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THE EVOLUTION OF DEMOGRAPHIC STUDIES. AN OVERVIEW FROM THE '80s: FROM A MACRO DESCRIPTIVE PERSPECTIVE TO DYNAMIC ANALYSIS OF BIOGRAPHIES

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1. INTRODUCTION[1]

"*Modern demography had to await the development of a scientific outlook and counts of population and vital events that where reasonably complete*" (Caldwell, 2000).

Demography has been considered, for a long time, a mainly descriptive science (an outdated assertion today), but rather than the science of man in his environment, a discipline strictly connected with the presence of population statistics, or more generally of adequate data. The link between demographic approach and data has always been very strong and ambivalent. This close relationship is very clear even in the period that this work has chosen to deal with, that goes through the 80s to the 90s. The reasons for this choice are related to the recognition that just starting from the last two decades of 1900, population studies have undergone a rapid evolution in the techniques of analysis, subjects and data collection.

Starting from the '60s demography has been constantly enriched both from the point of view of the methodology and for what concerns differentiation of population investigations. At the beginning of the '80s there were the right conditions for the spread of a new phase of investigations focusing in particular on micro approaches. It took two decades to complete the transition from a macro cross-sectional analysis to a longitudinal micro approach.

The subject is very extensive and complex to be treated in depth. The attempt of the paper is to provide a simple description and a first reading of this transition, referring when possible to personal experience in training and research activity.

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2. FROM MACRO TO MICRO LONGITUDINAL ANALYSIS

In order to simplify the discussion and to better understand the route in the development of paradigms and methods in demography, between the end of the seventies and thereafter, it seems very useful to recall a convincing scheme proposed by Santini (1999), that very effectively identifies "...the right coordinates to which it's possible to refer to in the research of general guidelines..." for the evolution of the discipline.

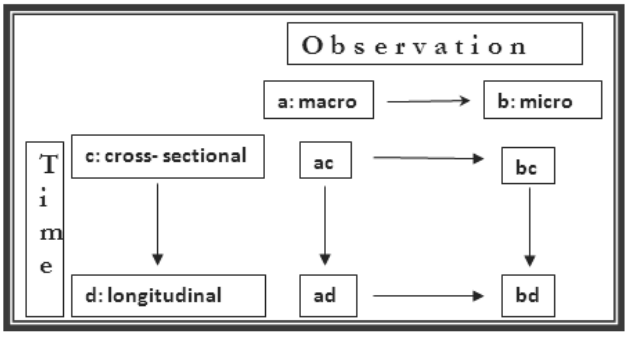

Figure 1 – Types of demographic approach. Source: Santini, 1999, p. 6.

The starting idea is "...that demographic events – births, deaths, marriages, migrations – observed and recorded when they occur (typically in cross-sectional form) are the 'result variables' of processes that place themselves sequentially over time and along the life cycle (in a longitudinal form) and pertaining micro- elementary units (individuals) or complex ones (families). In their turn, these micro- elementary units are part of macro-units (cohorts) whose aggregation constitutes the total population. This new theoretical framework is intended to give a simple and unifying reading to demographic processes. In the following paragraphs we only deal with the shift from macro to micro longitudinal analysis.

Researchers that were trained in the demographic discipline since the 80s, surely find their main references in the approaches to macro- cohort study of population phenomena (Whelpton, 1954; Hajnal, 1947, 1950; Henry, 1959, 1963, 1966 and Ryder, 1964, 1965), developed after World War II and dominating the demographic field until the mid-70s.

These approaches didn't move away from the close link between type and availability of official data and demographic measures. Moreover demographic studies were still essentially descriptive.

It was the greater availability of classifications according to the three dimensions of time (cohort, age and calendar year), made available by the official Statistics, that allowed the spread of a longitudinal and cohort approach.

The cohort analysis, although still within the macro framework, carries out the transition from descriptive and hypothetical- fictitious pictures to actual even de-

scriptive schemes (De Sandre, 1996). From now on cohort analysis will tend to consider the individual as part of a complex hierarchical system.

Most of the innovations are linked to the availability of data at the individual level, and at the same time the analysis reveals a systematic search of the factors that interact in the population processes, beyond the traditional demographic variables. Using Ryder's translation mechanisms, it is possible to read the classical synthetic measures distinguishing their *quantum* or intensity and calendar or tempo components (Ryder, 1980). We can define measures of the population dynamics at a "pure" state, excluding other disturbing factors, and then proceed to the identification of the weights of the competing phenomena influencing measures derived from observation.

The new paradigm makes it possible to identify selection effects linked to observations: the theory of reduced events traces demographic phenomena back to a single descriptive model whatever the events that characterize them and the sub-populations in which the events are produced.

Reasoning from this perspective we have become more and more used to consider populations as entities in constant evolution, subject to a process of continuous change in quantity and quality.

We mainly understood the role of time (both in a historical and biographical sense). The measure of the intensity or *quantum* (number of children per woman, the proportion of first married, etc.) of a demographic phenomenon in a cohort can be considered as a final measure of a process and it represents the actual situation, the *de facto* tendency.

Looking at the intensity measure of a demographic phenomenon one can see that this index is an average of a plurality of demographic behaviors linked to a continuous interaction of several and socially relevant factors related to the past choices of the cohort components, and situations of a specific historical period, for which, respectively, year of birth and year of observation are not-enough-informative proxies when the interest is focused on the determinants of behaviors.

In spite of this, the descriptive power of demographic analysis enables Santini to draw an exhaustive, overall picture of the actual trends in fertility and first-marriage behaviour for the Italian cohorts born from 1890 to 1966, bringing to light the basic parameters of the two processes: the strong stability of first marriage models in face of a much stronger and early fertility decline. Starting from the 1948 cohort to the most recent ones, the fertility index has declined by 70%. The presence in Italy, for a long time, of "two different Countries", the North-centre Area and the South Area, characterizes the process of family formation based on two distinct regimes of fertility (Santini, 2008). Anyway there aren't yet specific answers for a better understanding of the individual and family determinants of fertility change.

An example of the changing theoretical perspective can be found in the Word Fertility Survey that was carried out by 66 countries between 1973 and 1984, and was conducted in Italy in 1979 (the INF-1 survey). The core questionnaire for women included complete marriage and pregnancy histories, and sections on socioeconomic background, contraception, breastfeeding, and fertility preferences.

The WFS developed a formidable analytic capacity to complement its data collection expertise. The survey also represented an enrichment in terms of statistical methods applied to population data and made significant contributions to analytic methods such as the adaptation of linear models to individual-level measures of fertility and the application of hazard models to event histories.

In 1983 the Italian Institute of Statistics, Istat, carried on this new approach with the new survey "Strutture e comportamenti familiari", mainly based on an individual – level collection data.

This development has several underlying reasons. First of all a new phase of rapid social and demographic changes starts in Europe, that casts almost immediately into oblivion the previous period of slow processes and more or less stable dynamics the demography had become accustomed. The rapid increase of the change and the emergence of its social and geographical differences (formation and dissolution of marriages, fertility control and reproduction, survival, migration) in many industrialized countries alter more and more than in the past the life courses of individuals and affect the quality and quantity characteristics of the total populations. In this context the necessity to monitor and track innovations becomes more urgent and attention is specially focused on the intertwining of demographic behaviors and other social and economic dynamics. The goal is twofold: to explain the causes of the changes and analyze the impact that new demographic behaviors have on society: once more but in new terms, we deal with the distinction between period and cohort effects.

An important part of the transition seems to be linked to the spread of the individualization and differentiation processes of life courses associated with the demographic events. People face with more opportunities of choice, that must be carefully studied if the interest of the researcher is focused on fully understanding the new demographic dynamics.

The shift in emphasis is also on the collection of values and believes of individuals, their attitudes, expectations and future plans, giving that all these elements represent the outlines of the behaviors and choices. At a theoretical point of view it follows that each (demographic) event can be seen as a point in a biography, and it must be contextualized throughout the biographical history, so that it can be understood without losing the link with the context in which it occurs. As argued by De Sandre, so far we observed only the results of demographic processes and not the process itself (De Sandre *et al.*, 1998).

In fact, the classical structural variables of population (age, civil status and so on) give information on some factors that influenced the process mechanisms but they are not enough informative to distinguish causal relationships.

On the other hand it is more and more accepted the idea that if demography wants to consolidate its scientific autonomy, it must somehow step outside the descriptive phase and set its methodology up to context and causal processes (Santini and De Sandre, 1987).

A useful guideline to describe the level of complexity that links demographic events and their related processes, topics usually classified as behavioral demography, is proposed by De Sandre and pictured in fig. 2.

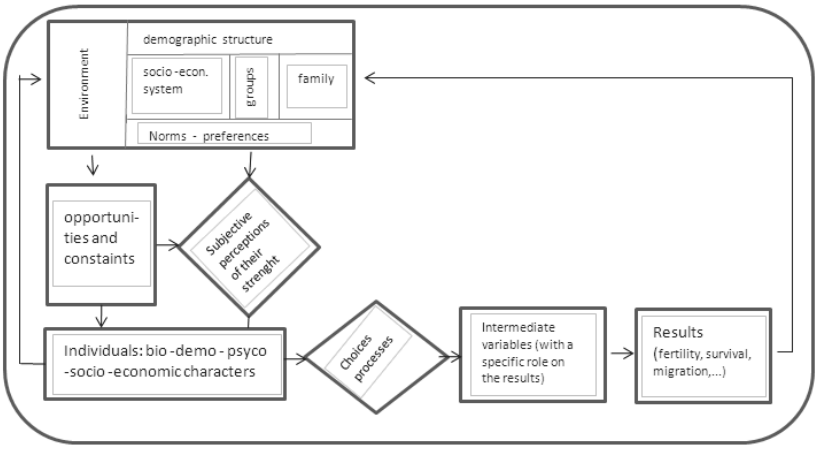

Figure 2 – A reference framework to study demographic processes (source: De Sandre, 1996).

The chart contains the main representative dimensions connecting together the macro context in which decisions are taken and the individual factors promoting and interfering those choices as personal characteristics, preference and value systems, kin relationships and so on. Indeed, as noted by Robinson and Harbison, economic, cultural, social and psychological forces all interact in determining the actual decisions of individuals that affect demographic behavior and structures of populations (Robinson, Harbison, 1980).

In the Italian experience as well, emphasis is more and more placed on life histories not only as simple sequences of demographic events. As expressed by Hobcraft "... understanding requires attention to pathways within the person, to processes whereby the person interplays with their context or environment, and to progressions through the life-course or over time, which involve the interplays of pathways and processes" (Hobcraft, 2005).

The transition from cohort analysis, where cohorts are considered as homogeneous units, to event history analysis can be explained following this type of perspective.

Each member of a cohort is simultaneously involved in various trajectories of life and in different systems (as couple or family member, worker, mother or father, student). Those different involvements interact with each other creating a space and time that is specific to each situation and influencing the final behavior. Our interest is on the analysis of interactions between demographic events or phenomena in order to evaluate how an event experienced by an individual will change the probability of other events happening to him over his life span (correlated biographies).

A biography can be thus considered as the realization of a complex stochastic process, which develops over time, is situated in a particular historical and geographical context, giving specific economic, social and normative conditions (Courgeau, Lelièvre, 1992).

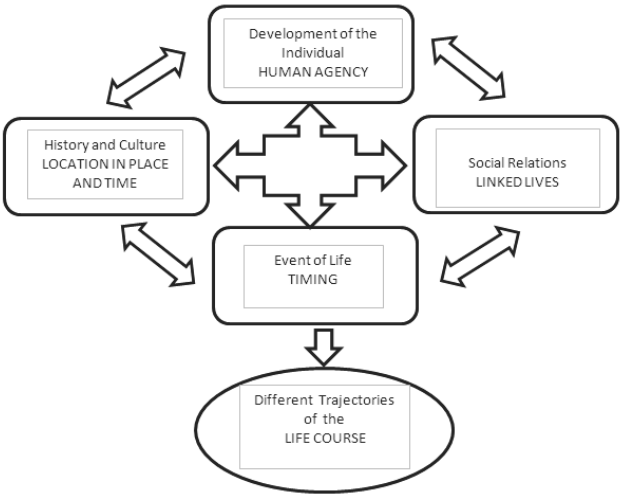

Figure 3 – Key elements of the Life Course Paradigm (Source: Giele and Elder, 1998, p. 11).

The frame in fig. 3 proposed by Giele and Elder is well known to social science researchers and appears to be very similar to that proposed by De Sandre. It recalls the main dimensions contributing to the complex interactions in biographies: the location in time and place, social relations (linked lives), human agency or individual goal orientation such as economic security, seeking satisfaction, timing of lives or the different pathways in the life course. Whatever a social location and relationships, personal goals and preferences, all come together and are experienced through the individual's adaptation to actual situations and events.

The causal analysis becomes one of the primary purposes of the demographic processes study with two main objectives: the analysis of interactions between demographic phenomena and the control of the heterogeneity of populations.

The statistical methodology mainly represented by hazard models is more and more used to estimate risks of experiencing an event, to estimate the basic parameters or functions of the chosen parametric or semi-parametric models, or baseline hazard rates, and the effect of covariates (fixed or time-dependent) on the baseline risk. The variables can be qualitative or quantitative, referring to the different observation units or groups to which they belong, prefiguring analysis even more complex as multi-level ones, with unobserved heterogeneity, with latent variables or variance components (Salvini, Santini, 1999).

3. THE FAMILY AND FERTILITY SURVEY

At the end of '80s a number of researchers promoted a new round of fertility and family surveys in the ECE region as a follow up to the World Fertility Surveys. The need for policy-oriented research in the fields of family and fertility recommended a deeper study of determinants of family formation, family plan-

ning and fertility. It endorsed a new round of comparative fertility surveys to address these issues in an innovative manner. The survey permitted international comparative analyses and included both men and women in autonomous samples.

As underlined by Cliquet (2002) the aims were very ambitious, such as the recording of life event histories of the relational, reproductive and educational-occupational careers, to study mainly their interrelations and feedback effects; the collecting of fertility attitudes, intentions and expectations with respect to future fertility timing as well as data on sexual intercourse, contraceptive behaviour, abortion and subfecundity. The intentions were to test new hypotheses, more particularly with respect to the individuation process, and to include, in this domain, questions on religiosity, materialism/postmaterialism and risk sensibility concerning partnership, parenthood and employment, in addition to the classical background variables on the geographical, demographic, occupational and ideological origin and status of the respondent and his/her partner.

The starting point in the development of the theoretical framework for the FFS was, obviously, the new wave of demographic changes – particularly in the field of relational and reproductive behavior – occurring in many European countries since the mid 1960s. They were resulting in a more or less pronounced trend towards below-replacement fertility, anticipating a future substantial ageing and the hypothetical possibility of a population decline.

In Italy the demographic and social framework of the '90s continued to change, even with a focus on marital behaviors (divorce, consensual and second unions) and reproductive careers (birth out of wedlock) that also involved strong control of conceptions and births and the emergence of new family structures. Demographers classified all these evolutions as "second demographic transition". The fertility rate remained extremely low, but the process of postponement of the transition to adulthood became stronger.

A lot of questions call for an answer: is it possible to speak about an Italian strategy of the long stay of the young in the parental home in the phases of life preceding the assumption of responsibility? How about the diffusion of consensual unions before marriage or after its eventual rupture? What are the different mechanisms for managing the reproductive process? What are the differences in behavior, opinions, expectations between generations? And what the regional disparities? What are the implications on reproductive choices of work careers, education levels, the relationships between generations and gender, economic conditions and cultural references?

The three main guidelines of the survey can be resumed as a) the specification of biographical times; b) the socio cultural dimensions; and c) the context in which individual life histories develop. The design survey takes into account the main features of the new paradigm, recognizing that the route towards better understanding of demographic behavior is based on the life course approach. Under this approach one looks at demographic behaviors as processes that evolve dynamically and interdependently with each other and with other processes in an individual's life course (De Sandre *et al.*, 1998).

I do not dwell upon the rich use of FFS and INF/2 databases. The numerous national and international papers and works have highlighted many of the characteristics typical of the social and reproductive behavior of generations born until the early '70s.

Nonetheless some considerations have to be made about the underlined limitations and the future intentions of research. In the keynote address to FFS Flagship Conference on Partnership and Fertility hold in Brussels in 2000, Cliquet focused on the fact that "it is not possible to study in a comprehensive way complex phenomena such as relational and reproductive behavior by means of large-scale sample surveys alone. The FFS, consequently, is limited in its research opportunities and should be complemented by other types of research" (Cliquet, 2002, p. 23).

As some researchers in population problems have rightly argued and when the contents of the new round of the survey has been concerned, a greater attention should have been devoted to data on newly emerging issues and problems, in particular regarding new social vulnerabilities and social cohesion.

Above all, in order to understand the ongoing trends in population dynamics, a general agreement has found to add further information on teenager and elderly biographies. Three main topics of research were suggested for the future: gender-relations, family-building and patterns of work; ageing, intergenerational solidarity and age-specific vulnerabilities; demographic and cultural specificity and integration of migrants.

After FFS, specific recommendations have been formulated with respect to the main dimensions of future research, the retrospective and prospective ones.

There is now wide agreement among population scientists that retrospective data only would thus be an insufficient empirical source for addressing theories that link change in people's demographic behaviors to changes in values and attitudes and then to demographic change in total population. Subjective factors (attitudes and values, social norms and their perceptions) but also economic elements that can vary from time to time depending on context cannot easily measured by means of a retrospective observation.

Indeed it is necessary to take into account that demographic behavior is not only determined by characteristics of the individuals directly involved in it, but also by the various contexts in which they act. All these dimensions interact dynamically in time. Adopting, for example, the prospective approach of a panel study, allows use of the rich information collected at the time of the survey to explain subsequent demographic events. As matter of the fact, with a panel design demographic events are not solely given the status of an outcome variable, but can also be considered as a cause of shifts in socio-economic positions and of values orientations (Lestaeghe, 2000). In this way the true dynamics of causation is better discovered.

Already in the 90s some studies based on the prospective approach show a high potential, to get stronger if also linked to the retrospective collection of events. A panel survey with a retrospective collection of events between two waves can respond to new information needs.

In Italy this turns out to be the design of the IDEA survey, a sample survey that took place as a part of a national research project titled "Life courses, family and reproduction between choices and constraints" aiming at reconstructing the demographic biographies of early adulthood by a collection of retrospective stories and explaining the determinants of the transition to adulthood, couple and family formation and fertility choices with a perspective approach.

A lot of research questions were present behind the paradox of the Italian lowest low fertility supported by strong family relationships and rising delays in transition to adulthood. The aims were to understand what got stuck in the process of formation of the individual choices that represented the entry into adult life, what was the importance of increased flexibility (work, emotional, contextual) in the design of the future, which role was played by changing of social expectations or the parental family, especially protective and accomplice in the presence of increasing uncertainty. Unfortunately the lack of financial supports didn't allow the implementation of the second wave of the survey.

Another interesting point is represented by the rising awareness that quantitative analysis may often be insufficient to unravel the complexities of social behavior in which the level of heterogeneity is always higher. It opens the field to a widening of survey techniques and, among others, to qualitative approach (focus groups, in-depth interviews with young adults) in order to explore the cognitive normative and emotional processes, that represent the background of the choices of family formation and contribute to the formation of intentions (Micheli 2006).

A consequent issue, following the discussion of the FFS results related to the balance between micro and macro studies.

It is now widely acknowledged that an exclusive emphasis on micro-approaches risks moving towards, as Coleman stated, 'demography without population' (Coleman, 2002, p. 147).

In many fields of demography a macro-component can seldom result the essence of the problem, and cannot easily be incorporated technically into model of event history analysis. The possible interactions of the macro and micro dimension could be the way in which the effects of some macro dimensions have impact on the perceptions, attitudes, behaviors and chances of individual and family now (for example national level policies, education systems, labor and housing markets can affect marriage and reproductive choices).

At the international level the new Gender and Generation Programme (GGP) has to be recalled as an effective example of the new prospective paradigm[2].

Starting by the limitations of FFS results the new programme is based on both panel survey for individual life history and contextual databases providing information on macro level factors influencing demographic trends.

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[2] The Generations and Gender Programme is a system of national Generations and Gender Surveys and contextual databases concerning European and some non- European countries (A. Vikat *et al.*, 2007).

Besides, the micro-macro perspective represents the actual innovation of research perspectives, following the hypothesis that family and individual's choices are affected by the context in which they live and their intentions and successive behavior take place.

The macro level could be defined in relation to national policies, education systems, labour and housing markets, which all create opportunity structures for individuals and families. The intermediate or meso -level can be represented by the geographical organization, as regions or sub-regional areas for which the implementation of national policies can vary. Similar roles can be played by social or other relevant groups, while household and partnership arrangements serve as relevant micro-level contexts.

All the factors located at different levels interact in shaping the relationship between genders and generations. Methodologically, those differential ties give the opportunity to apply multi –level methods of analysis.

Once again, the information needs in terms of research questions and analysis approach, which tends to the explanation of behavior, and the development of methodology, show their strong interactions.

4. THE SENSITIVITY OF A CORRECT READING OF POPULATION EVENTS COMES ALSO FROM HISTORICAL DEMOGRAPHY

Population scholars now recognize that historical demography has had a strong influence on the life course paradigm as regards the interrelationships with social and historical context. In fact, since the mid-'70s, thanks to Louis Henry's work, a historical approach has been developed that puts the lives of "ordinary" people at the center of the analysis. The demographic events, like births, deaths, marriages become the specific object of analysis, by consulting archival sources, parish and church records or other sources centered on the individual.

In Italy historical data are particularly rich and informative, and they allow a fine reconstitution of the event histories for long periods and on a medium geographical scale.

The general framework is based on the nominative link between census type sources (status animarum) and event records. The availability of continuous census - type data over time allows to sequence the cross-sectional information given by the sources, reconstructing the occurrence of events from year to year, which in turn modify the demographic characters of individuals.

The research conducted in Italy until the '90s mainly with a macro approach already allowed to describe the long trend mechanisms of the main components of population dynamics, above all fertility and mortality, and to document the existence of different models of demographic transition in our country. More overall, strong differences in mortality levels and also in reproductive behavior were documented but only at a descriptive level. Therefore the presence of heterogeneity was evident but not explained yet.

In the last decade, the Italian participation to numerous international research projects has made possible the publication of a growing number of scientific pa-

pers dealing with the micro-analytic approach on historical data. One of the most known research project is the *Eurasian Population and Family History Project*[3]. As pointed out by Pozzi (2010), to understand the core of the study it is useful to recall some part of the presentation of the first volume of the MIT Press Eurasian Population and Family History Series: «New data and new methods, meanwhile, have begun to illuminate the complexities of demographic responses to exogenous stress, economic and otherwise. Whereas Malthus and his successors focused on relationships between economic conditions and demographic behavior at the aggregate level, combined time- series and event history analyses of longitudinal, nominative, micro-level data now allow for the finely grained differentiation of mortality, fertility and other demographic responses by social class, household context, and other dimensions at the individual level. [...]. Our effort suggest that the grand narratives of classical behavioral theory overestimates the uniformity of human responses to exogenous forces. Different people, defined by age, gender, geographic location, family organization, local institutions, specific occupation, regional history, wealth, and much else, in fact responded differently to different economic constraints and opportunities. As a result, while differences by age, sex, and socioeconomic status are virtually universal in mortality responses to economic change, patterns of response by age, sex and social class differ dramatically» (Bengtsson *et al.*, 2006)

The research has shown particularly interesting results in the analysis of infant and child mortality. The treatment of biographical data with the Event History Analysis techniques allowed a more specific evaluation of the risk of an infant death depending on one hand by endogenous and biological factors and by economic and social aspects on the other. The weight of those factors on the risk seemed different in the various phases of infant life, neonatal, post –neonatal, and in the first years of life (Breschi *et al.*, 2000).

The studies on fertility and reproductive behavior seem to show intriguing results as well (Tysuia *et al.*, 2010). The attention is focused on the evolution of differential fertility and its sensitivity to changes in individual, family and environmental sphere. For Italy, the analysis has underlined the presence of a great diversity and complexity. Reproductive differentials are related to socio-economic characteristics of the family, but often the link between marital fertility and socioeconomic status differs depending on the social and territorial cohesion in different forms affecting the process of demographic transition.

With the micro-analytic approach the opportunity to test theoretical hypotheses empirically and to investigate causal relationships is strengthened considerably and brings us to the interesting question of the need to develop grand theories in demography.

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[3] The research group initially conceived the idea of a large scale-comparative project based on coordinated analyses of nominative household registers from Europe and Asia. In June 1994 Japan hosted the initial organizational meeting of the Eurasian Project in Kyoto (Bengtsson *et al.*, 2006).

5. A FINAL ISSUE

Caldwell stated that demography has always been an empirical discipline that has maintained its nineteenth-century positivistic attitudes until the end of the twentieth. He has underlined that most demographers have seldom been suspicious of other disciplines which built theoretical framework on unproven theoretical bases (Caldwell, 1996).

When discussing the results of FFS project, Dikstra and van Wissen (1999) have stressed that demography is an "object science" completely defined by its subject matter, the population, thus lacking of grand theoretical references. According to these authors we are accustomed to think that the main objects of demography include the study of three micro - behavioral domains, fertility, mortality and migration, and the manifestations of those domains at macro levels of population. The emphasis is then on measurement and number and not on theory and explanation. The criticisms rely on the fact that demography has insufficient views of its own about the basic mechanisms behind human behavior while other social disciplines have developed much knowledge on the relations between demographic events and behavior of individuals and systems.

As a matter of fact, demography has also given birth to theoretical speculations mainly at a macro-level, with a great attention to demographic and socio-economic components. Nevertheless when dealing with human behavior, it would be necessary to pay more attention to develop mid-level theories and frameworks in order to test them on empirical data.

Palloni (2002) stated that when dealing with individual behavior the key difference between demographers and other social scientists is that demographers are usually interested in the implications of those behaviors for the composition and dynamic of population. Understanding of the individual behaviors that determine events needs theories and perspectives coming from other disciplines. Nevertheless it is true that the implications of individual behavior on population composition and trends is a demographic affair.

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SUMMARY

The evolution of demographic studies. An overview from the '80s: from a macro descriptive perspective to dynamic analysis of biographies

The aim of the paper is to review the evolution of different approaches to the analysis of population data from the mid-80's of the XXth century until now. Demographers' interests and theories, says J. Caldwell (2000), depend not only on data but also on changes and evolutions that the data reveal. In the period covered by the analysis one can identify different dimensions. Among the most important we have to recall the shift of the paradigm in dealing with demographic data and measures from a macro descriptive approach to the dynamic analysis of cohorts and biographical reconstructions. An effort is made to trace the evolution of demographic studies through the major international surveys on family and reproductive behavior (FFS and GGP) underlying new needs in collecting population data in order to answer new questions on the determinants of demographic behavior, and hence the population dynamics.