of such problems yielded a research agenda that was truly interdisciplinary. The social sciences contributed theoretical models for the dissemination of information, the design of effective survey instruments and teaching materials—the most effective means to initiate and maintain behavior change among dental clinicians—and powerful data analytic methods for studying survey and clinical trials data. The basic sciences contributed biologic mechanisms of action for both the disease processes and the biologically based detection principles; while applied clinical and technical research contributed the most effective means for detecting oral cancers in clinical settings. The first randomized clinical trials in dentistry which relied on social science methodology and concepts were initiated. They included focus groups to identify leaders in the dental practice community who might serve as persuasive change agents, appropriate distribution of information to dentists and patients, and specific provision for taking smears and biopsies of intra-oral tissues, with instructions for the management of the specimens and incentives to perform the procedures and to comply with the study demands.

Compliance in the study was excellent among enrolled clinicians, but a profound observation, quite different from what these social scientists expected, was uncovered which, together with other study findings, constituted an important publication in the *Journal of the American Dental Association*. The startling findings accounting for the profession's reluctance to perform oral cancer screening using biologically based current methodology derived not from concerns with excess time demands in busy practices or even financial reimbursement; rather, as dentists were willing to acknowledge, their reluctance stemmed from professional identity issues—dentists of that era were reluctant to

diagnose soft-tissue lesions in the mouth, reluctant to perform soft-tissue biopsies, and reluctant to engage patients in a discussion of oral cancer because of their insecurity over entering into the clinical arena of intra-oral soft-tissue pathobiology and its consequences. Simply put, the modal dentist of that era felt inadequately trained in the necessary diagnostic and management methods associated with detection, communication, and treatment of oral cancer; dentists' professional training and identity did not extend to the management of such significant oral soft-tissue disease, and they were not eager to accept responsibility for such an important health concern where, as they openly acknowledged, their training was lacking. These studies and numerous others in the decades that followed contributed significantly to initiating an era of critical self-examination on the part of the profession, and these studies significantly affected dental education; in addition, the earliest studies again validated the utility of research from a biopsychosocial perspective.

### Expanding horizons—International studies

As these larger issues concerning the nature of dentistry itself continued to be investigated, it was soon apparent to Lois and her colleagues that no data were available demonstrating the connection between methods for delivering dental care and actual oral health status. US dentistry was considered a "gold standard" for the delivery of quality dental care, and the level of oral health of Americans was similarly considered a worthy benchmark, at least in the US. But little was known about how the US stacked up with its counterparts around the world. Did it make any difference to one's oral health if, for example, primary dental care was delivered by a dentist or by a less-well-trained paraprofessional, as was occurring, at least for children, in some other parts of the industrialized and developing world? How was dental care reimbursed, and how prevalent were preventive methods? There simply were no data available which related oral health status to alternative model systems for managing dental and oral diseases and to how accessible, available, and acceptable dental care was in different populations around the world as a function of alternative dental care delivery systems.

For Lois, these were scientifically generated need-to-know questions approachable only from a multi-disciplinary scientific perspective. No small study agenda here, and no small purpose, either. But again, Lois was in charge (characteristically, she's too modest, of course, to say publicly how she led the way), and the first international collaborative study of oral health outcomes was undertaken with the cooperation and support of prestigious participants from organized dentistry as well as public health research agencies around the world, including WHO, FDI, ADA, and the Federal Government's Department of Health, Education and Welfare (HEW).

The first World Health Organization/Division of Dentistry International Collaborative Study of Dental Manpower Systems in Relation to Oral Health was the official name of this landmark study. It encompassed 30,000

child and adult consumers in cohorts aged 8-9, 13-14, and 35-44 years, as well as at least 100 dental care providers in each of 10 countries representing western and eastern Europe, Australia, and Asia. Countries were selected to allow for representation of dental delivery systems reflecting private practice models embedded in different social contexts (e.g., US and Australia), community-based models found in eastern and northern Europe, and mixed models that provided for dental care for children coupled with systems that did or did not compensate for adult dental care delivered by dentists and/or paraprofessionals. It is well beyond the scope of this homily to a pioneering social scientist to provide scientific data from this landmark study (and landmark achievement) accomplished through the guidance, abilities, and wisdom of Lois Cohen and her colleagues around the world. The interested reader is referred to publications referenced below. Suffice it to say that the study was so successful—that is, results were both so useful and so important to dentistry's clinical, biologic, behavioral, social, and public health scientists and administrators—as to warrant a second international collaborative study, paralleling the first but extending the ages of the study cohorts to include adults aged 65-74 years. Today, WHO and teams of scientists in all the participating nations are utilizing and adopting the methods of these studies to refine and improve the oral health systems in their respective domains.

### The impact of social science research

The quality of Lois' socio-dental research was a major factor influencing its contribution to all levels of the worldwide dental community. As with all good scientists, methodologic considerations were paramount, and Lois developed and perfected methods for conducting social science research that influenced other fields as well. Within dentistry, bringing sophisticated research methods to surveys of the dental profession increased response rates from 15% for typical surveys of health professionals to response rates of over 80% beginning in the decade of the '60s. Research on resistance to incorporating new scientific information among health professionals led to successful strategies to increase the use of topical fluorides and dental sealants by the private practice dental community. Educational research identified the characteristics of those seeking to become dentists as upwardly mobile and emerging from the middle and lower strata of our society, and introduced educational methodologies based on such research previously neglected by dental educators, including, for example, the established efficacy of incorporating behavioral objectives into dental curricula, and evidence-based methods for establishing that dental paraprofessionals could be trained to perform certain clinical tasks previously restricted to dentists and to perform at levels of skill indistinguishable from those of their dentist-teachers.

Health education research on children and adults contributed to the validation of earlier-developed health-belief models which became focal points for medical as well as dental research, inquiring into what motivates people to

go to the dentist and what influences their belief about the potency of dental disease and the efficacy of treatment. Research conducted on children demonstrated the pre-potent role that behavior of the mother had on influencing the child's dental behavior. Lois' research with Jeannette Rayner showed, for example, that with regard to producing a compliant child dental patient, the mother's dental behaviors were directly related to the child's ability to accept dental care. These lines of research, converging with related efforts from other social scientists taking their lead in dentistry from Lois' work, demonstrated that dental behavior could be studied systematically and that socio-cultural determinants of dental behavior—dietary preferences, oral hygiene practices, culture-bound belief systems, economic factors—were as potent as disease-based mechanisms in explaining the prevalence of dental and oral diseases and responses to treatment. In summary, for almost four decades, Lois has led the way, as researcher and more recently as research administrator, in showing how broad-based and multi-disciplinary socio-dental research can contribute to enhancing quality of life threatened by emerging or chronic dental and orofacial conditions.

### The move to NIDR

It is important to point out that Lois' accomplishments were being duly noted by the USPHS, and Lois received continued professional recognition for her efforts. Lois became increasingly interested in dental health administration during this time, and her career took an important turn in 1976, when she came to NIDR (now NIDCR) as Special Assistant to the Director and Planning Officer, working directly with NIDR's new Director, Dr. David Scott. It is generally not well-known that while biologic, clinical, and materials science research had been formally supported by NIDR from its beginnings in 1948, it was not until a generation later, in 1974, that NIDR formally instituted support for behavioral and social science research.

Thus, Lois' arrival at NIDR in 1976 was of utmost significance, for she was charged with building an apparatus at NIDR to support behavioral and social science research beyond those early efforts two years earlier. She supported the already established intramural research efforts in pain research and expanded the extramural program which would establish NIDR as the leading NIH institute for all aspects of pain research. Her natural administrative proclivities led her to become the chief planning and evaluation officer for NIDR, and she undertook critically appraised evaluations of NIDR's national research programs related to dental caries, craniofacial anomalies and dysfunction, dental biomaterials, and, of course, multidisciplinary pain research. As planning officer, she led the Institute's initiatives which produced two long-range research plans: for the '80s and again for the '90s. Lois then went on to be Associate Director of NIDR, responsible for the world-class extramural research program of the NIDR, and eagerly undertook special responsibilities for international collaborative research, a responsibility she both continues to hold and continues to cherish to the present. During those

particular nine years, the Division of Extramural Research nearly doubled its investment, administered by a lean and bright staff of extramural scientists and managers. It leveraged resources which were "capped" by cost-containment policies with complementary resources from other public and private sectors and globalized the portfolio of science to strengthen the national capacity to work with international science experts. Not bad for a non-dentist-sociologist young woman from Philadelphia.

### ...and IADR

Lois brought to dentistry's most important organization of researchers around the world, the International Association for Dental Research (IADR), the same energy, high scientific standards, and indefatigable commitment to making dentistry a better profession by expanding its research horizons into the behavioral, social, public health, and health services research arena. She tirelessly worked to create and keep alive a fledgling behavioral sciences and health services research group (BSHSR) of the IADR, which included, at its inception in the late 1960s, Lois and (literally) about six or seven other social scientists. The BSHSR Group of the IADR now has hundreds of registered members, making it one of the larger Groups within IADR, and again, Lois started it all and nurtured it until BSHSR could make its own way. She has been honored by BSHSR on many occasions and in different ways—she has served as its President and has been the Group's Councilor to IADR for many years, and was the first recipient of its Distinguished Senior Scientist Award as well as recipient of the IADR Distinguished Scientist Award.

### Summary

The role that Lois played at the NIDR and the IADR as an advocate for biopsychosocial research in dentistry cannot be underestimated and remains one of her most cherished and lasting legacies. First, she has steadfastly maintained her vision for dentistry as a major health discipline that continues to mature toward acceptance of responsibility for

every aspect of the impact that oral disease could have on the health and welfare of its patients. Next, she has been an exemplary role model as a rigorous social scientist, simultaneously advocating that such research be interdisciplinary and collaborative while reflecting only the highest standards of excellence for research from the social, biologic, and clinical sciences. Through her administrative leadership skills, she has encouraged such a research mission to be incorporated into the long-range planning of the NIDCR, IADR, FDI, and ADA.

Such is the esteem in which she is held that respected social scientists have been attracted to dentistry, persuaded by her vision and drawn by her science. For several decades, thanks to Lois as the primary role model, these scientists have been able to develop their own careers and research interests while bringing cadres of new scientists similarly committed to the broadest and deepest understanding of dental and orofacial growth and development and the prevention and management of dental and orofacial conditions as those processes emerge in peoples around the world.

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