

Reflections in honor Ron Lee
“Time and Fertility”
by
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Thank you, David, for including me in this wonderful event. It is a real pleasure to get to celebrate Ron and his work. Both are defined by energy, rigor and creativity, and also by a certain element of contradiction. For example, many of you will know how startling is the contrast of finding such a sharp intellect packaged in such a gentle smile—a gentle smile to which I will return at the end. Another contradiction that you are likely to know concerns empirical topics and conceptual questions. Ron has contributed to nearly every field of contemporary population sciences, from economic demography to formal demography to historical demography to biodemography. And yet, his work is animated by a small number of fundamental theoretical issues that are fundamentally about population and time. These issues concern population systems, homeostasis and change, uncertainty, and the lifecycle. Many scholars have empirical scope, and others have conceptual depth. Ron Lee is remarkable for having both.

At least since Saussure, the human sciences have struggled to integrate two distinct views of human facts. One perspective focuses on synchronic systems, like a freeze-frame photograph that allows analysis of relationships outside the flow of time, as Saussure himself does with grammar. Bourdieu described the Kabilye calendar as a “synoptic illusion,” and much of social science has likewise created synoptic illusions in order to see systems more clearly. The other perspective is diachronic, focused on historical process, and the development of one thing out of another, eliding structural regularities in order to see change more clearly. Our

discipline contains both tendencies—the synchrony of stable population theory alongside the diachrony of demographic transition theory.

But one of the most important intellectual moves of demography is to try and hold both views of population simultaneously, to see the relationship between structure and change—to study systemic processes and processual systems. Who but a demographer would develop a formalism that allows you to visually perceive the relationship between two kinds of time? Or offer a model of population and economy in which the normal state of affairs is to be in each moment a moment away from systemic disaster that nevertheless never comes?

And it is this context—the complicated tradition not only of Lexis and Malthus, but also of Sauvy and Ryder—that we need to see Ron’s remarkable and sustained contributions to the study of demographic dynamics.

For the next ten minutes or so, I want to argue that the problem of integrating synchronic and diachronic perspectives on population animates many of Ron’s empirical projects, from the worktime of Mayan children, to the moving fertility targets of post-baby-boom America, to the modeling of historical change in vital rates in Europe, to population forecasting. Ron has worked on the problem of integrating synchronic and diachronic perspectives at multiple scales, from hundreds of thousands of years in his work on the evolution of life history strategies, down to year-to-year fluctuations in birth rates. And Ron has sought to integrate synchronic and diachronic perspectives both within population systems and in the relationship between population and economy. Because all of these projects address the same underlying conceptual issue, the whole that they compose is more than the sum of their already impressive parts. So I want to try to persuade you that in addition to his many other accomplishments, Ron Lee is one of our finest theorists of time in the human sciences.

The problem of structure and time appears already in Ron's 1971 dissertation, which takes up the question of how population change in the past related to economic change. His commitment to historical demography runs through a long series of papers, as David has so eloquently discussed, and I won't rehearse that line now, except to say that the centrality of time to these papers is obvious. And obvious, too, is the centrality of structure. Since Malthus, we have reason to believe that population size, density, and age structure should matter for subsequent vital rates, setting up feedbacks in population dynamics, especially through economic processes. But explaining historical change this way has proven challenging, because—as Ron has argued in a couple of different ways—the contexts in which age structure dominates are rare. If age structure matters to population outcomes, it is because age-specific rates in the recent past have been changing; and if rates in the recent past have been changing, they are likely to keep changing; and if they keep changing, then the changes in rates will usually drive more of the variation in subsequent population outcomes than will age structure itself. This insight has enormous consequences for cultural demography, but also for forecasting.

Starting with a couple of papers in 1974, Ron began to consider how we can think about fertility after the fertility decline, that is, fertility in a period where year-to-year fluctuations are large relative to any underlying trend. Time is here closely related to uncertainty, in the sense that the central uncertainties come from the fact that time periods differ in often unknown ways. In these contexts, Ron explored ways of modeling future fertility as a stochastic process with different kinds of autocorrelation. The aim here was to connect demographic intuition that recent fertility is the best predictor of future fertility, with the-then contemporary computational armature for modeling stochastic processes, and something like

Easterlin cycles, in which population dynamics produce their own echos. In a 2004 review piece, Ron claimed that “the future did not oblige by conforming to the predictions of [his] model,” but he is perhaps too harsh a critic of himself. I imagine that we can all think of reasons that the 1980s were unsuitable for a renewed baby boom, and given what has happened to US fertility since the great recession, some mix of empiricism and humility seems suitable for us all.

In 1977 and 1980, Ron took on the problem of fertility intentions and outcomes, in the widely cited papers “Target Fertility, Contraception, and Aggregate Rates,” and “Aiming at a Moving Target.” These were the first of Ron’s papers that I read as a graduate student, and they have marked my thinking in a profound way. These papers are remarkable for the way they turn time on its head, showing that simple causal relationships can produce complex and seemingly contradictory patterns when they are set into temporal motion. The papers argue that desired family size may drive fertility outcomes at the same time that it is a lagging indicator of them. Or, to quote the 1980 paper, “when desired family size fluctuates, turning points in period fertility may precede those in desired family size by as much as five years.” The apparent paradox arises because fertility outcomes do not respond directly to desired family size, but rather to the difference between desired family size and the number of children that women have already borne. If both desired family size and therefore fertility are rising, more and more couples will reach their desired family size, and therefore stop childbearing, leading to a fertility reversal *before* desired fertility starts to fall. And in fact, Ron shows clearly that coming out of the baby boom desired family size started to fall well *after* period fertility.

Here we see one of the most striking elements of Ron’s approach to synchrony and diachrony. History for Ron is neither derivative of structure nor

haphazard, but is rather the process through which population systems emerge. And population systems are neither fixed things, nor things that are the mere consequences of monumental history. As much as any other population theorist in America, Ron has focused on processual systems and systemic processes. He has found ways to write formal models that capture the complexity of population change, rather than ignoring it.

I want to turn now to two other bodies of work that might appear on the surface to be unrelated to fertility after the baby boom. One concerns wealth flows from parents to children and the family cycle in Yucatan. The other concerns wealth flows between parents, children, and grandparents, and the evolution of human life history. What these works share with each-other of course is attention to what anthropologists have called cyclical time—where one life stage or household form replaces another in a structured way. The relationship between cyclical and historical time is a complicated one, as is partially captured in Ryder's discussion of cohorts and social change, but only partially. In the Yucatan work, collaborative with the anthropologist Karen Kramer, Ron shows that even though wealth does not flow upward from children to parents, as Caldwell predicted it would in this kind of context, children are economically very valuable to parents, because through children, parents can transfer their labor from one time period to another—early born children make it possible for parents to rear later-born children, who are in turn important for maintaining parents' households. While children do not pay their way in a Yucatec Maya household, once you consider them as vehicles for parents' time travel, their importance becomes clear.

In the Maya case, time enters the analysis in another way as well. In order to assess whether wealth travels up or down, Ron and his co-author have to quantify both consumption and work, and both require precise measures of time. It is not

only that older children can provide for younger children, but rather that older children's time can substitute for the time of parents. So it is actually labor time that is moved across life cycle time, and only a theorist of time could have seen it.

Another set of contributes on life cycle focus on the evolution of human life span and the pattern of maturation and senescence that characterizes our species. In 2003, Ron published "Rethinking the Evolutionary Theory of Aging," his first in a series of papers on this topic. Biologists have sought to explain senescence by focusing on fertility. After the ages of childbearing, the argument goes, there is no evolutionary mechanism to select against harmful mutations, and any mutation that has benefits in childhood but does harm at older ages will be actively selected for. But Ron shows quite dramatically that the antagonistic pleiotropy argument fits the pattern of older age mortality in hunter-gatherers only poorly, and explains high rates of infant death not at all. By focusing on intergenerational transfers, rather than births, Ron provides a much better fit for the data, and a radically more interactive and social model for human evolution. Again, what makes the model interesting is that it trades on multiple scales of time, identifying population structures on one temporal scale as the product of interacting process on another temporal scale. In this sense, better explanations of the past generate clearer visions of the future.

And that brings us back to forecasting. Ron has described his work as stemming from the problem of forecasting under uncertainty; he has published dozens of papers on forecasting; and the Lee-Carter method of population forecasting is now a standard method. The conceptual issues of forecasting under a regime of changing rates that Ron identified over 40 years ago remains important, although we do have better statistical tools. Ron has argued that "most demographers view forecasting as a mechanical exercise having little intellectual

content” although it is important. But his work in forecasting has never been mechanical. The questions he asks about structure and feedback and endogeneity have always pushed us to think harder not only about forecasts, but about the temporal production of populations.

Now, I know that this is the scientific portion of the program, and we should be serious here, but I want to end with a brief anecdote. One of my friends is a faculty member in the Berkeley economics department. He is 32 years younger than Ron and a sporty fellow. I didn’t ask his permission to tell this story, so let’s just call him Bob to protect his identity. Bob and I arrived at Berkeley about the same, and a few years later—so, maybe 12 or 14 years ago now—Bob found out that Ron played tennis. He asked Ron for a game, and a few days before the game was set, Bob told me he was going to go easy on him, because he didn’t want to beat his senior colleague too badly. I didn’t say anything.

About a week later, I saw Bob again, and asked how the game had gone. Bob’s account was this: the first game, he went easy on Ron, and Ron trounced him. The second game, he played normally, and Ron trounced him again. The third game, he played absolutely as hard as he could, and Ron trounced him just the same. And the most amazing part, Bob said, was that all the way through, Ron looked calm and happy, he just had that same gentle smile.

Now, I don’t know how far this analogy works. Did the central theoretical questions of population science ever plan to go easy on Ron, just to be trounced by his sharp intellect? Hm, maybe not. But for over four decades, Ron has played a remarkable game, serving bold idea after idea with energy and style. His contributions have been both empirical and conceptual, rigorous and creative, and seem to always come packaged in that gentle smile. Thank you, Ron, you have been an inspiration to so many of us. And warmest congratulations.