



# DEMOGRAPHIC RESEARCH

*A peer-reviewed, open-access journal of population sciences*

---

## ***DEMOGRAPHIC RESEARCH***

**VOLUME 33, ARTICLE 4, PAGES 93–112**

**PUBLISHED 8 JULY 2015**

<http://www.demographic-research.org/Volumes/Vol33/4/>

DOI: 10.4054/DemRes.2015.33.4

*Editorial*

### **Explaining fertility: The potential for integrative approaches**

**Johannes Huinink**

**Martin Kohli**

**Jens Ehrhardt**

This publication is part of the Special Collection on “Theoretical Foundations of the Analysis of Fertility”, organized by Guest Editors Johannes Huinink, Jens Ehrhardt, and Martin Kohli.

©2015 Johannes Huinink, Martin Kohli & Jens Ehrhardt.

*This open-access work is published under the terms of the Creative Commons Attribution NonCommercial License 2.0 Germany, which permits use, reproduction & distribution in any medium for non-commercial purposes, provided the original author(s) and source are given credit.  
See <http://creativecommons.org/licenses/by-nc/2.0/de/>*

## Table of Contents

1	Aims and structure of the Special Collection	94
2	Constructing an integrated theory of fertility	95
2.1	Some meta-theoretical considerations	95
2.2	Complex dynamics in fertility research	98
3	The contributions to the Special Collection	102
4	Conclusion	105
	References	107

## **Explaining fertility: The potential for integrative approaches**

**Johannes Huinink<sup>1</sup>**

**Martin Kohli<sup>2</sup>**

**Jens Ehrhardt<sup>3</sup>**

### **Abstract**

#### **BACKGROUND**

A theoretical approach to explaining fertility behavior in developed countries needs an integrative perspective. As fertility behavior takes place in a multi-level setting of biological, psychological, social, economic, cultural, and political conditions, theories to explain fertility behavior need to be drawn from several academic disciplines and to address different levels of analysis.

#### **OBJECTIVE**

With this Special Collection (SC) we contribute to the discussion by giving an update on current theoretical thinking about fertility. In our introduction, we elucidate some of the challenges of explaining fertility and fertility change from an integrated, interdisciplinary perspective, and address problems of theory construction. We address possible points of departure for tackling these challenges. We then introduce the articles gathered in the SC.

#### **CONCLUSIONS**

Demographers have already presented some promising attempts at a more comprehensive model of fertility behavior and fertility trends. However, further joint efforts by scholars of the disciplines involved, both theoretically and empirically, are needed. One should continue a discussion promoting an integrated system of concepts and an exchange between the disciplines on key research questions.

---

<sup>1</sup> University of Bremen, Germany. E-Mail: [huinink@empas.uni-bremen.de](mailto:huinink@empas.uni-bremen.de).

<sup>2</sup> European University Institute, Italy & Bremen International Graduate School of Social Sciences, Germany.

<sup>3</sup> Independent researcher, Germany.

## 1. Aims and structure of the Special Collection

With this Special Collection (SC) we contribute to the discussion on theoretical approaches to explain fertility behavior in developed countries from an integrative perspective.<sup>4</sup> As fertility behavior takes place in a multi-level setting of biological, psychological, social, economic, cultural, and political conditions, theories to explain fertility behavior need to be drawn from several academic disciplines and to address different levels of analysis. Some theories have been much discussed and tested in fertility research, while other approaches still have to unfold and demonstrate their explanatory potential. Since the different approaches do not share a common framework but use specific assumptions, focus on particular aspects, and integrate different levels and dimensions of the environment, they present a need for synthesis.

Against this background, we want to accomplish three goals: (1) The SC should give an update on current theoretical thinking about fertility by including new versions of broadly established theoretical approaches as well as promising other theoretical models. (2) It should highlight how these theories contribute to the explanation of fertility behavior and shows how they complement or compete with each other. (3) It should inform about recent empirical research on fertility based on these theories.

In order to gain a structured overview of the subject, the articles are arranged according to the different levels of analysis. We distinguish between

- ◆ the evolutionary (socio-biological) level;
- ◆ the level of individual actors and their life courses;
- ◆ the level of interactions in partnerships and personal networks;
- ◆ the socio-structural, institutional, economic, and cultural conditions at the societal level.

In sum, the SC comprises nine articles plus this introduction. Each article reports on developments in the specific theory that it addresses, and details its contribution to the explanation of fertility behavior. It also briefly discusses recent research on fertility based on this approach. Furthermore, it spells out which type of research on fertility is promising from the specific theoretical perspective. Open questions and data needs are also discussed.

---

<sup>4</sup> The idea of publishing this SC dates back to a Conference on “Theoretical Foundations for the Analysis of Fertility” that took place in Lausanne, October 14-16, 2010. It was organized by the Working Group *A Future with Children: Fertility and Societal Development* of the German Academy of Natural Sciences, Leopoldina, and the Berlin-Brandenburg Academy of Sciences (for further information in German see <http://www.zukunft-mit-kindern.eu/hintergrund>).

Before we introduce the articles gathered in this SC (section 3), we shall first elucidate some challenges of explaining fertility and fertility change from an integrated interdisciplinary perspective, and address problems of theory construction (section 2). In the final section (4) we draw some conclusions.

## **2. Constructing an integrated theory of fertility**

To fully understand fertility, approaches from various academic disciplines covering several relevant dimensions have to be integrated. As a whole, they constitute a complex multi-causal model of dynamic mechanisms. Integrating these theories into a common approach is not a matter of merely assembling them. Demographers have long been aware of this challenge, and in the last decades, considerable progress has been made in this regard. Two closely related sources of complexity have to be considered: (1) the sheer number and diversity of factors and related mechanisms necessary for establishing the full multi-causal pattern of individual and aggregate fertility; (2) the recursive dynamics in the causal structure, which means that most of the relevant factors are endogenous. Let us address some of the challenges evoked by this task.

### **2.1 Some meta-theoretical considerations**

We know from nonlinear systems theory and from the study of social change that a crucial consequence of complexity is that there is no universally valid, “complete” theory to explain the dynamics of social structures over time (Boudon 1983; Helbing 2012). It is therefore not possible to make safe projections from a medium- and long-term perspective. One has to deal with uncertainty due to the high sensitivity of future trajectories to initial conditions, which can only be observed and modeled to a limited extent.

In social science, there has been a debate on how to cope with this fact. The solution proposed by the French sociologist Raymond Boudon is “the development of general and formal models, frameworks and systems of concepts which, as such, can be applied to no specific social process, but can do so, once properly specified and qualified” (Boudon 1983: 15).<sup>5</sup> In adherence to this idea, the strategy is to identify general mechanisms, which under specific conditions produce “singular” social

---

<sup>5</sup> Examples Boudon refers to, among others, are Hirschman's (1970) conceptual distinction between exit and voice, or Olson's (1965) theory of collective action. In fact, Olson's theoretical framework would also be relevant for fertility research.

outcomes in a particular historical situation at a certain place. Based on these “conceptual sets”, empirically observed social processes can be explained at least post hoc. They still do not allow reliable projections of future trends. “Regularities, trends and laws can be observed only at a *local* and/or *partial* level, in the past” (Boudon 1983: 16).

Applying this idea to fertility research, we have to look to the relevant disciplines for general models, frameworks, or systems of concepts that can be integrated in a comprehensive conceptual set. Working like a toolbox, this allows us to explain fertility outcomes and trends in terms of quantum and tempo, in specific historical periods and a specific societal context.

This may be illustrated by the attempts to explain the demographic transition in the 19<sup>th</sup> and early 20<sup>th</sup> century. The classic macro-analytical theory of the demographic transition consisted of a three (or five) step model of demographic change in industrializing countries, claiming general validity for any country once a certain stage of development is reached. In order to explain the onset of the decline in mortality rates and the following shift in fertility, it focused on structural factors such as industrialization and urbanization (cf. Notestein 1950, 1953). The general macro-analytical rationale behind the theory was “an equilibrium or homeostatic framework” (Kirk 1996: 386) highlighting the adaptive tendencies in demographic development beyond individual conscious choice, i.e., rejecting the micro-foundation that Boudon asks for.

Many counter-examples in Europe and elsewhere showed that structural change could not explain demographic change very well. The impact of cultural factors – still a macro-analytical concept – on fertility change had to be recognized much more than had been the case in the classical model (Cleland and Wilson 1987; cf. also Kirk 1996). Cleland and Wilson pointed at diverse socio-economic development levels in regions where the onset of demographic transition took place at the same time, or conversely, at regions with more or less the same developmental stage and widely differing starting points for the transformation process. The historical data collection with time series for more than 600 regional entities in Europe compiled by the Princeton European Fertility Project (Coale and Watkins 1986) impressively documents numerous deviations from the postulated rules (cf. Anderson 1986; Knodel and van de Walle 1979). There are regions, socio-structural groups, and entire societies in which economic development has clearly determined fertility reductions, whereas in other regions, cultural factors seem to have been more important for the demographic transition. This also is true for more recent demographic change, as, for example, shown by Lestaege and Neels (2002) who find striking continuities in the disparities between culturally diverse regions across Europe (cf. also Lesthaeghe 2011). Explaining the quantum and tempo of fertility at the individual and aggregate level then obviously means explaining why

particular fertility changes occurred in regions sharing some conditions, but being different in others.

Lesthaege and Neels made use of a set of concepts (in Boudon's sense) that Ansley Coale introduced 40 years ago. Dissatisfied with a pure macro-analytical approach, Coale proposed a simple, general framework within which to understand the diversity of fertility change. It consisted of three prerequisites, which had to be met before fertility change, according to the demographic transition model, could occur in a particular historical situation (Coale 1973).<sup>6</sup> According to Coale it is decisive (1) to what extent a cognitively supported ability and culturally supported permission to treat fertility as a matter of individual choice is given; (2) to what extent fertility by the individuals is (rationally) considered a matter of individual well-being over the life course and, therefore, an issue of individual decision-making under perceived opportunities and constraints; and (3) to what extent a proper technology is at hand to allow fertility-related behavioral control.<sup>7</sup> This attempt is remarkable in various respects. First, Coale addresses the conditions of individual decision-making.<sup>8</sup> Second, the prerequisites, while being of a general nature, refer systematically to three concrete dimensions assumed to be involved in fertility. Third, the three prerequisites refer to complex multi-level interdependencies, and each of them addresses a variety of micro- as well as macro-analytical, and of substantive as well as methodological issues.

Several disciplines are involved in studying the underlying mechanisms that determine to what extent these prerequisites are fulfilled and have an impact on fertility under given historical conditions. As simple as Coale's proposal appears to be, it is already powerful as part of a general framework, in Boudon's sense. That is why it is superior to classic demographic transition theories. However, Coale does not provide a clear idea of how to integrate the related strands of theory, or of the weight of each of the three dimensions in explaining fertility in a particular historical situation; he seems to assume that they are of equal importance.

This is probably not true. The strength and relative importance of factors can change over time. An interesting case is the influence of genetic variation on fertility

---

<sup>6</sup>“(1) Fertility must be within the calculus of conscious choice. ... (2) Reduced fertility must be advantageous. ... (3) Effective techniques of fertility reduction must be available. ...” (Coale 1973: 65).

<sup>7</sup> Gerhard Mackenroth already proposed a similar triad of assumptions in the 1950s. He distinguished “1. das physische Können [physical ability]; 2. das soziale Dürfen [social permission]; 3. das persönliche Wollen [personal will]” (Mackenroth 1953: 330)

<sup>8</sup> As early as 1909, the German economist Lujo Brentano had already formulated a multi-level theory of fertility decline based on rational action for what was later called the Demographic Transition, which in many respects, anticipated core arguments of later theories by drawing on ideas from demography, economics, sociology and psychology.

behavior and decision-making.<sup>9</sup> Kohler et al. (1999, 2006) show that genetic variation plays a minor role in societies or groups with strong social control or behavioral norms. This is the case in most traditional societies characterized by powerful sexual and family norms and gender roles. It is in contrast to liberal modern societies or times of rapid behavioral change, in which individuals are more easily able or allowed to follow individual preferences. There is therefore more room for individual genetic predispositions to influence decisions and behavior – such as the timing of family formation.

## **2.2 Complex dynamics in fertility research**

For a given historical context, trends and patterns in macro-analytical demographic processes ultimately have to be explained by interdependent processes on the micro-level. This is also true for fertility research. One consequence is that an empirical assessment of theoretical approaches or an evaluation of policy programs fails if it tries to isolate the impact of single factors instead of reconstructing impact chains.

A simple source of complexity is that fertility as an outcome is at the same time an influencing factor of further fertility. Moreover, this is also true for many of the other factors affecting fertility behavior. The result is strong path dependence and self-referentiality in the social processes with which we are concerned. Having children affects further fertility by influencing opportunity structures and individual attitudes in men's and women's lives. Aggregated patterns of fertility are also self-referential in the sense of being eventually the result of the individual behavior of men and women living in specific regions at a certain point in time, and, at the same time, influencing further fertility behavior.<sup>10</sup> Self-referentiality implies feedback loops. The so-called “low fertility trap” hypothesis is one example of considering ongoing fertility decline as a consequence of a feedback loop (Lutz, Skirbekk, and Testa 2007). The assumption is that declining family size and increasing childlessness will lead to corresponding changes in cultural values and norms related to having children. This will lead to even higher rates of childlessness and to even smaller family sizes, and so on. As we know today – at least in Western countries – this hypothesis has not been confirmed. Fertility

---

<sup>9</sup> In the last two decades, bio-demographic approaches have gained considerable attention in demographic research on fertility (cf. Wachter and Bulatao 2003). Evolutionary biology of human fertility and life history theory, in particular, are of interest (e.g., Kaplan et al. 2000; Kaplan and Gangestad 2005; Lawson 2011; see Mace in this SC).

<sup>10</sup> Notestein modified his theory in 1950 accordingly. Whereas previously he “treated fertility rate as a dependent variable, reflecting a culture’s social and economic development, now he suggested that reducing fertility might be a necessary condition for such development” (Connelly 2008: 138).

rates in the countries where the fertility trap should be apparent have instead increased again (Myrskylä, Kohler, and Billari 2009; Goldstein et al. 2013). To some extent this phenomenon is, however, just the effect of the trend of increasing age at first birth coming to an end (Bongaarts and Sobotka 2012). It is a matter of empirical research to identify societal conditions under which such a feedback loop driving fertility to very low figures might occur.

Feedback loops can be conceived as one kind of path-dependent processes. Path dependence plays a major role in fertility dynamics (cf. Johnson-Hanks et al. 2011: 27ff). Lesthaeghe and Neels (2002) find evidence of remarkable continuities in the disparities of fertility patterns and living arrangements among European regions during the last century. However, fertility trends may switch to alternative pathways, which – possibly supported by new social institutions – are stabilized again for a certain period of time. According to Ebbinghaus (2005), a “trodden trail” due to strong path dependence may end at a “critical juncture” with “branching pathways”. A new direction of development may be taken which is often difficult to anticipate. It is also difficult to distinguish effects of path dependence from the impact of current circumstances – in the individual life course as well as in macro-analytic trends in geographical regions or societies (Huinink and Feldhaus 2009: 314).

Considering consequences of self-referentiality on the micro-level directs attention to two other related concepts: selection and adaptation (Lesthaeghe 2002; Huinink and Feldhaus 2009). On the one hand, individual intentions, values, and aspirations are a source of selectivity with regard to short- and long-term fertility behavior, but also with regard to other aspects of life such as choosing social environments and social network partners. On the other hand, it is likely that intentions, values, or aspirations are adapted to the outcome of fertility and family dynamics, or to shifts in other parts of the life course. This is a consequence of avoiding cognitive dissonance when an exit option is not available or is very costly (Kuran 1998).

Other concepts in the study of complex nonlinear dynamics are threshold and floor effects. These effects play a central role in some theories of fertility, e.g., in diffusion theory or evolutionary anthropology. They represent specific nonlinear connections between impact factors and outcomes. Hirschman gives an example of a floor effect: “one or two children might be desired even if the costs of children are very high” (Hirschman 1994: 221). This happened, for example, in East Germany after unification. The rapid transformation “made long lasting decisions to have a child troublesome. But besides the negative social context, the overwhelming majority of couples and individuals decided to have at least one child. The population in Eastern-Germany accepted a burden clearly above average to bring up at least one child” (Hirschman 1994: 221).

From a “biosocial” perspective, Foster proposes a floor effect with regard to future fertility levels in low-fertility countries. Her “basic hypothesis ... is that low fertility in post-transitional societies is unlikely to fall any lower because women have a biologically-based predisposition toward nurturing or maternal behavior that interacts with environmental stimuli, resulting, in most cases, in a conscious motivation for bearing at least one child” (Foster 2000: 214). It remains to be seen whether this hypothesis will stand the test of time. Floor effects have consequences for the construction of adequate research designs and give reason to model fertility decisions differently by different parity.

Threshold models work similarly, but the logic goes in the opposite direction. In this case, cultural or economic factors affect fertility only if their strength exceeds a certain level. The classic example is the diffusion (or evolution) of ideas. It is necessary to distinguish between “forerunners” or pioneers and “followers”, and the decision process of these two groups is very different. Several models in nonlinear systems theory may be applied in this context (Granovetter 1978; Kohler 2001). Agent-based modeling promises to be a methodical approach to simulate such processes, and dynamics of high complexity in general (Billardi et al. 2006; Helbing 2012).

Finally, what makes the analysis of causal mechanisms difficult is that one usually has to deal with long time delays regarding potential causes and effects.<sup>11</sup> Cultural, social, economic, demographic or political changes are likely to follow different time scales, and the interdependencies between them are not yet well understood. To which extent and after what time span

- ◆ do individuals react to changes in their opportunity structure?
- ◆ do institutions react to emerging behavioral patterns in the population?
- ◆ do individuals and institutions promote and follow new “cultural goals” (Merton 1968) as accepted purposes and aspirations in individual welfare production?
- ◆ do structural and cultural changes follow different mechanisms and schedules of transformation?

In this section we have tried to direct attention to some challenges of integrated fertility theory construction. We have addressed possible points of departure for

---

<sup>11</sup> In this sense, Mason (1997), e.g., asks whether “the test of classical transition theory provided by the Princeton project [was] fair ... By choosing a decadal time scale and using a regression-type framework for testing the theory, the project implicitly assumed that the effects of economic modernization on fertility would be felt immediately, regardless of other conditions. ... However, there is every reason to expect loose temporal connections between the structural or ideological changes that may underlie fertility transitions and the onset of these transitions” (Mason 1997: 449).

tackling these challenges following Boudon's general and formal models, frameworks and systems of concepts. We have not been very explicit and by no means comprehensive in this regard. Our goal was to show that such a strategy could help integrate approaches from different disciplines and fields of fertility research. The contributions to the Special Collection offer models that can fill the empty boxes of such a conceptual schema.

We refer above to classical attempts at designing a general framework (Coale 1973), and to an example of using it in the context of the Second Demographic Transition approach (Lesthaeghe and Neels 2002). A more complex and promising attempt at constructing an interdisciplinary framework has recently been published by Jennifer Johnson-Hanks and colleagues introducing what they call a “theory of conjunctural action” (Johnson-Hanks et al. 2011). It takes up many of the challenges considered in the previous sections. The authors start from a broad multilevel concept of “structure” as “the recurrent patterning of social life” (Sewell 1992) distinguishing between a schematic dimension (cultural and cognitive or mental) and a material dimension (objects, performances, and organizations). Both dimensions are strongly interrelated or – as the authors call it – “interacting” with each other. Situational configurations of structural elements (“conjunctions”) and more so their subjective perception by the individuals (“construals”) are the basis for explaining individual action in general, and fertility in particular. This understanding of a multilevel, multidimensional structure and its path-dependent dynamics allows for conceptually integrating theories from different disciplines addressing different structural elements and their change over time. This program encompasses cognitive structures and processes as studied in neuroscience and psychology as well as social networks and macro-level sociocultural patterns as studied in the social sciences. The contributions to this Special Collection could well be seen as fertilizing or complementing such an integrative approach – and vice versa.<sup>12</sup>

---

<sup>12</sup> Using this theoretical approach, Bachrach and Morgan (2013) address the concept of fertility intentions and discuss the model of Fishbein and Ajzen (2010). They show how borrowing insights from cognitive science and neuroscience leads to a better understanding of fertility intentions and their relevance for fertility behavior. The authors question the assumption that fertility behavior is always preceded by conscious behavioral intentions (see also the contribution by Ajzen and Klobas in this SC).

### 3. The contributions to the Special Collection

As stated above, the Special Collection proceeds from the evolutionary (socio-biological) level through individual action, partnership and personal networks to societal conditions and their changes over time. We have ordered the contributions according to this logic and briefly present them here in this order.

*Ruth Mace* demonstrates the potential of an evolutionary approach to fertility by asking why there is (under some conditions) low fertility, or no fertility at all. She discusses three key areas where this occurs: homosexuality, menopause (in other words, female sterility in old age), and the changes usually termed as demographic transition. All three states seem to challenge the basic tenets of evolutionary theory; showing that they can indeed be accommodated by an evolutionary framework is thus a strategic test for the latter and a good illustration of how it operates. Evolutionary demography may be understood as an application of life history theory to population processes, focusing on the timing of life events (including those of reproduction) under given ecological constraints. It thus needs to be integrated with theories of societal and cultural change. Evolutionary models are similar to those of economics, but differ from them by positing reproductive success as the ultimate selection criterion.

As for individual decision-making and behavior, there is a major debate on the extent to which fertility is a matter of rational reasoning and to which it is directed by non-rational motivations or culturally shaped values and norms. In this Special Collection, four approaches to action-theoretic modeling are presented as a theoretical basis to explain fertility decision-making. They follow different perspectives. Three of them already have a longer tradition in fertility research but draw on general models of human action (economic family theory, value of children theory, theory of planned behavior). The fourth (ecological rationality) has not yet been applied to fertility analysis as such, but is offered here as an interesting alternative.

A theoretical tradition that has been very present in fertility research over the past decades is the economic theory of the family. Starting from classical economic contributions to fertility, *Martin Werding* presents new approaches that are still based on the assumption of rational decision-making but go beyond Becker's (1991) unitary model. He discusses bargaining models, approaches focusing on the interdependence between labor force participation and having children, and approaches which acknowledge the relevance of social context and the multi-dimensionality of returns to children (already proposed, e.g., by Leibenstein 1957). In his conclusion, Werding makes a plea for the development of an interdisciplinary theory of fertility that would pay particular attention to a longitudinal view of fertility decision-making and to the increasing diversity of lifestyles. Economic thinking and concepts would make an indispensable contribution to such a theory.

The Value-of-Children Theory (VOC) shares some common ground with the economic approaches. *Bernhard Nauck* presents it in a reformulated version drawing on concepts from the Theory of Social Production Function (SPF) developed by *Lindenberg* (cf. *Lindenberg and Frey 1993*). The VOC approach is especially prominent in cross-cultural studies of fertility. It assumes that children can make short-term and long-term contributions to different dimensions of individual wellbeing – economic wellbeing, social approval, and emotional wellbeing. In this sense, children provide goods that human beings strive for (cf. again *Leibenstein 1957*). A variety of hypotheses can be deduced from this approach, depending on how central intergenerational support is for the wellbeing of parents. A series of empirical studies show that the VOC approach is quite successful in explaining international differences in fertility by focusing on how socio-structural, institutional, and cultural patterns shape the particular “instrumentality” and “efficiency” of having children as means of satisfying needs. *Nauck* also discusses possible ways to improve the value of the VOC approach for explaining social change in fertility decision-making and respective processes of individual self-regulation by referring to recent studies by *Lindenberg (2008)*.

*Icek Ajzen and Jane Klobas* apply the Theory of Planned Behavior (TPB) to fertility, assuming that fertility in developed countries is now more a matter of intention than just a matter of course (cf. *Coale 1973*). The TPB focuses less on the intention of performing a particular behavior but more on the intention of achieving a certain goal, in this case, of having a child. It explains fertility intentions by three groups of factors: attitudes towards having a child, subjective norms (beliefs in social approval) of having a child, and perceived control over goal achievement. Compared to earlier versions of the TPB, *Ajzen and Klobas* put particular emphasis on background factors that influence these beliefs, i.e., personality traits, socio-economic characteristics and cultural influences. It is essential for the predictive power of the model that the beliefs be closely related to the specific goal, e.g., having a child within the next two years. As the attitudes, subjective norms and control beliefs with regard to having a child might not be exclusively rational, the authors do not classify the TPB as a version of rational choice theory. They assume, however, that intending to have a child is perceived by the potential parents as a consistent consequence of their beliefs. This is close to what *Boudon* calls cognitive rationality (*Boudon 2003*). The authors also discuss the ways in which the TPB can be operationalized in the case of fertility intentions, and present an exemplary analysis based on data from the Gender and Generation Survey in different European countries, focusing again on the relevance of background factors, such as age.

In contrast to economic thinking are the models of individual decision-making and behavior from the viewpoint of “ecological rationality” presented by *Peter M. Todd, Thomas T. Hills and Andrew T. Hendrickson*. Drawing a connection to the concept of

bounded rationality introduced by Simon (1990), they assume that individual action is usually the result of efficient step-by-step decision mechanisms driven by simple heuristics and situation-related patterns. Previous experience and adaptation leads to an “adaptive toolbox of different simple heuristics” which can be applied in other environmental settings and allows the actor to avoid major efforts of complex reasoning. The authors show how this approach works in simulation models in the case of choice of mate – a complex situation, because more than one decision maker is involved. Another example is parents’ investment in children. Based on these studies the authors argue that the approach is well suited for fertility decisions as well.

Fertility is usually a matter of decision-making by two individuals. This fact has been neglected in past theory and research. *Petra Stein, Sebastian Willen and Monika Pavetic* discuss the theoretical implications of couples' decision-making and present a way of modeling it in an empirical analysis. They assume that fertility decisions are preceded by social interaction and negotiation and formulate a number of hypotheses on the logic or “rules” these interactive decision processes might follow, and on their consequences for the incidence and timing of having a child. They offer a dyadic analysis using data from the German Family Panel (cf. Huinink et al. 2011). Findings from their complex multivariate model support the assumption that the characteristics and dispositions and attitudes (e.g., perceived value of children) of the female partner have a stronger impact on the fertility decision. Moreover, the male partner's dispositions are more influenced by those of the woman than the other way round. Interestingly, one important factor on the male partner's side concerns the stability of the partnership – the higher it is, the lower his desire for a child.

Individuals and couples exist in a social environment. Here the contribution by *Laura Bernardi and Andreas Klärner* comes in. They discuss processes of social learning, social pressure, social contagion and social support as relevant mechanisms through which social relationships with others may impact an individual's or couple's fertility intention and behavior (cf. Kohler 2001). The authors show that the effects due to these mechanisms strongly depend on the strength and emotional quality of social ties and the structure of the wider social network in which the relationships are embedded. The large body of literature on social network effects on fertility published in the last couple of decades corroborates their assumptions. However, they have reason to conclude that we still do not know enough about the magnitude of these effects, and about when and how social networks function as an interface between individuals and societal institutions and structures. Finding the precise mechanisms requires more longitudinal research. On this background, the authors discuss the place of the social network approach in an integrated theory of fertility and the specific conceptual contributions it has to offer.

*Peter McDonald* has developed an influential approach to the institutional framework of fertility. His core assertion is that fertility levels in modern societies depend on the level of incongruence between gender equity in the family sphere and gender equity in education and the labor market. He prefers the concept of gender equity over that of gender equality as the former allows different outcomes for men and women but requires the outcomes to be fair. Given the increasing capacity of women to be successful in the labor market, fertility should be higher in a country where women anticipate sufficient support in combining motherhood and work and a fair sharing of the opportunity costs of having children between both partners. McDonald provides a rationale for testing the gender equity hypothesis, and concludes that institutional support allowing highly educated women to have children at low opportunity costs is the key to a sustainable level of fertility.

The life course approach presented by *Johannes Huinink und Martin Kohli* is as yet more a conceptual scheme than a full-blown theory. It offers a strategy to account for life course complexity by identifying three major sources of interdependence: that between different extra- and intra-individual levels of analysis, that between the different life domains, and that between the past and the future. This strategy is complemented by a model of individual behavior and decision-making building on assumptions about basic goals and assets of individual wellbeing. The authors apply this approach to the quantum and tempo aspect of fertility and parental investment, and give an overview over the recent research literature. They argue that the life course approach could well be a point of departure for an integrated theory of fertility.

## 4. Conclusion

This Special Collection is far from covering the whole range of relevant approaches to fertility theory that have arisen in the last decades and would have to participate in this enterprise. Its aspiration is to initiate a discussion promoting an integrated system of concepts in Boudon's sense and an exchange between the disciplines on the key research questions. We have shown that demographers have already presented some promising attempts towards a more comprehensive model of fertility behavior and fertility trends, and have referred to the ambitious framework for "understanding family change and variation" by Jennifer Johnson-Hanks et al. (2011). Their project explicitly "aims at *consilience*" and the authors write: "In its purest sense, consilient science begins with the most fundamental insights relevant to a problem from all disciplines, and integrates these in new models that transcend disciplinary frames, building theory from the ground up when necessary" (Johnson-Hanks et al. 2011: 23).

Indeed, there is not “one master cause of all fertility transitions”, and the claim for an ubiquitous theory “can be destroyed by discovering a single exception” (Mason 1997: 446; cf. Boudon 1983). However, we may start with simple assumptions such as those proposed by Coale forty years ago, and differentiate them by a systematic integration of concepts drawn from the various disciplines that directly or indirectly address human fertility. This needs further joint efforts by scholars of the disciplines involved, both theoretically and empirically. The quality of available data sets in which to study the complex processes connected to fertility has considerably improved in the last two decades, and with it, the possibilities for adequate statistical testing. The enterprise of theory construction can therefore be founded on a much more solid empirical base than it could be in the past.

## References

- Anderson, B.A. (1986). Regional and Cultural Factors in the Decline of Marital Fertility in Western Europe. In: Coale, A.J. and Watkins, S.C. (eds.). *The Decline of Fertility in Europe*. Princeton: Princeton University Press: 293–313.
- Becker, G.S. (1991). *A Treatise on the Family*. Cambridge: Harvard University Press.
- Bachrach, C.A. and Morgan, S.P. (2013). A Cognitive-Social Model of Fertility Intentions. *Population Development Review* 39(3): 459–485. doi:10.1111/j.1728-4457.2013.00612.x.
- Billari, F.C., Fent, T., Prskawetz, A., and Scheffran, J. (eds.) (2006). *Agent-Based Computational Modelling. Applications in Demography, Social, Economic and Environmental Sciences*. Heidelberg: Physica-Verlag. doi:10.1007/3-7908-1721-X.
- Bongaarts, J. and Sobotka, T. (2012). A Demographic Explanation for the Recent Rise in European Fertility. *Population and Development Review* 38(1): 83–120. doi:10.1111/j.1728-4457.2012.00473.x.
- Boudon, R. (1983) Individual Action and Social Change: A No-Theory of Social Change. Hobhouse Memorial Lecture. *The British Journal of Sociology* 34(1): 1–18. doi:10.2307/590605.
- Boudon, R. (2003). Beyond Rational Choice Theory. *Annual Review of Sociology* 29: 1–21. doi:10.1146/annurev.soc.29.010202.100213.
- Brentano, L. (1909). Die Malthussche Lehre und die Bevölkerungsbewegung der letzten Dezennien. *Abhandlungen der historischen Klasse der Königlichen Bayerischen Akademie der Wissenschaften* 24: 565–625.
- Cleland, J. G. and Wilson, C. (1987). Demand Theories of the Fertility Transition: An Iconoclastic View. *Population Studies* 41: 5–30. doi:10.1080/0032472031000142516.
- Coale, A.J. (1973). The Demographic Transition Reconsidered. In: International Union for the Scientific Study of Population (IUSSP). *Proceedings of the International Population Conference 1973*. Liège: Editions Ordina: 53–73.
- Coale, A.J. and Watkins, S.C. (eds.) (1986). *The Decline of Fertility in Europe: the Revised Proceedings of a Conference on the Princeton European Fertility Project*. Princeton: Princeton University Press.

- Connelly, M. (2008). *Fatal Misconception: The Struggle to Control World Population*. Cambridge: The Belknap Press of Harvard University Press.
- Ebbinghaus, B. (2005). Can Path Dependence Explain Institutional Change? Two Approaches Applied to Welfare State Reform. MPIfG Discussion Paper 05/2. Cologne: Max Planck Institute for the Study of Societies.
- Fishbein, M. and Ajzen, I. (2010). *Predicting and Changing Behavior: The Reasoned Action Approach*. New York: Psychology Press.
- Foster, C. (2000). The Limits to Low Fertility: A Biosocial Approach. *Population and Development Review* 26(2): 209–234. doi:10.1111/j.1728-4457.2000.00209.x.
- Goldstein, J., Kreyenfeld, M., Jasilioniene, A., and Karaman Örsal, D. (2013). Fertility Reactions to the “Great Recession” in Europe: Recent Evidence from Order-specific Data. *Demographic Research* 29: 85–104. doi:10.4054/DemRes.2013.29.4.
- Granovetter, M. (1978). Threshold Models of Collective Behavior. *The American Journal of Sociology* 83(6): 1420–1443. doi:10.1086/226707.
- Helbing, D. (2012). *Social Self-Organization*. Berlin, Heidelberg: Springer. doi:10.1007/978-3-642-24004-1.
- Hirschman, A. (1970). *Exit, Voice and Loyalty*. Cambridge: Harvard University Press.
- Hirschman, C. (1994). Why fertility changes. *Annual Review of Sociology* 20: 203–233. doi:10.1146/annurev.so.20.080194.001223.
- Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., and Feldhaus, M. (2011). Panel Analysis of Intimate Relationships and Family Dynamics (pairfam) - Conceptual Framework and Design. *Zeitschrift für Familienforschung [Journal of Family Research]* 23(1): 77–101.
- Huinink, J. and Feldhaus, M. (2009). Family Research from the Life Course Perspective. *International Sociology* 24(3): 299–324. doi:10.1177/0268580909102910.
- Johnson-Hanks, J., Bachrach, C.A., Morgan, S.P., and Kohler, H.-P. (2011). *Understanding Family Change and Variation: Toward a Theory of Conjunctural Action*. Dordrecht, Heidelberg, London, New York: Springer. doi:10.1007/978-94-007-1945-3.

- Kaplan, H.S. and Gangestad, S.W. (2005). Life History Theory and Evolutionary Psychology. In: Buss, D.M. (ed.). *Handbook of Evolutionary Psychology*. New York: Wiley: 68–95.
- Kaplan, H.S., Hill, K., Lancaster, J., and Hurtado, A.M. (2000). A Theory of Human Life History Evolution: Diet, Intelligence, and Longevity. *Evolutionary Anthropology* 9(4): 156–185. doi:10.1002/1520-6505(2000)9:4<156::AID-EV AN5>3.0.CO;2-7.
- Kirk, D. (1996). Demographic Transition Theory. *Population Studies* 50: 361–387. doi:10.1080/0032472031000149536.
- Knodel, J. and van de Walle, E. (1979). Lessons from the Past: Policy Implications of Historical Fertility Studies. *Population and Development Review* 5(2): 217–245. doi:10.2307/1971824.
- Kohler, H.-P. (2001). *Fertility and Social Interaction: An Economic Perspective*. Oxford: Oxford University Press. doi:10.1093/0199244596.001.0001.
- Kohler, H.-P., Rodgers, J.L., and Christensen, K. (1999). Is Fertility Behavior in Our Genes? Findings from a Danish Twin Study. *Population and Development Review* 25(2): 253–288. doi:10.1111/j.1728-4457.1999.00253.x.
- Kohler, H.-P., Rodgers, J.L., Miller, W.B., Skytthe, A., and Christensen, K. (2006). Bio-social Determinants of Fertility. *International Journal of Andrology* 29(2): 46–53. doi:10.1111/j.1365-2605.2005.00606.x.
- Kuran, T. (1998). Social Mechanisms of Dissonance Reduction. In: Hedström, P. and Swedberg, R. (eds.). *Social Mechanisms: An Analytical Approach to Social Theory*. New York: Cambridge University Press: 147–171. doi:10.1017/CBO9780511663901.007.
- Lawson, D.W. (2011). Life History Theory and Human Reproductive Behaviour. In: Swami, V. (ed.). *Evolutionary Psychology: A Critical Introduction*. Oxford: Wiley-Blackwell: 183–214.
- Leibenstein, H. (1957). *Economic Backwardness and Economic Growth*. New York: John Wiley.
- Lesthaeghe, R. (2002) *Meaning and Choice: Value Orientation and Life Course Decisions*. The Hague, Brussels: NIDI/CBGS Publication.
- Lesthaeghe, R. (2011). The Second Demographic Transition: A Conceptual Map for the Understanding of Late Modern Demographic Developments in Fertility and Family Formation. *Historical Social Research* 36(2): 179–218.

- Lesthaeghe, R. and Neels, K. (2002). From the First to the Second Demographic Transition. An Interpretation of Spatial Continuity of Demographic Innovation in France, Belgium and Switzerland. *European Journal of Population* 18(4): 325–360. doi:10.1023/A:1021125800070.
- Lindenberg, S. (2008). Social Rationality, Semi-Modularity and Goal-Framing: What Is It All About? *Analyse & Kritik* 30(2): 669–687.
- Lindenberg, S. and Frey, B.S. (1993). Alternatives, Frames, and Relative Prices: A Broader View of Rational Choice Theory. *Acta Sociologica* 36: 191–205. doi:10.1177/000169939303600304.
- Lutz, W., Skirbekk, V., and Testa, M.R. (2007). The Low-Fertility Trap Hypothesis: Forces that May Lead to Further Postponement and Fewer Births in Europe. *Vienna Yearbook of Population Research* 4: 167–192.
- Mackenroth, G. (1953). *Bevölkerungslehre. Theorie, Soziologie und Statistik der Bevölkerung*. Berlin: Springer. doi:10.1007/978-3-642-85754-6.
- Mason, K.O. (1997). Explaining Fertility Transitions. *Demography* 34(4): 443–454. doi:10.2307/3038299.
- Merton, R.K. (1968). *Social Theory and Social Structure*. New York: Free Press.
- Myrskylä, M., Kohler, H.-P., and Billari, F.C. (2009). Advances in Development Reverse Fertility Rate. *Nature* 460(7256): 741–743. doi:10.1038/nature08230.
- Notestein, F.W. (1950) The Population of the World in the Year 2000. *Journal of the American Statistical Association* 45(251): 335–345. doi:10.1080/01621459.1950.10501128.
- Notestein, F. (1953). Economic Problems of Population Change. In: *Proceedings of the Eight International Conference of Agricultural Economics*. London, England: Oxford University Press: 13–31.
- Olson, M. (1965). *The Logic of Collective Action: Public Goods and the Theory of Groups*. Cambridge: Harvard University Press.
- Sewell, William H., Jr. (1992). A Theory of Structure: Duality, Agency, and Transformation. *American Journal of Sociology* 98(1): 1–29. doi:10.1086/229967.
- Simon, H. (1990). Invariants of Human Behavior. *Annual Review of Psychology* 41: 1–19. doi:10.1146/annurev.ps.41.020190.000245.

Wachter, K.W. and Bulatao, R.A. (eds.) (2003). *Offspring: Human Fertility Behavior in Biodemographic Perspective*. Washington, D.C.: The National Academies Press.

