

# **DEMOGRAPHIC DESTINIES**

## **Interviews with Presidents of the Population Association of America**

### **Interview with Christine Bachrach PAA President in 2013**



This series of interviews with Past PAA Presidents was initiated by Anders Lunde  
(PAA Historian, 1973 to 1982)

And continued by Jean van der Tak (PAA Historian, 1982 to 1994)

And then by John R. Weeks (PAA Historian, 1994 to present)

With the collaboration of the following members of the PAA History Committee:  
David Heer (2004 to 2007), Paul Demeny (2004 to 2012), Dennis Hodgson (2004 to  
present), Deborah McFarlane (2004 to 2018), Karen Hardee (2010 to present), Emily  
Merchant (2016 to present), and Win Brown (2018 to present)

## **CHRISTINE BACHRACH**

PAA President in 2013 (No. 76). Interviewed by John Weeks at the offices of Esquire Deposition Solutions, San Diego, CA, May 7, 2013

**CAREER HIGHLIGHTS:** Christine Bachrach was born in 1950 and grew up in New York. She received her BA in Social Relations at Harvard in 1972, her MA in Sociology (Demography) at Georgetown University in 1974, and her PhD in Population Dynamics from The Johns Hopkins University in 1979. From 1979 to 1988 she was a Statistician/Demographer in the Family Growth Survey Branch of the National Center for Health Statistics (NCHS) in Washington, DC. In 1988 she moved to the National Institute of Child Health and Human Development (NICHD), where she rose to the position of Chief of the Demographic and Behavioral Sciences Branch, and then to Acting Associate Director of NIH for Behavioral and Social Sciences Research from 2008 until she left government service in 2010. Dr. Bachrach is currently Research Professor in the Department of Sociology at the University of Maryland, College Park.

**WEEKS:** We're in San Diego, California, interviewing Dr. Christine Bachrach, current president of the Population Association of America. This is actually the very first time that we've interviewed the sitting president because, of course, it's the PAA President Oral History Project, and we normally capture you guys after you've stepped down. But it's nice serendipity that you were in town. Another new thing, today, is doing the interview at a court reporter's office, where we've got—

**BACHRACH:** I'm innocent.

**WEEKS:** Yeah, I know you are. Well, you're not really innocent, you're guilty of having a long and productive life as a demographer, and that's what we want to talk about today. So let's go back to, say, your undergraduate degree, your undergraduate years at Harvard. From that basis, how did you wind up becoming a demographer?

**BACHRACH:** I found demography in my senior year at Harvard. David Heer was teaching a course in demography. And I had been a social relations major studying Freudian psychology, and by my junior year had decided that it was not for me. So I finished up my requirements and spent my senior year exploring the world, and I found demography and immediately fell in love with it. It was also the sexual revolution that led me to demography, because during my years at Harvard I volunteered for Planned Parenthood. When I took a course in demography, I discovered you could study fertility and family planning, and studying fertility has turned out to be my lifelong passion. So I was hooked.

**WEEKS:** Okay. So you were hooked there with the course from David Heer—

**BACHRACH:** Right.

**WEEKS:**—at Harvard.

**BACHRACH:** And when I left Harvard I was determined I was not going to continue in school. I was done with school. It was enough. I at least needed a break. So I wrote to every place in Washington, D.C., that did population work, asking for a job. I got a letter from Phyllis Piotrow, who was the head of the Population Crisis Committee at that point, telling me that I should go for a Ph.D. And I got an offer of a secretary job from a man in a federal office who told me that college gals make great secretaries.

**WEEKS:** Oh, okay.

**BACHRACH:** Eventually I found out that I could have a work study job at USAID if I enrolled in a graduate program. So very reluctantly I enrolled in the Georgetown Masters' program in demography so that I could have a job in the population field. And from there I got involved with working with Jeanne Ridley on her study of the low fertility cohorts of 1900 to 1910. In the course of this someone convinced me that I had to go on and get a Ph.D., so I went to Hopkins and finished my training there.

**WEEKS:** Let's step back for just a second, because you have been in Washington, D.C., most of your life—

**BACHRACH:** Yes.

**WEEKS:**—except for that brief period up in the Boston area. Did you grow up in Washington, D.C.?

**BACHRACH:** I did not. I grew up outside New York. The reason I was drawn down to Washington, D.C., was that I married right after college.

**WEEKS:** Okay.

**BACHRACH:** And my husband was at Georgetown, in law school. So Washington was the area to go to, and that's worked out very well because there have been lots of opportunities there.

**WEEKS:** So from Georgetown you went to Hopkins. Why did you choose Hopkins?

**BACHRACH:** I chose Hopkins because of a deal that I made with my husband. He was getting his law degree, and he agreed to apply for jobs in places where I could go to graduate school. So he applied for law jobs in Ann Arbor, Michigan, the Wisconsin area, the Princeton area, and Baltimore. And I said, "I'll go wherever you get your job," and he got his job in Baltimore. So that's where we ended up. And that was probably pivotal, because that allowed me to continue to stay close to the many opportunities for population science in the federal government. Now there's one other detail about my life that's very significant that I need to bring in here, and that is that every department that has ever granted me a degree is now defunct.

**WEEKS:** Oh dear.

**BACHRACH:** Yes.

**WEEKS:** Just a coincidence, I hope.

**BACHRACH:** Hard to tell. Actually, some of them have just changed names, but I think that that's a unique distinction.

**WEEKS:** That's true. It's now sociology at Harvard, isn't it?

**BACHRACH:** It's sociology at Harvard. The Georgetown program closed down. And Hopkins changed its name from Population Dynamics to Population, Family, and Reproductive Health.

**WEEKS:** So who did you work with mainly at Hopkins?

**BACHRACH:** Jack Kantner was my advisor. Andy Cherlin came in just as I was writing my dissertation and became a member of my dissertation committee. Lois Verbrugge and Rafe Stolzenberg were there. It was a good group.

**WEEKS:** Your focus was on fertility and contraception issues. Tell us about your doctoral dissertation.

**BACHRACH:** My doctoral dissertation was a spinoff from my work with Jeanne Ridley. I had planned to use her data to look at the consequences of childlessness for social isolation in old age. As it turned out, her data weren't going to be available in time, and so I located some data—it was a Harris survey—and I did the same analysis. It was an exercise in efficiency to produce the document that would get me my degree and get me moving on my life again.

**WEEKS:** So you didn't see that necessarily as part of a research agenda?

**BACHRACH:** No, I never have been an aging person—speaking of scholarship, of course! My interest has always been in fertility. It was a very convenient, well-defined topic, and I just did it. When I got into the next stage of my life, I started going back into more work on fertility.

**WEEKS:** Well, yes, because it seems to me that the things that you've done since then are more in line with what Jack Kantner and Andy Cherlin, for example, have done.

**BACHRACH:** Right. And it was very much in line with what Jeanne Ridley was doing. And in fact, she was probably my major advisor during graduate school, because I worked for her the entire time up until the last year before I finished my dissertation, and working very intensively on the study that she was doing.

**WEEKS:** Going back to your time at USAID, when you were at Georgetown—now, what were you doing with them?

**BACHRACH:** I remember that we were in the beginning stages of thinking about the World Fertility Surveys. I remember that Ray Ravenholt, who was the head of the office, was a very controversial figure. But to be honest, I don't remember the specifics of what I did there.

**WEEKS:** All right. And so you finish up your doctorate, and what were your expectations?

**BACHRACH:** I decided I didn't want an academic job. I had seen a number of situations where women had been badly treated by academic departments. I didn't particularly want to teach at that point. And I also knew I wanted to have a family, and wanted to have a job that would allow me to enjoy my children. I enjoyed research and wanted to be good at it, but I didn't have great ambitions. So I looked at all the opportunities in Washington, D.C., and said, "I'm going to do something there." And I started interviewing with people and everyone said, "No, we only hire full-time." So I waited. After a month or so, a couple of the places that I had interviewed with said, "Come back—we'll hire you part-time."

I ended up taking a permanent part-time position at the National Center for Health Statistics, working on the National Survey of Family Growth. It was a very exciting time, when we were moving from having the survey cover only ever-married women and never-married women who had actually had children, to covering women of all marital statuses in the reproductive ages. We were finally recognizing, thanks in part to Jack Kantner and his colleagues, that many of those never-married women who hadn't had children yet were still having sex, and that we needed to understand how they

were avoiding pregnancy. That was a very exciting design issue, how do you move the survey from one to the other, maintaining some kind of comparability, but providing the information we needed on the single population as well. So it was a very good experience.

**WEEKS:** And were you successful in starting your family during this period of time?

**BACHRACH:** I was. I had two sons. The first one was born before I actually took the job. The second one was born about three years later.

**WEEKS:** And anticipating later questions, were these intentional pregnancies?

**BACHRACH:** Yes, they were.

**WEEKS:** Okay. So how did you get from the National Center for Health Statistics [NCHS], eventually, to NIH [National Institutes of Health]?

**BACHRACH:** Well, I'll tell you, it was because of a heart attack and thunderstorms that shut down the Atlanta airport.

**WEEKS:** Okay. That's a good story.

**BACHRACH:** When I had been at NCHS for about nine years, my husband had a heart attack, and I was scheduled to go down to the PAA meetings in New Orleans. It was my first discussant role. And I was very excited about this, because the people whose papers I was discussing were real leaders in the field, doing ground-breaking work on cohabitation. It was Bob Michael [University of Chicago], Sandy Hofferth [NICHD], Arland Thornton [University of Michigan--and PAA President in 2001], Robert Willis [University of Chicago], and Larry Bumpass [University of Wisconsin--and PAA President in 1990]. So I asked my sister-in-law to stay with my husband for a day at the hospital while I flew down to New Orleans and did my discussion. After it was over I got right back on the plane and started home. Well, we got stranded in Atlanta because of thunderstorms. And the people I was stranded with happened to be Jeff Evans, Sandy Hofferth, and Virginia Cain, three members of the NICHD's [National Institute of Child Health and Human Development] Demographic and Behavioral Sciences Branch [DBSB]. So we had a jolly time sitting in the Atlanta airport talking about science and getting to know each other. And within a couple of weeks I got a phone call from Wendy Baldwin, who was the chief of the office at that time, saying, "Do you want to come over and work with us?" And I am sure it was because of those thunderstorms.

**WEEKS:** That is an interesting set of happenstances. And so they invited you over and—

**BACHRACH:** They invited me over, and I gave a lot of thought to whether or not I wanted to go from producing science to overseeing science. We had many opportunities to do research at NCHS, not just producing descriptive reports, but also writing and publishing journal articles. In the end I decided that it was a great opportunity, but it was a difficult adjustment. I found a little cartoon of a man standing right behind a plumber who was holding a wrench. The caption of the cartoon said, "If you stand real close and ask lots of questions, it's almost like doing it yourself." And that's more or less what it was like at NICHD. It was a very, very different kind of work to be doing, but it enabled you to think big, to think broad, to get to know everyone in the field, which was just delightful.

**WEEKS:** Well, tell us a little bit more about that, because most of us only see it from the outside perspective. So what's it like to be on the inside? Because there aren't really that many people in the demographic field who have been in the NIH.

**BACHRACH:** I always used to describe the job as involving work at three levels. The first level is just the get-it-done level. You've got reviews to attend, you've got applicants to talk to, you've got progress reports to review, you've got funding recommendations to write up. There's an enormous amount of routine work that needs to get done. That's the bottom line. You learn how to do it, you do it. Some of that was very rewarding, especially working with applicants, unless of course you had to tell people that they didn't have a chance at getting funded.

And then at another level there was the work of leading or facilitating science. I never felt that I should be telling people where the science should go. Someone once came up to me and said, "Well, you know, you can just tell us to do research this or that way and we'll follow because you have the money." I said, "Why would you think I would want to do that?" The challenge as I saw it was following the lead of our best thinkers to identify promising directions or opportunities and help them become reality. This could involve developing new initiatives backed with funding or it could involve working with applicants who wanted to do exciting things, connecting them with other people in the scientific community, helping them get their science going.

**WEEKS:** Well, and I think everybody has the belief that, since NIH funds so much of demographic research, that the places where NIH puts an emphasis, particularly NICHD, puts an emphasis, is going to drive the field.

**BACHRACH:** It does.

**WEEKS:** Did you feel that way?

**BACHRACH:** Oh, absolutely.

**WEEKS:** Okay.

**BACHRACH:** My predecessor, Wendy Baldwin, promoted the idea of adding a child development piece to the National Longitudinal Survey of Youth. And that sowed the seeds for the development of an interdisciplinary research agenda in which demography reached out to developmental psychology and family scientists to get a better understanding the roots of healthy child development and the importance of family change in this. And that became a very exciting part of the field for many, many years. It's one way in which our Branch and NICHD made a big difference.

Add Health [National Longitudinal Study of Adolescent Health] was another example. I think that study has helped to bring demography closer to health. I started asking people about how demography could contribute to health research early in my tenure as Branch Chief, in one of the strategic planning exercises we did with members of the field. But no one came up with good ideas. I got blank looks back then. But now health has taken over the PAA program. There are more papers submitted on health than on any other topic. So there's no question that the program has an influence. But the influence has to be harnessed to real opportunities in the field that people can get behind. That's why I always felt it was best to lead by following. And I think people appreciated that.

Then the third level at which one has to work at the NIH is the level of the bureaucracy. DBSB, now Population Dynamics, was one branch out of many at NICHD, and we needed to be effective players in the Institute to keep our funding levels strong. This required good strategy, teamwork and

the ability to translate back and forth from the way we think in demography to the way that the NIH leadership thinks, and learn how to pitch what we needed in terms they could appreciate.

**WEEKS:** Okay. Now you, over time, kept moving up through the organization.

**BACHRACH:** Yes. I became the chief of the branch pretty early in my time at NICHD. I stayed in that position for 16 years, which is as long as anybody should have the authority to oversee a funding program.

**WEEKS:** What's the difference, in terms of being the chief as opposed to being a program officer, per se?

**BACHRACH:** Being the chief is the best job at the NIH, or at least it was when I was there. You have a certain amount of autonomy, you have the ability and the legitimacy to make connections across different groups, and you get to work with a terrific staff, which I had, and enjoy helping them be as productive as possible.

**WEEKS:** Were you the kind of person who gives autonomy to your staff, or—

**BACHRACH:** I thought I was. There were times when I put the brakes on people, or tried to shape their ideas, but we had a great staff and I hope I gave them enough autonomy to get great things done. They certainly accomplished a lot.

The other job that the chief has chief responsibility for is managing the optics of the Branch's position within the institute, which related to that third level of work I talked about. One challenge was getting the most resources you could for your branch without drawing the ire of other branches. When I took over the branch we were getting about 6 percent of the Institute's research funding, but we increased that to almost 10 percent. I was always glad that we never stayed above the 10 percent mark for long. It might have made us vulnerable.

Another aspect of Institute politics was promoting the behavioral and social sciences. NICHD had other programs that dealt with the behavioral and social sciences but for most of the time there was no one in a leadership position at the institute who came from a behavioral or social science background. So there was great potential for joint efforts with other branches, but making those actually happen was quite challenging at times.

**WEEKS:** Turf wars?

**BACHRACH:** At times. But ultimately we broke through the turf mentality, and when we did that the social sciences became more powerful at the NICHD than they had been. We were also very fortunate to have Duane Alexander, who was a pediatrician, but who had an appreciation for what we were doing and was incredibly supportive of our branch. I think our field owes him an enormous debt of gratitude.

**WEEKS:** Okay. So now you've got the branch chiefs within each one of the institutes, but the institutes themselves compete with one another for overall funding. Is that correct or not so much?

**BACHRACH:** Not so much.

**WEEKS:** Okay.

**BACHRACH:** The institute budgets tend to have momentum behind them. In some instances, there might be a particular thing that Congress wants the NIH to do, and they may say, “We’re going to give a large chunk to this institute and not that.” So for example, they did that with the National Children’s Study. At least initially, Congress gave the money for it to the NICHD. Later the money was funneled through the NIH director’s office. But competition among the different institutes is less of an issue, at least at the program level. On the other hand, collaboration among programs in different institutes can offer opportunities, and that relates to my life after NICHD, when I spent two years as the acting director of the Office of Behavioral and Social Sciences Research at the NIH, which was wonderful in many ways. What I tried to do in that position was focus on the behavioral and social science community at NIH and try to get them working together more effectively.

**WEEKS:** Now, explain that particular office in relationship to the other things that go on.

**BACHRACH:** The office was created by Congress in 1995 because there were people in Congress who felt that behavior was very important for health.

**WEEKS:** Good.

**BACHRACH:** And that NIH wasn’t particularly attuned to that. So Congress required that a coordinating office be created in the office of the director of the NIH in order to represent and advocate for behavioral and social science at the NIH. And it’s always been a challenging role, because the leadership at the NIH remains very focused on biomedicine. They recognize that behavior is important, but it’s a different kind of science, one that can’t be done entirely with the tools they are used to.

**WEEKS:** Right. Has there been a director of the NIH who has not been a physician? They’ve always been physicians, have they not?

**BACHRACH:** Not entirely, for example I don’t think Harold Varmus was a physician, but the directors tend to be biomedical scientists or physicians, or both. The interests of the NIH leadership are focused on genetics, on organ systems, molecules, cells. Behavior is sometimes viewed as just common sense, not the subject of real science.

**WEEKS:** Coming back to this idea of members of Congress pushing this, I guess members of Congress didn’t come up with this spontaneously.

**BACHRACH:** Probably not.

**WEEKS:** From what community did these ideas come?

**BACHRACH:** There is an active advocacy community around behavioral and social sciences in Washington, D.C. The Consortium of Social Science Associations [COSSA] is at the heart of it. The Association for Psychological Sciences, which tends to work independently of COSSA, has also been an aggressive and effective voice. They have been “educating” Congress for a long time, and I think that many groups worked together to get OBSSR [Office of Behavioral and Social Science Research], created. This was before I became deeply involved in behavioral and social science issues at the NIH level.

One example of their influence was their success in getting members of Congress to ask the NIH to support basic behavioral and social sciences research. During my tenure at OBSSR there was this pressure to do something to show that NIH was responding to Congress’s queries on this issue. We did endless reviews of basic behavioral and social sciences at the NIH and ultimately, under Raynard



Kington, who was acting director of NIH at the time, we launched a major funding initiative for basic behavioral and social sciences research. So the advocates did have an effect.

**WEEKS:** And your role in that office is to coordinate and advocate, or—

**BACHRACH:** Yes.

**WEEKS:** Because there's no real money that flows through there, right?

**BACHRACH:** The office has enough money to play an effective role. My approach was to get things done quietly by using the money we had to leverage other funding from the Institutes. We stayed under the radar screen but still managed to provide a great deal of support to the behavioral and social sciences at NIH.

For example, we issued a program announcement on health disparities – a very common and unremarkable action in the NIH context. The work on this began before I went to OBSSR. It was a collaboration among many behavioral and social scientists from many institutes. At that time, it was clear that the then National Center for Minority Health and Health Disparities was mainly interested in training minority doctors. We felt that this left out a great deal of needed science, especially with respect to the behavioral and social mechanisms that create disparities. And so we had a conference that highlighted the relevant science, we followed it with a program announcement, and the Office of Behavioral and Social Sciences Research promised to use three million dollars a year to co-fund the grants that were funded by the Institutes as a result of the announcement—a drop in the bucket, in NIH terms.

**WEEKS:** Right.

**BACHRACH:** By the time I left OBSSR, the institutes had committed about 125 million dollars' worth of health disparities research in the behavioral and social sciences as a result of this announcement, and they've committed more since then. The office managed this just by using the lever of three million dollars in co-funding. And the institutes provided the rest of the money. If we had asked them to spend that money up front on health disparities research, they would have said no. But that's the way the NIH is. You can use the systems that are in place, the mechanisms that are in place to get things done, and that's a fun part of it.

**WEEKS:** Okay. And was that your last position before you left NIH?

**BACHRACH:** Yes, it was.

**WEEKS:** And why did you leave NIH?

**BACHRACH:** I left NIH because after many years of science administration, I had some interests I wanted to pursue. I had gotten very involved in the field of population health, which I haven't talked about at all so far. And I had also gotten very interested in exploring whether we could develop a more scientific way of thinking about culture, and bringing that into our models in demography, because culture makes a big difference in how people behave. And I realized that, because I had stayed with the old retirement system with the federal government, I could leave the NIH when I was 59 with a federal pension, and leverage that to pursue my interests. I realized I had this opportunity about three years before I was eligible to retire, and felt, that is an offer I can't refuse. So I took the acting position at OBSSR, in part recognizing that I was about to make a transition out of the NIH.

**WEEKS:** Okay. So now, tell me about population health, because since you left NIH, you've been on the road with that, I guess, as a focus. Is that right?

**BACHRACH:** With that and with my interest in culture.

**WEEKS:** Exactly. And we should just note for the record that people can read your presidential address focused on the topic of culture in *Demography*. [Note: it is appended to this interview.]

**BACHRACH:** Right. So, back to population health. I had started asking people about how could demography do more in the health area early on, because I recognized that, at some point, Duane Alexander was not going to be the head of NICHD and we might well be questioned, what are all of these studies on fertility and migration and family structure—why are we funding these? And so I began to explore that, but I really didn't know much, which was kind of funny. Both of my parents were physicians, and I had a degree from a school of public health, but my focus had always been demography, not health.

But that changed. I got a call from the then director of the Office of Behavioral and Social Sciences Research, Norman Anderson, who asked me to co-lead a trans-NIH conference on social and cultural factors in health. I said, "I don't know anything about health." He said, "You'll learn." So David Takeuchi and I co-led the conference, and it led me to this field of population health, which seeks to understand health from a very interdisciplinary perspective.

And soon after this conference happened, I got involved in the Robert Wood Johnson Foundation Health and Society Scholars program, which has a strong focus on health at the population, not the individual, level, and on all of the different factors, from cells to society, from health care to the built environment, all of the things that affect a population's health. What they do in this program is they bring in really talented young people post-Ph.D., and give them two years of protected time to explore interdisciplinary scholarship. It's a wonderful program. I was on their national advisory committee for quite a few years, and was about to have to go off the committee because my term was up. But the job of co-directing the program came open, and I took it in order to stay on with the program.

**WEEKS:** Okay, so that's how that happened.

**BACHRACH:** I especially took to the idea of population health because of my experience at NIH, and especially in the Office of Behavioral and Social Sciences Research. The culture at NIH is all about finding cures for diseases, new pills, new technologies, and the evidence suggests that the effect of those things on the health of the population is relatively modest. It makes a difference, but what makes a much larger difference are the conditions of people's lives and their behaviors—the things that make people sick in the first place.

**WEEKS:** So how do you bring your background in family to that issue?

**BACHRACH:** There are connections, certainly, but I don't think we understand them that well. We are social beings and that has implications for health. If you isolate somebody entirely, they're not going to be healthy.

**WEEKS:** Right.

**BACHRACH:** Because we are social beings, we are biologically sensitive to our social interactions and environments. People's family experiences affect health because they're affecting our biology. When kids are abused in families, they are physically and psychologically changed in ways that are

very unhealthy for them. So pursuing those issues of how these family interactions get under the skin, and how other kinds of interpersonal interactions get under the skin, is part of population health. I'm not actively carrying on a research agenda in this field. I see my role as more of a continuation of what I did at NIH, of leadership and facilitation. I also think a lot about how to promote the message that Americans need to think differently about health: perhaps we're too focused on health care and not enough focused on how to structure our world in ways that will keep us healthier longer so we don't need medical care.

**WEEKS:** So how did that, then, feed into the time you spent at Duke?

**BACHRACH:** It didn't. It was the interest in working in the cultural arena that led me to go down to Duke.

**WEEKS:** Okay.

**BACHRACH:** When I looked around at the various places within reach of where I lived and thought, who would I like to work with, I thought of Linda Burton, Phil Morgan, Jim Moody, who is not a demographer, but a sociologist and also another non-demographer, Naomi Quinn, who is a cognitive anthropologist, and I said, "I want to spend some time down there and sit at these people's feet." So I left the NIH and basically went back to grad school to learn new things, but this time I didn't pay tuition and I didn't have to take exams.

**WEEKS:** Did you actually stay down there or you just flew down to—

**BACHRACH:** It varied. The first year Phil Morgan generously gave me funding to go down and spend three days every other week at Duke's Social Science Research Institute. After that first year I was offered a visiting professorship that was joint between Duke and UNC, and I lived down there for a semester. I taught a course in health disparities and just loved it. After that my travel to Duke tapered off a little bit, especially once I got into the work associated with the PAA presidency. But I learned—I'm still learning—a lot from the people down there.

My interest has been in trying to make the connection between what we know about the brain and how our brain learns culture. How do we learn how elements in the world around us should be construed, how different behaviors are to be construed, what's appropriate to do in various situations? How do our brains keep and manage all this information, and use it to help us navigate in the world? And then, can understanding these mechanisms help us, as scientists, model culture and its expression in the world?

**WEEKS:** So have you been behind this push that the Obama administration has made on brain research that Francis Collins [director of the National Institutes of Health] is promoting?

**BACHRACH:** I have not been behind it, and I believe their interests are pretty far afield from what I'm talking about.

**WEEKS:** Okay.

**BACHRACH:** Although they do seem to have some interest in social neuroscience, and that's a step in the direction that I'm focused on.

**WEEKS:** Okay.

**BACHRACH:** But, you know, most of the work in the brain so far has been on brain process, because that's what you can observe, in imaging techniques. It hasn't been on brain content, the information that people actually carry around with them in their brains. And of course, both are important.

**WEEKS:** Okay. And so now you're at Maryland. How did that transpire?

**BACHRACH:** I started up a connection with Maryland early on. I met with Sandy Hofferth and she invited me to develop a courtesy appointment with the Maryland Center for Population Research, so when I wasn't down at Duke, I would come down to Maryland and go to seminars and meet with people. When I got the invitation to run for the presidency of PAA, I had to call around to different population centers and say, "If I were elected president, would somebody actually support me in doing this?" Because the job requires some administrative support. And Maryland said yes, so that really solidified the relationship there. And since that time, I've become a research professor in sociology as well.

**WEEKS:** Good. And getting to the PAA now, you're not just president, you've been very involved in a variety of ways over the years. And you've been in a position to help shape the direction of the field. How do you see, over the course of your career, that the PAA and the field have changed? Or have they, in your mind?

**BACHRACH:** I think in some ways we haven't changed that much. We're still a modest-sized organization which for many of us has provided a warm and supportive professional home. On the other hand, our field has experienced some very important changes that have enriched it greatly. What's happened is that we've been willing to move away from the core of demography—migration and fertility and mortality and a focus on data and numbers and getting things right with our methods, which are still very important—to being expansionary and—

**WEEKS:** Expansionary. Define that term for me.

**BACHRACH:** Okay. Stretching out to get involved in topics that belong to other fields. So, for example, we moved into the area of child development for a while. We developed collaborations there. And we developed a whole cadre of people who know child development and the family and demographic methods, and created a little subfield that became very productive. In the '90s anthropological demography got a lot of attention and brought in notions of culture and qualitative methods, which were less a part of demography early on. We're being expansionary with health now. PAA is the professional meeting that most of the RWJF Health and Society Scholars go to at this point. We had people presenting at PAA this year, and health was the largest topic on the program for the first time ever. I think that it would probably not be good for PAA to be *overrun* by health, but the marriage of demography and the more health-related concerns of epidemiology and basic biology and neuroscience has created a very productive and exciting dynamic, and so I think that PAA is enriched by this happening. It has also helped PAA become more interdisciplinary. We've also gone from being more about the numbers and what is happening to trying to understand what's happening, and I find that very exciting.

**WEEKS:** Do you think that there has been more of a blending, say, of demography and public health? I mean, coming out of Hopkins, where you've got strong sociology but also a very powerful school of public health, were you involved in both of those programs, or—

**BACHRACH:** You know, there's a bit of a gulf between public health and demography. One way that is expressed is in the orientation towards action. In demography, for better or worse, we are all about

our science, and somewhat conservative when it comes to trying to change the world. We may have concerns about policy issues and making life better for people, but what comes first on our plate is to do good science. And then if you have good enough science, that can inform these larger goals. In public health, there's more emphasis on action, at least that's my perspective, and I'm sure it is way too black and white. But I do think that there's a gulf there.

It comes up constantly when I see people interacting at meetings within Health and Society Scholars. At what point do you move research to policy or practice? Is it when you have something that you think works, deep in your heart, and for which you have some supportive data, or is it much later, when you've got foolproof data that, under many different kinds of circumstances, pulling this lever is going to result in the outcome you want? I don't think we've worked through that very well. It needs more attention.

**WEEKS:** And does the PAA facilitate that kind of activity?

**BACHRACH:** The PAA has been very careful in its public positions. And I'm sure that you have, in your histories, the reasons behind why we tend to focus primarily on what is relevant to doing our science and not taking these other positions. I think that the PAA has basically staked out its territory, and I'm very comfortable with that.

**WEEKS:** How do you feel about the fact that the Population Association of America is one of the larger academic groups that, by and large, doesn't have home departments back in the universities where most people come from? How do you think that influences what happens in the organization?

**BACHRACH:** I think it's probably good for it. I think it helps to make us effective as an interdisciplinary field. But it also means that we need the infrastructure that ties us together, like the association and the centers programs that NIA [National Institute on Aging] and NICHD fund. We also need the many centers that manage to get along without funding from NIH. We need centers all around the country in order to provide the intellectual homes that help people do their science.

**WEEKS:** Right. When you were at NIH for all those years, were you pushing centers in a particular direction, to do certain kinds of things?

**BACHRACH:** I don't think we pushed the centers to do particular types of science, but we were pushing them to be innovative and strategic. We would have an annual branch retreat when I was at NICHD, and in the mid-1990s, we met once for a retreat at my house. We were going around the table and each person was saying, what is it that we really need to do in the next year? And Jeff Evans spoke up and he said, "We need to revamp the centers program." And I kind of looked at him, because that's exactly what I was going to say. And what we were both feeling was that the funding for the centers needed to be more competitive, because in order for centers to really push the edge of the envelope and keep the field moving, they need competition. So we redesigned the centers program to increase competition, by allowing places that didn't already have funding to get into the mix and compete for funds. And I think that that was very, very productive. Unfortunately, now we're in a situation where funding is being cut back and everyone is struggling and we have way more centers trying to compete for that same shrinking pool. But I still don't have any regrets. I think it was the right thing to do.

**WEEKS:** So, where do you see things going in the field, over the next few years?

**BACHRACH:** I think we're going to keep rolling with health for a while. I think immigration needs to be strong. We didn't get as many submissions to the annual meeting in the immigration area as I would

have hoped, and I think that field needs to grow. I'd like to get us back to thinking about fertility some more. Research in that area seems to be dormant—

**WEEKS:** In the U.S. or globally?

**BACHRACH:** In the U.S.

**WEEKS:** What do you see in terms of the role of NIH funding work that looks outside of the United States, compared to that in the U.S.?

**BACHRACH:** I think it's important. The NICHD and NIA funding for international programs, Richard Suzman's development of aging surveys all over the world—I think all of that is tremendously important. Given the increased tightness of funding, there is always the risk of some kind of backlash at NIH against international research, but it actually happens pretty rarely. The one thing that the NIH system has going for it is that it's only when you are directly giving funds to an institution in another country that grants supporting international research come under close scrutiny. If it's through a subcontract from an American institution, you don't get the scrutiny, so you can more easily fund the research.

**WEEKS:** I thought about that mainly because members of Congress these days seem to be overly concerned about that.

**BACHRACH:** Yes. And that's another part of my job at NICHD I think that's worth talking about. The most challenging and exciting parts of my career have been in the political navigation of attacks on science. I was brought over to the NIH to start working on Add Health when it was still the American Teenage Study, and the attacks on the American Teenage Study and the Adult Sexual Behavior Surveys started very soon after I arrived.

**WEEKS:** Okay.

**BACHRACH:** Thank goodness for Wendy Baldwin who was amazingly good at responding to these attacks. She thrived on stress and she knew how to handle it. I was so green at that point, I didn't have the foggiest idea of what to do, but I learned fast. And that episode had a pretty happy ending. Even though they made the American Teenage Study illegal by an act of Congress, Congress also said that the NICHD must fund a comprehensive study of adolescent health. In debate on the House floor, a conservative member of Congress challenged Pat Schroeder, the liberal member of Congress proposing the language requiring this study, and said, "You're just going to let them ask teenagers those dirty questions about sex," and she said, "Well, of course we are, because sexual behavior is important for health." And so we had the basis for not restricting the content of Add Health when it moved forward. And Add Health has gone on to be a tremendously innovative and important study. So that was a great outcome of a very difficult experience.

Over time we've also had repeated attacks with members of Congress pointing to specific grants, for example, a grant on truck drivers' sexual behavior in Africa. Why on earth is the NIH supporting that? Well, it's because the truck drivers were playing a role in spreading HIV. And it makes sense. They were transporting the virus, having sex with different people in different places. And when those attacks would come, we would have to shut down operations and spend a month justifying everything. Then the furor would die down, until it was time for another political campaign and the possibility of drawing the attention of constituents on hot-button issues, and there would be more attacks. They're still going on, of course.

**WEEKS:** Right.

**BACHRACH:** And more seriously now than ever before, with the attacks on the National Science Foundation.

**WEEKS:** Exactly.

**BACHRACH:** So, one of the things I want to say to future generations, one of the things I think it's important for demographers to know, is that they need to be paying attention to what's happening outside the academy if they want to be able to do their science. And that their actions and their engagement with public affairs activities are very important. It makes a difference. I had no clue that going up on the Hill with a small number of people could make a difference. It doesn't always. Sometimes you're talking to people who are absolutely certain of what they want to do, and no matter how persuasive you are they will go ahead and do what's right for them. But it does make a difference in the long run, because we build relationships, and sometimes it pays off in the short run as well.

**WEEKS:** So how do members of PAA get involved in those roles?

**BACHRACH:** Generally, Mary Jo Hoeksema and Julianne Baron organize annual trips to Capitol Hill. Who goes depends on who is in power on various committees and what the issues are. Mary Jo and Julianne are absolutely fabulous. I think PAA has one of the best public affairs offices and activities of any behavioral and social science organization. But they need help from our members.

**WEEKS:** Okay.

**BACHRACH:** And so when they reach out to you and you are invited to come and talk to your representatives in Congress, it's important to say yes. But you can also get on the action-alert list and respond to action alerts, contact your Congresspeople when something is happening in Congress, and say, this matters for me.

**WEEKS:** Anything else that you can think of that you would like to have included that we haven't covered?

**BACHRACH:** There's one activity that I undertook toward the end of my NICHD career, which was the Explaining Family Change project. And that played a big role in steering my interest in culture. Jenna Johnson-Hanks and Phil Morgan and Hans-Peter Kohler and I collaborated on a volume that—

**WEEKS:** That got published by Springer, I think.

**BACHRACH:** Yes. —that integrated social theory and cognitive science, and tried to apply this integrated theory to fertility and family issues. We had a lot of fun and I was pleased with the result. The project also resulted in more conventionally demographic things, including some new survey projects that extend our notion of family beyond the household. I was very pleased with that the volume, because I feel that demographers need theory. They use theory.

**WEEKS:** Sure.

**BACHRACH:** They just don't necessarily think about it very much. And we've been too reliant on economic theory, which although very strong for many of the analyses we want to do, is limiting for many types of questions.

**WEEKS:** I'm glad you said that. I'll quote you. So is that the line of research, then, that you see for yourself over the next few years?

**BACHRACH:** Yes. I'm in a situation where the research is tugging me one way, population health tugging me another way, and the knowledge of how wonderful it is to take a break now and then tugging me another way. But, yes, that's where I'm heading. At the University of Maryland there's a new activity called a culture lab being developed.

**WEEKS:** Yes.

**BACHRACH:** And I'm planning to get involved with that.

**WEEKS:** Okay, very good. Are you a creator of this, or this is happening—

**BACHRACH:** No, Melissa Milkie created it, but she and I sat down and discovered we have a lot of common interests. So we'll see where that goes.

**WEEKS:** Well, we will, in fact, keep track of that. And I think we actually have passed the allocated time. So thank you very, very much for talking.

**BACHRACH:** Well, it was very pleasurable.

End of interview

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# Culture and Demography: From Reluctant Bedfellows to Committed Partners

Christine A. Bachrach

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**Abstract** Demography and culture have had a long but ambivalent relationship. Cultural influences are widely recognized as important for demographic outcomes but are often “backgrounded” in demographic research. I argue that progress toward a more successful integration is feasible and suggest a network model of culture as a potential tool. The network model bridges both traditional (holistic and institutional) and contemporary (tool kit) models of culture used in the social sciences and offers a simple vocabulary for a diverse set of cultural concepts, such as attitudes, beliefs, and norms, as well as quantitative measures of how culture is organized. The proposed model conceptualizes culture as a nested network of meanings represented by schemas that range in complexity from simple concepts to multifaceted cultural models. I illustrate the potential value of a model using accounts of the cultural changes underpinning the transformation of marriage in the United States and point to developments in the social, cognitive, and computational sciences that could facilitate the application of the model in empirical demographic research.

**Keywords** Culture · Demography · Network · Marriage

## Introduction

In 1996, economists George Akerlof, Janet Yellen, and Lawrence Katz developed a theory to explain the dramatic increase in nonmarital childbearing in the United States. Noting that existing explanations—specifically, welfare incentives and stagnation in men’s wages—could explain only a small portion of the trend, they suggested that the increase in nonmarital childbearing was the result of a “technology shock,” that of the introduction of effective contraception and legal abortion. Their game-theoretic model relied on a standard model of competitive advantage. Women unwilling to use the new measures to prevent pregnancy and birth had to extract a promise of marriage from their

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C. A. Bachrach (✉)  
Maryland Population Research Center & Department of Sociology, University of Maryland, College  
Park, MD, USA  
e-mail: chrisbachrach@gmail.com

partners in exchange for sex—de facto insurance to cover the risk of a pregnancy. Women willing to use contraception and abortion could offer men sex at a lower cost, without the promise. As the proportion of women able to provide sex at the lower cost increased, women who needed to charge more found fewer buyers, pressuring them to agree to the lower price if they wanted to stay in the relationship business. As a result, fewer premarital pregnancies were legitimated, and rates of premarital birth increased (Akerlof et al. 1996).

This is a straightforward economic model, but Akerlof and his colleagues could not avoid using the language of culture in telling their story. They spoke of a “change in sexual customs” and new “expectations” for sexual activity without commitment. More implicitly, they assumed that young men and women *knew* that the Pill had changed the sexual marketplace. How did these young people know this? Not from their own sexual experience, which was limited. Even by 1988, when premarital sexual activity had become a norm of sorts, only a bare majority of teenagers aged 15–19 had ever had sex, and less than one-third of girls and 44 % of boys had had more than one partner (Abma and Sonenstein 2001). Instead, they learned it from their immersion in media and youth cultures that celebrated new models for sexual behavior. Sex didn’t have to be saved for marriage; it was a natural part of love, and the risks could be controlled (Coontz 2005).

Culture has always been important for demography. Malthus (1798/1998) turned to cultural norms and collective values as the basis for “preventive checks” that kept population growth in line. Quetelet (1869:275, quoted in Tyler 1872) attributed regularities in age at marriage to cultural “laws” that were so pervasive that they escaped men’s attention even as they submitted to them. Kingsley Davis rooted his 1939 work on illegitimate childbearing in an institutional model of culture (Davis 1939). Similar models underpinned demographic transition theory (Coale 1973; Notestein 1945). The Caldwells (Caldwell 1976; Caldwell and Caldwell 1987) relied on concepts of culture in their work on African fertility, as did Ron Lesthaeghe and Dirk van de Kaa in their theory of the second demographic transition (Lesthaeghe 1983; Lesthaeghe and Surkyn 1988; van de Kaa 1987). Many PAA presidents, including Larry Bumpass (1990), Etienne van de Walle (1992), Mason (1997), Morgan (2003), and Thornton (2001), drew on cultural concepts and models in their presidential addresses. Even some economists have embraced culture: as Lundberg and Pollak (2007) suggested, culture strongly influences the outcomes of household bargaining.

Demographers *need* culture because as many of my distinguished colleagues have pointed out, culture and material conditions exert interdependent and complementary influence on the behaviors that drive demographic change (Fricke 1997; Hirschman 1994; Lesthaeghe and Surkyn 1988; Pollak and Watkins 1993). It is not structure *or* culture but rather structure *and* culture that affect our outcomes.<sup>1</sup>

At the same time, however, culture and demography have been reluctant bedfellows: like strangers forced to share a room at an inn, they have a necessary but uncomfortable relationship (Kertzer and Fricke 1997). To demographers, definitions of culture often seem vague, variable, and all-encompassing (Obermeyer 1997; Portes 2006). Davis (1963) complained that cultural explanations were both circular and empty: to say that

<sup>1</sup> The term “structure” is used in this context to refer to patterned material and social arrangements, such as economic systems and status hierarchies. This departs from Sewell’s (1992) concept of structure as the dual product of material and ideational elements but is consistent with common usage in demography.

“tradition” causes something is meaningless. Pollak and Watkins (1993) told us that culture fits poorly with rational choice models: one cannot meaningfully model something that supplies both preferences and constraints. Demographic research often tends to background culture, perhaps because our methods provide an awkward fit to its analysis. In demography, we tend to look for the independent causal contributions of autonomous predictors in statistical models. But culture is not a collection of independent variables: as I will argue, it is an interdependent web of meanings that is structured in consequential ways. We can measure and model pieces of it, but our efforts to do so may not fully capture the importance of culture for demographic outcomes.

In this essay, I argue that these conceptual and methodological challenges are tractable and that by embracing them, we can move toward integrating culture more explicitly and meaningfully in demographic analysis. In other words, I argue that culture can stop being demography’s reluctant bedfellow and develop a committed partnership. My argument proceeds in four steps. First, I set the stage by providing a basic definition of culture and a brief review of demographers’ conceptual views of culture and cultural change. Second, I propose a set of criteria for an adequate conceptual model of culture and argue that the models we have fall short in relation to these criteria. Third, I propose a model of culture and develop a case for its adequacy and utility. Fourth and finally, I argue that developments in the social, cognitive, and computational sciences offer the tools to move toward application of the model in demographic research.

## Setting the Stage

Demographers rarely define culture, but when they reference it in their work, they often portray it as a shared set of norms, attitudes, beliefs, and practices (e.g., Carlson et al. 2004; Kalmijn and Tubergen 2010).<sup>2</sup> Anthropologists commonly define culture as a patterned set of meanings shared by a social group or population (Fricke 1997; Geertz 1973; Hannerz 1969). The concept of meaning is essential in both definitions: although norms and practices encompass broader features as well, they depend fundamentally on shared meanings.<sup>3</sup> I begin with the second definition for purposes of this essay and later address how norms, attitudes, and other constructs can be conceptualized in terms that flow from this definition.

Culture is also commonly defined (e.g., Hannerz 1992) as having both a cognitive dimension (e.g., meaning, attitudes, values) and a material dimension (observable practices or objects in the world). In this essay, I focus on the cognitive dimension of culture: the shared meanings given to objects and actions in the world. Both dimensions are necessary to culture, but, again, meaning is fundamental: worldly objects are of interest to cultural analysts primarily for the meanings they carry. It is in this attention to

<sup>2</sup> Some demographers have also used other, less useful, definitions (Hammel 1990): for example, equating culture with a country, region, or group, or the hodge-podge of “fuzzy, not clearly rational, or not readily amenable to inclusion in statistical models” causes of unexplained variance in our models (Obermeyer 1997:817).

<sup>3</sup> For example, the norm of bringing a small gift to a host or hostess rests on a shared interpretation—that the gift is an act of thanks rather than an implication that the hostess is apt to lack some important item the visitor wants. The norm itself—the idea that this is something you *should* do—is the result not only of the shared interpretation but also the widespread enactment of the script and the social processes that assign it value.

meaning, I argue, that demographers have been least successful in integrating culture in their work.

Finally, culture is not just a disordered collection of meanings. It has pattern: it is organized, given a relatively stable *structure*, through specific mechanisms (Fricke 1997; Johnson-Hanks et al. 2011). Its organization is as important as its content in influencing demographic action. For example, culture includes not only the meanings of parenthood and marriage but also how we relate them, and this relation has profound consequences for rates of premarital sex, abortion, and parenthood. The organization of culture also helps to explain why the same actions can take on different meanings in different contexts, why people are drawn to some cultural scripts and not others in particular situations,<sup>4</sup> and why some elements of culture are more vulnerable to change than others.

Developing a useful way of integrating culture in demographic research requires that we answer two sets of questions. The first is how culture is constructed: that is, what elements make up culture, and how are they organized in relation to each other? The second is how culture works: that is, what mechanisms causally link culture to other phenomena, for example, to economic systems or individual behaviors, and what mechanisms produce cultural change? With a traditional focus on variation and change in demographic outcomes, it is no surprise that demographers have largely (and successfully) focused on the latter set of questions when addressing culture. After reviewing demographic views of how culture works, I will move on to a discussion of the first, less explicitly explored question.

### How Does Culture Work?

Prevalent concepts within demography of how culture works have evolved over time. In the mid-twentieth century, most demographers viewed culture as highly stable and subject to change only when exogenous forces disrupted it. Grounded in structural-functional theory, this view conceptualized culture as internally coherent and invariable within the bounds of a society (Hammel 1990; Lockwood 1995). Members of a society were indoctrinated in childhood with cultural beliefs and norms (Ryder 1965) and were generally expected to adhere to cultural norms throughout their lives. Change occurred only when set in motion by substantial changes in economic systems, such as those accompanying economic development (Notestein 1945).<sup>5</sup>

In time, however, as economic drivers alone proved insufficient for explaining fertility declines, many demographers began to think about cultural change in terms of the spread of ideas. For example, Caldwell (1976:352) attributed the nucleation of elite Nigerian families to “the import of a different culture” from the West, and Freedman (1979) suggested that exposure to new cultural models and ideas permitted by literacy, communication, and transportation were playing a significant role in non-Western fertility declines. These accounts emphasized exogenous drivers of cultural change in the form of ideas that were exported from other cultures. In contrast, work on

<sup>4</sup> As an example, Ridgeway (2011) noted that people are more likely to draw on gender beliefs in situations closely associated with gender (e.g., weddings) than in those less closely associated (e.g., work settings).

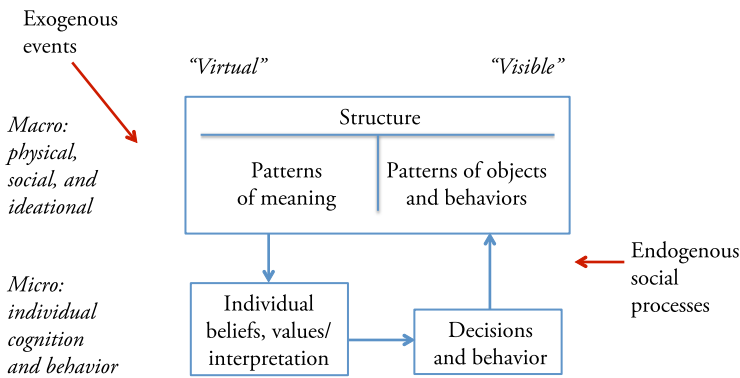
<sup>5</sup> Notestein was so sure of the power of economic structures when he wrote in 1945 that he predicted that it would take totalitarian measures to force U.S. fertility to rise again.

fertility decline in Europe has emphasized the spread of ideas driven jointly by economic circumstances and social structures: the spread of ideas about family limitation and birth control in the first demographic transition (Cleland and Wilson 1987; Coale and Watkins 1986) and the growth of individualism and postmaterialist values in the second (Lesthaeghe 1983; Lesthaeghe and Surkyn 1988).

The influence of this approach within demography increased with work that explored the role of social interaction in the spread of ideas and information (Bongaarts and Watkins 1996; Casterline 2001). Network models of diffusion provided a methodologically sophisticated approach to studying the effects on contraceptive and fertility behaviors of social learning and social influence (Behrman et al. 2002; Kohler et al. 2001) and expanded communications and media (Hornick and McAnany 2001). These new models nevertheless shared a common flaw with earlier work on diffusion: they tended to represent a “fax model” (Carley 2001) in which cultural elements were fixed entities transmitted unchanged across individuals.

More recently, some demographers have emphasized conceptualizations of cultural change that include endogenous processes that shape not only the spread of ideas but also the form that those ideas take as they spread. For example, Johnson-Hanks and her colleagues (2011) argued that individual actors play a crucial role in reshaping both culture and material conditions through their interpretations of and responses to specific situations or events. Bledsoe and her colleagues provided an example of this process in their analysis of Gambian women’s use of local cultural models of reproduction and health to reinterpret the meaning of family planning (Bledsoe et al. 1994). Watkins and her colleagues (Rutenbergh and Watkins 1997; Watkins 2000) have examined the negotiation and redefinition of ideas promoted by Western governments and nongovernmental organizations through clouds of commentary (Hammel 1990), communication, and gossip within local cultures. In his work on developmental idealism, Thornton (2005) also pointed to local transformations of Western family ideals.

This emergent model of cultural change as an endogenous, participatory, and multilevel process has deep roots in sociological and anthropological theory. Figure 1 provides a summary. Cultural change is participatory because group members play an active role in influencing its course. It is multilevel because it involves action at the levels of cognition, individual behavior, social processes, and macro-environments. At the macro level, physical environments and social practices are structured: they tend to have relatively predictable patterns, and these are endowed with socially shared patterns of meaning. People learn these meanings through their engagement with the world and then use what they have learned in interpreting the events and contexts of their everyday lives (Carter 1995; Johnson-Hanks 2007). Their interpretations lead them to act. Sometimes they act habitually, and other times, only after deliberation and conscious choice. Their actions become part of the social environment, where they may reinforce or challenge existing meanings at the macro level (Johnson-Hanks et al. 2011). In this micro/macro model, exogenous events such as the marketing of the Pill or a change in the economic structure can change culture, but this process is mediated by people’s interpretation of new events through existing patterns of meaning (Kertzer 1995). Culture is also changed by endogenous social processes such as social interaction, social movements, and the influence of power, all of which transform individual actions into new cultural landscapes (Watkins 2001).



**Fig. 1** Culture: A participatory and multilevel process. Adapted from Coleman (1990), Johnson-Hanks et al. (2011), and Thornton et al. (2012)

### How Should We Conceptualize Culture?

This dynamic model of how culture *works* is an important advance for demography and the many fields that have contributed to it. However, it has less to say about how culture is *constructed*: it does not tell us what this system of meaning we call “culture” looks like, what it consists of, and how it is structured. Answering this second question is essential if we are going to integrate culture more meaningfully in demographic research.

What would an adequate conceptual model of culture look like? I propose six criteria: (1) an adequate model would build on existing scientific knowledge; (2) it would offer a simple vocabulary that allows us to characterize the elements of culture and capture the full range of cultural phenomena that are relevant to our outcomes; (3) it would specify how culture is constructed and organized; (4) it would be useful at both the micro and macro levels; (5) it would help us visualize and reason about culture; and because demography depends heavily on quantitative models, (6) it would ideally be quantifiable.

In the past, culture has been conceptualized in three general ways, all of which represent important insights and have led to fruitful research but none of which fully meet my criteria for adequacy. The first views culture as a seamless whole in which the parts are interconnected and inseparable from the whole. The second (and more recent) tool kit model of culture presents culture as a collection of values, scripts, skills, and symbols that people may or may not choose to use for strategic ends. The third is an institutional model that portrays culture as organized by institutions that serve societal goals.

The tendency to think of culture holistically, as a “seamless whole” (Caldwell and Caldwell 1987), has characterized much of the scholarly tradition in cultural anthropology (Boas 1940; Geertz 1973). Using terms such as “webs of significance” (Weber 1904/1949, quoted in Geertz 1973), those espousing this view of culture emphasize the interdependence of cultural elements. The basic elements of culture are meanings that are woven together in a sphere apart from the institutional and social to create a “shared background against which and in terms of which social life is carried out” (Fricke 1997:252). This focus on culture as a whole means that when anthropologists analyze particular elements within cultural systems, they see them as deeply embedded in, and

inseparable from, a larger framework of meaning (Bledsoe 2001; LeVine and Scrimshaw 1983). The “seamless whole” model fails my adequacy test because despite the important insight that meanings arise from the interrelations among cultural elements and their place within the whole, it fails to tell us how culture is organized. The model doesn’t adequately allow us to examine the principles that govern how individual cultural elements interrelate and combine to form an integrated whole.

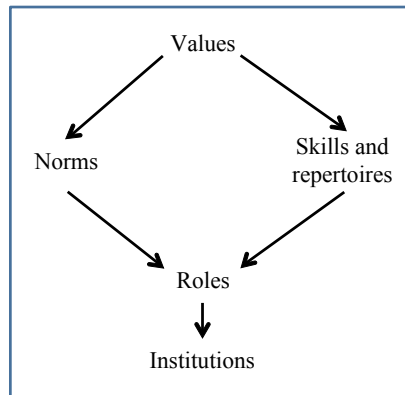
The tool kit model presents culture as an internally inconsistent and incoherently organized collection of values, scripts, skills, and symbols that people deploy for strategic ends (Hannerz 1969; Swidler 2001). In the words of anthropological demographers, culture is “a spice rack of ideas and practices” (Greenhalgh 1988) or “a fluid set of resources people can draw on” (Bledsoe 2001). The tool kit model has been an important advance in conceptualizing culture because it rejects the idea that culture is necessarily internally consistent and coherent and because it endows individuals with the ability to choose among cultural elements to motivate or justify their actions.<sup>6</sup> Few demographers outside of anthropology have explicitly drawn this model into their work (for exceptions, see Cherlin 2009; Harding 2010). However, demographic research that examines variation in attitudes and values implicitly endorses the model’s rejection of cultural homogeneity within a population. Despite its many strengths, the tool kit model fails my adequacy test because it gives little attention to the structure or organization of cultural elements.

Of the three conceptualizations of culture, the institutional model is the one that has most dominated scholarship in demography. In sociology, an institution is “a complex of positions, roles, norms and values lodged in particular types of social structures and organising relatively stable patterns of human activity” related to some societal purpose (Turner 1997:6). Institutions provide a cultural “blueprint” for actual organizations (e.g., schools, markets, and families). As depicted in Fig. 2 (adapted from Portes 2006), this blueprint has a hierarchical structure: roles are grounded in norms for behavior and skills or repertoires needed for the roles, and these are in turn grounded in values, which Portes (2006) defined as “general moral principles.” The institution of the family, for example, organizes roles for mothers, husbands, children, and grandparents and establishes norms and repertoires that guide the performance of these roles. Values such as love, responsibility, and cooperation provide the basis for the entire structure.

Like theories of how culture works, this model has evolved considerably in the last half-century. Demographers of the mid-twentieth century (Davis 1963; Davis and Blake 1956; Notestein 1945) were strongly influenced by the structural-functionalist view that cultures are tightly organized to serve society’s ends, making culture, social structure, and institutions barely distinguishable from one another. As in the seamless whole perspective, cultures were seen as coherent and cohesive, with individual elements reinforcing one another to create a monolithic whole (Lockwood 1995; Watkins 2001). For example, Notestein (1953, quoted in Coale 1973:54) described the

<sup>6</sup> In an example provided by Cherlin (2009), individuals in an unhappy marriage can base a decision to remain married on the cultural belief that marriage should be enduring or choose to divorce following the belief that marriage should be fulfilling.





**Fig. 2** An institutional model of culture. Adapted from Portes (2006)

“arrangements” supporting high fertility as “strongly supported by popular beliefs, formalized in religious doctrine, and enforced by community sanctions. They are deeply woven into the social fabric and are slow to change.” The Caldwells (Caldwell 1976; Caldwell and Caldwell 1987) viewed sub-Saharan African cultures in similar terms.

However, by the time demographers were analyzing the European fertility decline, this notion of a unified coherent culture began to fall apart. The growth of new economic, educational, and social control institutions created an expanded set of domains within which values, norms, and roles could arise, thus expanding the potential for conflicting norms and values across different institutional orders (McNicoll 1980; Thornton et al. 2012). The concept that cultures were dependent on institutional structures was challenged as we entered the second demographic transition. Ron Lesthaeghe and his colleagues attributed the new changes in family behaviors to the spread of postmaterialist cultural models dominated by the growth of a core value, individualism, and desecularization—the lessening control of institutions (mainly the church) over personal behavior (Lesthaeghe and Surkyn 1988). Both individualism and desecularization imply the idea of *freedom* from institutional norms (Cherlin 2009; Preston 1986).

Lesthaeghe’s use of data from surveys, vital registration, and other sources to trace the rise and regional patterns of postmaterialist values in Europe and North America does not undermine the institutional model itself: values, norms, skills and repertoires, and roles continue to provide the constitutive elements that shape institutions. However, it elevates values such as self-fulfillment and tolerance and gives them the power to affect behaviors directly, independent of any effects through institutional frames. Nevertheless, many elements of the institutional model persist in this body of work. Values, norms, and roles remain prominent as elements of culture; family behaviors are viewed as part of the “institutionally regulated . . . spheres” (Lesthaeghe and Meekers 1986:225), and culture, while seen as partially autonomous from economic and social structures, is also seen as shaped by them (Lesthaeghe and Surkyn 1988).

Most current work that examines cultural influence on demographic outcomes continues to bear some imprint of the institutional model, albeit much transformed from its early conceptualization. The concept of a norm continues to play a major role



in the literature,<sup>7</sup> albeit often in ambiguous ways (Mason 1983)<sup>8</sup> or with an uncertain empirical basis (Liefbroer and Billari 2010).<sup>9</sup> Values are also given a central role but one that tends to be disconnected from institutional frameworks. Today's discourse about cultural influence has been shaped by the expansion of demographic research that investigates cultural effects through survey measures of attitudes and values. Survey methods, by their very nature, tend to focus attention away from norms and toward individual-level preferences and identifications; they are predicated on the idea that people's identification with norms and roles vary across individuals and population groups. The influence of the institutional model is still revealed by the questions we ask, which focus on roles and normative behaviors, but the concept of a widely shared and sanctioned norm is lost. However, as Liefbroer and Billari (2010) argued, it may be premature to abandon the concept of norms. Where norms exist, as in the timing of certain life events, their effects on behavior remain powerful.

Unlike the holistic and tool kit models of culture, the institutional model provides a valuable model of how culture can be organized. However, it fails my adequacy test because its scope is too limited. The model works well for those parts of culture that are clearly structured by societal institutions (e.g., schooling) but gives us little to work with when institutional structures don't exist (e.g., for stepparenting; Cherlin 1978). The model works well when cultural norms and roles are widely shared but not when norms and roles are challenged and lose their social support. It doesn't work so well when institutions become "de-institutionalized," as Cherlin (2004) has characterized marriage. The model also can't account for a direct impact of values on behaviors; it allows only for influence that operates through norms and roles.

## A Network Model of Culture

The three models thus far reviewed all provide distinct insights about the nature of culture and have proven useful in decades of research. I do not propose that we discard any of them. I argue, however, that conceptualizing the elements and organization of culture at a more basic level can provide tools—a basic set of mechanisms and a common vocabulary—in terms of which all three models can be understood and integrated. It can provide the basis for a unified model of culture that can capture its holistic and organized characteristics as well as its variability and less-than-perfect coherence. Because meaning is so central to culture, and meaning is fundamentally cognitive, I draw on concepts and mechanisms in cognitive science for this more basic model.

The model I propose takes the form of a network. Culture is a network of meanings (rather than people, as in social networks). Demographers have sometimes used

<sup>7</sup> This claim is based on a scan of a 1-in-8 sample of the 229 articles with abstracts that referenced "culture" or "cultural" in JSTOR's population domain with publication dates since 2002.

<sup>8</sup> Norms need not be linked to institutions (Mason 1983) but may arise out of group processes; much current research invokes norms without explicit attention to their possible relation to institutions.

<sup>9</sup> Most studies measure individual attitudes rather than shared norms. Some studies have attempted to use attitude data from surveys to measure norms at the neighborhood or group level (e.g., Musick et al. 2008; Warner et al. 2011); earlier work relied on neighborhood structural characteristics as proxies for normative climates (e.g., Brewster 1994; Browning et al. 2008).

network imagery in talking about culture—for example, in saying that the meaning of marriage has changed because being married is no longer *tied* closely to sex and reproduction (e.g., Carlson et al. 2004). Networks are holistic but also permit the analysis of components and structure. They are familiar terrain for social scientists, and they lend themselves to quantification.

## A Cognitive Basis

There is a deeper rationale for thinking of culture as a network: networks represent meanings in the brains of individuals (Strauss and Quinn 1997). The basic element of a network model of culture is a schema, a concept from cognitive science. A schema is a relatively stable and abstract representation of the meaning of an object or event (Mandler 1984; Strauss and Quinn 1997). Individuals store information about their cultural environments, and all aspects of their experience, as schemas represented in the brain's neural networks.<sup>10</sup> A network model conceptualizes an individual's cognitive model of the world as a set of schemas, structured through the presence or absence—and nature—of ties among them.

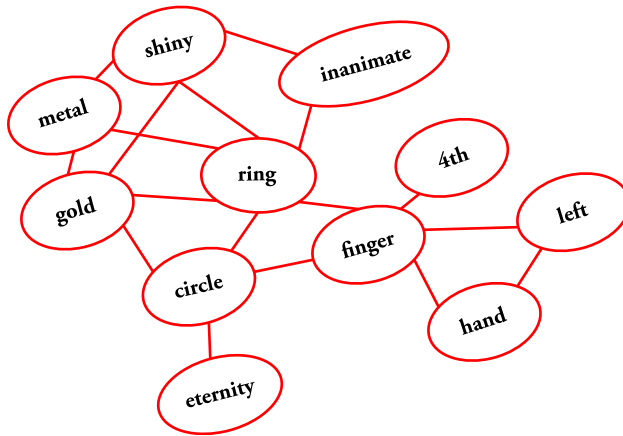
Schemas themselves can be conceptualized as networks. Even the very simplest of schemas is a network connecting microbits of meaning. Figure 3 illustrates a schema of a wedding ring by using words to convey the bits of information (the network nodes) that are linked (depicted by network edges or connecting lines) to form the schema. Those nodes that are more strongly linked are placed closer together. I use this highly stylized heuristic device for representing schemas throughout this discussion. I do not mean to suggest that schemas are fully linguistic or that an actual network representation of a wedding ring would be structured in exactly this way.

Schemas can be simple, representing a single type of object like a ring, or they can be networked to other schemas to produce schemas for action, such as sliding a ring onto a finger. They can be combined with many other schemas to produce complex structures that still function as schemas, but these structures are often referred to as *models* because of their size and complexity.<sup>11</sup> A model of marriage might tie together schemas relating to love, mutual fulfillment, sex, weddings, rings, commitment, and much more (Fig. 4). These webs of connectivity are real—real enough that the sight of a woman standing outside a church in a long white gown can bring to mind not only what this woman is doing but also a great many intuitions about what her future life will be like.

Schemas do not simply represent cold facts or definitions (Damasio 2010; Ignatow 2007). They incorporate evaluative meanings as well, rooted in the visceral and

<sup>10</sup> We are wired to do this. Neurons have evolved to connect in durable patterns that represent the patterns of features and associations that we repeatedly encounter as we experience objects and events in the world (Damasio 2010).

<sup>11</sup> Using the concept of schema to encompass such a broad range of phenomena raises the question of whether different terms are needed to differentiate schemas of different kinds. In fact, we do have such terms: we have concepts, scripts, models, values, prototypes, worldviews, beliefs, and many other terms useful to cultural analysis. Schema is not a substitute for these terms but a basic element underpinning all of these. A second answer is that simple and complex schemas share a common name because they arise and become organized through a common set of mechanisms and serve a common function of representing meaning. There is no clear boundary between a simple schema and a complex one, and thus there is no logic to guide a distinction on the basis of size or complexity.



**Fig. 3** A heuristic network diagram of a wedding ring schema

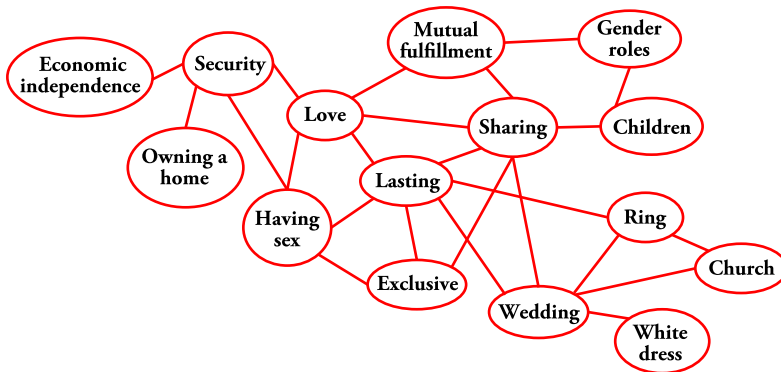
emotional feelings that we experience when we think about a concept, object, or event.<sup>12</sup> When social scientists speak of values, they are referring to schemas that evoke strong positive or negative feelings in us. For example, we may express as a “general moral principle” that all individuals deserve respect. However, the motivating force of the schema that links “individuals,” “deserve,” and “respect” comes from the emotions that we feel when it is activated in the brain (LeDoux 2002; Vaisey 2009).

### Using Schemas to Represent Culture

The idea that schemas can be viewed as basic elements of *cultural* meaning is not new. It was suggested in the late 1990s by two cognitive anthropologists, Strauss and Quinn (1997) and by sociologist Paul DiMaggio (1997). Several demographers have suggested its potential for demographic research (Bernardi and Hutter 2007; Bledsoe 2001; Kennedy 2004). If a schema represents an object’s typical features and associations for an individual, then a cultural schema represents the meaning that is shared across members of the group.

Culture as a whole can be viewed as a massive and multiply nested network of schemas. At the highest level, we can think of culture as a network linking different cultural *models* more or less closely together. For example, in Fig. 5, the model for marriage is more closely tied to the model for homeownership than it is to the model for citizenship. Each cultural model is a network of schemas representing action, objects, and simple concepts relating to a particular domain. The individual schemas within the model are themselves networks of microbits of meanings expressed in language as basic features, such as “shiny” or “round.” The schemas in a network model of culture need not be mutually compatible. Just as members of a social network can have positive or negative relations with each other, the meanings in a network model of culture can be consistent or inconsistent and compatible or opposed. However, just as in

<sup>12</sup> As Basu (2006) argued, emotions play a basic role in demographic behaviors, such as condom use in sexual relationships, marriage, and childbearing. They do so through embodied emotional responses linked to schemas in the brain.

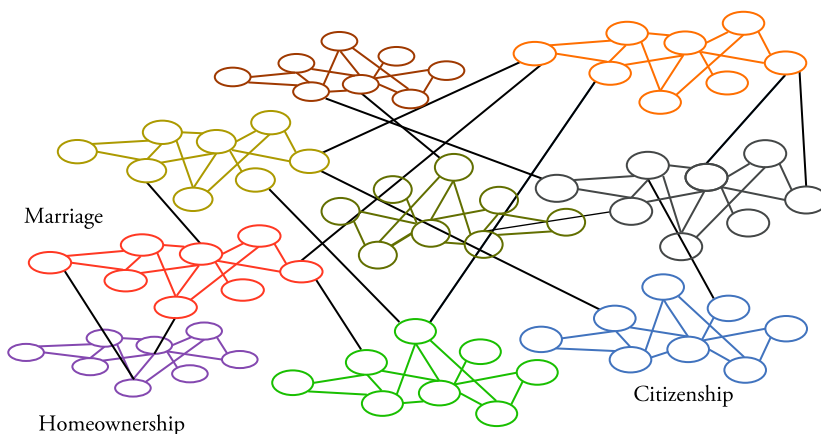


**Fig. 4** A heuristic network model of a complex schema (model) of marriage

social networks, network structures will tend toward patterns of organization that permit these discordant elements to coexist.

Two primary mechanisms organize the structure of the network. First, just as an individual's own experience organizes knowledge structures in the brain, a group's shared experience structures shared schemas and models. Shared meanings arise because members of a group tend to inhabit similar worlds and have similar experiences (Strauss and Quinn 1997). They learn similar schemas through the observable things in their shared world: physical objects such as wedding rings, real estate brochures, and Supreme Court decisions; people's actions and speech; and even subtle forms of body language that signal approval or disapproval. Second, a group's shared culture is organized by its members. This is happening when group members reproduce or reframe conventional meaning structures in their thoughts and behaviors; it is also happening when divergent meanings become aligned through social interaction (Ridgeway and Smith-Lovin 1994) or when group processes influence whether innovative interpretations and actions become shared (and integrated into material experience) or discarded.

If culture were perfectly shared, a network model of culture would look exactly like the cognitive model of the world held by any one individual in a population. But culture



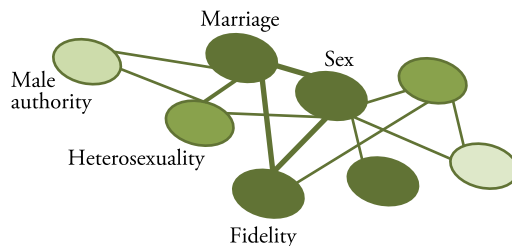
**Fig. 5** Envisioning culture as a network of complex cultural models

is *not* perfectly shared. People have different experiences, and they think about their experiences in different ways, so the ways in which individuals organize their knowledge of the world differ (Lockwood 1995; Strauss and Quinn 1997). For example, as Harding (2010) documented, people in disadvantaged neighborhoods vary in their attachment to alternative models of parenthood grounded in mainstream and “sub-cultural” values. Within large populations, many such alternative cultural models can exist. At the same time, without a significant amount of overlap among the cognitive models of interacting individuals, social life would be impossible. Even in Harding’s disadvantaged neighborhoods, residents do share massive amounts of knowledge and meaning. A model of culture needs to capture both cultural sharing and diversity within a population.

Modeling this semi-shared nature of culture is messy but doable. Picture culture as the aggregated sum of the cognitive models of individual members of a population. Those parts of the network that are fully shared can be weighted more heavily, and those parts that are contested or unshared, less heavily. Figure 6 illustrates this with darker shaded nodes for elements that are more widely shared than others and thicker edges for associations between elements that are more commonly shared. In this example, most group members agree that marriage is linked to sex and fidelity, but some differ on its linkages with heterosexuality and male authority.

For population scientists with interests in behavior, this representation works well. It aggregates cultural knowledge as it exists in the minds of individuals belonging to a population, where it sets the stage for behaviors in response to situational cues (Johnson-Hanks et al. 2011). But individual cognitive models change gradually (Gazzaniga 2011), and so this representation may lag behind the cutting edges of cultural change. One can also examine the networks of meaning implicit in key material drivers of cultural change, such as media content (Wilmoth and Ball 1992). A network model of culture accommodates both culture “in the mind” and culture “in the world,” both of which are essential elements of a multilevel model of culture (Fig. 1).

The conceptualization of culture as a network provides a common set of concepts and mechanisms that bridge the three models of culture discussed in the previous section. The concept of schema provides a simple vocabulary for conceptualizing virtually all the terms we now use to refer to culture. For example, a role can be conceptualized as a set of schemas—for behaviors, relations to others, and motivations—associated with a particular position. A norm is a schema for action that



**Fig. 6** Network representation of a cultural model that is partially shared within a population. Schemas that are more widely shared as elements of the model are represented by darker nodes; those less widely shared are indicated by lighter nodes. Similarly, associations between elements that are more commonly shared are represented by heavier edges, and those less commonly shared are indicated by lighter edges

is shared and valued highly and widely enough to motivate sanctions for its violation. A value is a schema that carries a shared consistent positive or negative association. An institution is a cultural model composed of relations among schemas, as in the model of marriage in Fig. 4. The concept of schema can also capture the meaning of worldview, script, code, belief, attitude, and many other terms that populate current discussions of culture. This term also allows us to talk about ideas or values that transcend specific institutions—for example, individualism—and about behavioral scripts that no longer have normative force but remain active elements in a cultural field, such as female domesticity.

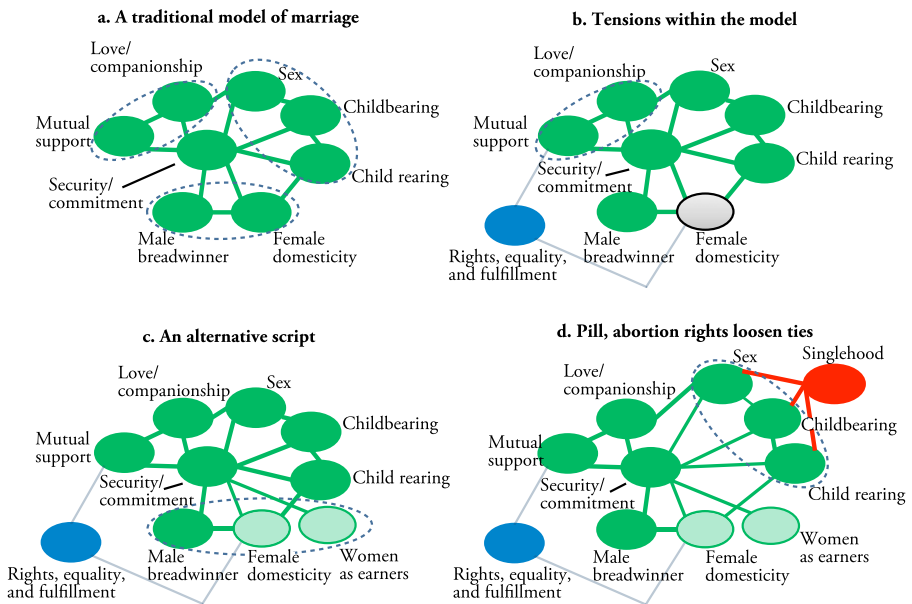
A model of culture that links schemas to form a network permits the representation of culture in a holistic fashion but with explicit attention to how elements are organized in relation to one another. It incorporates the relations among schemas basic to the institutional model but allows for a much broader and more flexible set of structural arrangements. It is similar to the tool kit model in conceptualizing culture as a diverse set of ideas and scripts, but its focus on how these are organized in relation to one another recognizes the reality that individuals' cultural choices tend to be structured by experience.

## An Illustration

To summarize my argument so far, conceptualizing culture as a network of schemas achieves some of the criteria I have proposed for an adequate model. It builds on existing scientific knowledge, offers a simple vocabulary that addresses the full range of relevant cultural elements, describes how culture is organized, and is useful at both micro and macro levels. In this section, I illustrate how a network model can aid in visualizing and reasoning about culture by making explicit the relations among schemas. My example translates into network form the narrative explanations that demographers and social historians (Cherlin 2009; Coontz 2005; Thornton et al. 2007) have offered to explain the cultural underpinnings of changes in marriage in the United States over the last half-century. It illustrates how we can model changes in cultural landscapes as changing relations among schemas caused by external events and social action and how the initial structure of the model influences the evolution of those changes.

I start with a stylized network representation of the dominant model of marriage during the first half of the twentieth century, up through the 1950s (Fig. 7, panel a). This model centered on three interrelated sets of schemas. One set linked love and companionship to the idea of mutual support between partners. A second focused on the economic foundation of marriage: the idea of separate spheres in which women depended on husbands for financial support and men depended on wives for domestic labor. A third set of schemas, partially linked to both love and separate spheres, focused on sex, childbearing, and child rearing. Security and commitment played a unifying role in linking all three sets of schemas.

A “perfect storm” of events provoked changes to this model in the second half of the twentieth century. The civil rights movement brought schemas of individual rights and equality forcefully into the public sphere. Increasing material affluence propelled schemas of self-fulfillment to the forefront and fed increasing standards of



**Fig. 7** A stylized network model of change in the cultural model of marriage in the United States. Based on Cherlin (2009), Coontz (2005), Thornton et al. (2007), and others

consumption, while subsequent economic change challenged the ability of couples to satisfy these on a single income. The arrival of the Pill and abortion rights delinked sex from the risk of pregnancy and parenthood in the popular imagination.

How did the model of marriage evolve in response to these changes, and why did it take the course it did? I argue that the structure of the cultural model as it existed in the 1950s was consequential for whether and how these external events changed marriage. For example, when the women's movement appropriated schemas of equality and rights to frame discussion of women's roles, they did so in the context of a model of marriage that valorized mutual support and companionship between partners. Parallels between female domestic servitude and the denial of rights and self-determination to black men created tension within the marriage model: how could the same model endorse love and mutual support in marriage and a female role that deprived wives of their rights (Fig. 7, panel b)? Affect control theory, a theory in social psychology (Ridgeway and Smith-Lovin 1994), suggests that when ideas with discordant affective values are brought together, something has to happen to restore equilibrium. In this case, some women began to devalue marriage altogether (Thornton and Freedman 1982), while others moved to change gender roles within marriage.

The challenge to separate spheres was also supported by the existence of other schemas within the culture. Experience during World War II powerfully demonstrated women's capabilities to contribute outside the home, while scripts legitimizing women's work as "helping to make ends meet" had evolved in working-class culture (Fig. 7, panel c). These schemas were largely avoided in popular culture valorizing the



ideal of separate spheres during the 1950s (Coontz 2011) but were available to women reframing the discussion of women's roles and increasingly important as rising consumption standards and declining real wages for less-educated men drove women into the workforce.

The arrival of the Pill and abortion rights both changed the model of marriage and made it less necessary. These developments made possible a new model of singlehood that incorporated elements initially tied only to marriage: first sex, and then reproduction and child rearing as well (Fig. 7, panel d). Although sex, reproduction, and child-rearing activities remained elements of the cultural model of marriage, their associations with marriage were weakened by the competing model. With society tolerating alternative approaches to family formation, women no longer needed to marry.

With two of the three sets of schemas that were initially central to marriage seriously challenged, why didn't the model simply disintegrate or fade away? And how did its initial structure allow it to survive, albeit in an altered form? Cherlin (2009) made a convincing argument that marriage has remained strong because it has become a means to self-fulfillment. This was possible because by the time that the perfect storm of events undercut the dominant model of marriage, marriage was already linked to self-fulfillment, experienced as love, companionship, mutual support, and sexual satisfaction. If this core had not been central to marriage (e.g., if marriage had been seen as primarily an economic arrangement), the changes of the 1960s and 1970s might well have made marriage obsolete. Instead, a new model of marriage has evolved, one focused around these high-value schemas (Fig. 8) and the schema of commitment and security central to the initial model. A new economic foundation that retains the male breadwinner script but makes women's economic contributions increasingly central draws in schemas of equality and fulfillment, expands the meaning of mutual support, and integrates more comfortably with schemas related to love and companionship. Links to sex, childbearing, child rearing, and female domesticity are still active in the model, but their links to marriage are attenuated.<sup>13</sup>

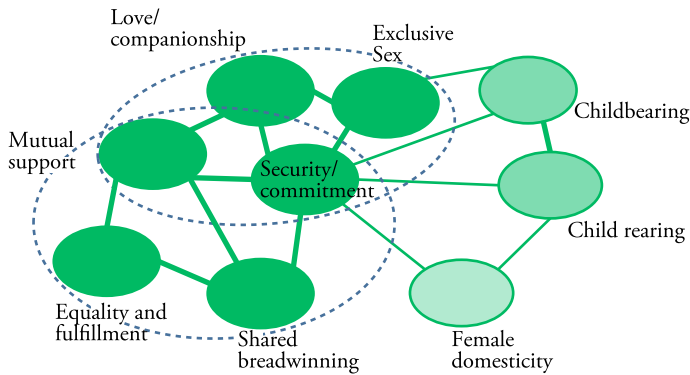
The illustration presented here is limited to showing, in principle, how one could translate existing accounts of cultural change into network form and relate network structure to evolution in the cultural underpinnings of demographic change. Going further depends on my final criterion for an adequate model of culture: namely, that it permit quantification.

## Quantification, Measurement, and Integration

Demographers have long been quantifying elements of culture through the use of surveys to measure and analyze attitudes, values, beliefs, subjective norms, and behaviors (e.g., Martinez et al. 2006; Thornton et al. 2007). This approach has served us well, providing not only important descriptive information about cultural trends but

<sup>13</sup> This new model is now being transformed in new ways. With the framing of gay marriage as an issue of rights and equality, the solid association of heterosexuality with marriage in traditional marriage models was challenged and is being progressively undermined (Baunach 2011). At the same time, many aspects of traditional marriage models—for example, mutual support, love, exclusivity, child rearing, and commitment—are adopted in same-sex relationships.





**Fig. 8** Network representation of an emerging model of marriage. Based on Cherlin (2009), Coontz (2005), Thornton et al. (2007), and others

also evidence for the influence of cultural factors in demographic behaviors. For many of our purposes, these existing methods may provide an optimal approach.

However, by making the elements of culture explicit and opening the door to analyzing their ties and structures, a network model may take us further in three ways. First, it makes the assumptions implicit in our current approach both explicit and open to investigation. We assume that our measures are capturing the key schemas that drive our demographic outcomes, that they have equivalent meaning across groups, and that they can be understood apart from the structure of the cognitive or cultural models from which they are drawn. Second, the network model also focuses attention on measuring meanings as well as attitudes so that we can tell not only that two groups value marriage equally but also that they hold similar cultural models of what it entails.

Third, a network model offers new quantitative measures of the structure of cultural models that could be used as independent or dependent variables. For example, if we are interested in understanding cross-national variation in the linkage between female labor force participation and low fertility, we might develop network *distance* measures for the relation between work and motherhood schemas in cultural models of female adulthood. We could measure the levels of *centrality*<sup>14</sup> of filial and conjugal bonds in cultural models of the family, as a step toward testing Livi-Bacci's (2001) hypothesis that it is the filial dimension of familism that has led to low fertility in Italy and Spain.

Deriving valid empirical measures of schemas and their network structure is a challenge. The best way to measure the schemas that people carry in their heads is to make them use those schemas. This is what attitude and belief items familiar in demographic surveys do; it can also be accomplished through card sorts (Brown et al. 2006; Shweder 2003), vignettes (Nock et al. 2006), open-ended nondirective probing (D'Andrade 1995), and a host of well-developed ethnographic methods. Laboratory methods that assess emotional reactions to stimuli, attentional focus, and reaction times may provide new windows into the structure and affective

<sup>14</sup> Distance is defined as the minimum number of ties required to connect two particular nodes in a network; centrality is a measure of the importance or influence of a particular node within a network. A simple measure of centrality is the number of ties a node has.

content of schemas. These are beginning to move out of the lab into web-based research and even personal interviews. For example, the Implicit Association Test, which is now implemented on the Internet, has provided evidence that racial stereotypes shape Americans' cognitive responses even when those stereotypes lie below the level of consciousness (Greenwald et al. 1998).

Other new methods provide powerful ways of measuring how schemas are organized in relation to one another. Data mining techniques for textual data—in various media, and in people's stories and conversations—draw out the relationships among ideas, the distribution of ideas across social space, and the affective meanings associated with people and events (e.g., Carley 1994; Hopkins and King 2010). For example, Rackin (2013), analyzing qualitative interview data, showed that meanings of marriage and childbearing are deeply intertwined among young African American men and women who are not yet parents. Her conclusion is based on a computational analysis of how relevant terms are used in relation to one another in the interviews.<sup>15</sup>

Tools like this may enrich our ability to describe cultural variation within and across populations. With the massive expansion of “big data”—which I define as the electronic capture of the trillions of transactions, posts, calls, and movements that populations generate each day—material for mapping cultural sharing and variation is more accessible than ever.<sup>16</sup> New tools and data could also allow us to study how these patterns emerge by relating measures of cultural network sharing and variation to group members' social network patterns, status hierarchies, and institutional ties. Some anthropologists have done similar analyses in semantic domains, such as kinship and emotion, and in behavioral domains, such as game playing. They are able to show empirically that meanings are shared and that the degree of sharing is structured by shared language and nationality (Romney and Moore 2001).

How could we integrate a network model of culture into demographic research? For conventional comparative or trend analyses, quantitative measures of cultural models could serve as variables in regression equations. However, a network model of culture also invites new kinds of modeling. Regression models provide an awkward fit to modeling culture because culture so rarely acts as an exogenous independent variable.<sup>17</sup> However, dynamic systems (Stermann 2001) and agent-based modeling (Epstein 2006) represent endogenous processes well; they can be used to examine hypotheses about processes of cultural change and their relationship to demographic outcomes. For example, such models might be used to explore whether and how Internet dating has affected marriage (Slater 2013). By embedding network models of marriage in a multilevel dynamic model, we might trace the impact of this newer technology shock on marriage behavior by analyzing how cultural meanings have evolved around it.

<sup>15</sup> Moody (2013) conducted a similar analysis using essays on personal beliefs posted to the This I Believe website (<http://thisibelieve.org/>).

<sup>16</sup> The validity of these measures has yet to be carefully established, and many lessons remain to be learned about their use in context of theoretically informed demographic studies. Bringing demographic perspectives to bear on these issues is vitally important.

<sup>17</sup> Cultural variables are not uniquely subject to the problem of endogeneity, but because cultural schemas and their material expressions are interdependent, the threat of endogeneity is more commonly perceived in this domain. That is not to say that cultural variables cannot act in exogenous ways, as in the exportation of new ideas from one culture to another.

A network model also invites new kinds of questions. Too often, demographers limit themselves to asking questions that our existing tools and data can answer. Investing in new tools and data may enable us to ask, and answer, more of the “how and why” questions that are critical to understanding population change:

- Do models of gender vary across sub-Saharan Africa, and do these variations affect variation in the slowing pace of fertility declines?
- How does the fit between new immigrants’ cultural models and those in their destination communities affect their adaptation? What kinds of misfit are most damaging to immigrants’ well-being?
- How do dominant American schemas of individualism and freedom affect health behaviors, the health care system, and, perhaps ultimately, the U.S. disadvantage in health and mortality relative to other advanced economies?

## Conclusion

I have argued that culture should stop being demography’s reluctant bedfellow and develop a committed partnership. Culture has always been a necessary element in thinking about population change and variation, even if we have not always recognized its implications for the subjects we address and the tools we use. Many demographers have contributed to our understanding of culture and its relationship to population phenomena: anthropological demographers and qualitative sociologists who have conducted ethnographic studies of family, fertility, migration, and mortality as well as quantitative analysts who have exploited survey measures to understand variation and change in attitudes and beliefs across populations and their impact on demographic behavior.

My goal in this essay has been to underscore the potential for improving the conceptualization, measurement, and integration of culture in demographic research. I suggest that a network model of culture, grounded in cognitive science, may provide a useful tool. I focus on the cognitive dimension of culture, not because material culture is unimportant, but because meaning is central to both material and nonmaterial culture. My model develops a conceptualization of what culture consists of (schemas) and how it is organized (a network structure) at a more basic level than other models that have been used in research on culture. In doing so, it provides a means to bridge existing models. It captures the holistic nature of culture. It embraces the institutional model of culture but allows us to address aspects of culture that are not easily captured within an institutional framework. It recognizes the tool kit model’s insight that cultures often provide a multiplicity of beliefs, worldviews, and scripts that may not be coherent or consistent, but insists that these are nevertheless organized in relation to each other and that this organization is consequential for people’s use of culture.

For demographers, the model may provide a way to explicitly model the organization of cultural schemas and to develop quantitative measures that capture features of that organization. These, in turn, could be used to enrich our understanding of how cultural attributes are distributed within and across populations and the ways in which these distributions, in combination with material opportunities and constraints, contribute to demographic outcomes.

The next step in pursuing a network model is to use existing data and methods to develop an empirically based example, a task that I did not attempt in this essay. Depending on the precise question to be explored, existing survey measures of attitudes, beliefs, and values could be used for this, as could the many burgeoning forms of “big data.” The development of empirical examples will be facilitated by continuing innovation in methods for measurement and modeling.

Demographic data on marriage and divorce testify plainly to the challenges involved in building and maintaining committed partnerships. This essay undoubtedly leaves many unanswered questions and doubts about the value and feasibility of the network model I have proposed. My intention has been to offer one possible pathway toward improving the integration of culture in demographic research as a way of inspiring others to take on the challenge.

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