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On heuristics, theoretical foundations, accounting schemes and theories☆

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For more than four decades life course research was framed and fostered by the heuristic principles which Elder (1994) formulated as the *life course paradigm* (life course development: age-graded roles; interdependency: linked lives; context: time and place; and agency). Later authors developed and refined these heuristics: institutionalized sequence of positions, life domains, multi-level and self-reflexive action (Mayer & Huinink, 1994). The propagation of the *life course paradigm* then obviously succeeded in bringing a longitudinal and developmental perspective into many substantive areas beyond aging, particularly family formation, educational trajectories and work lives. These heuristics amount to a kind of sign posts which require to pay attention to transitions and longer-term trajectories as well as their relational and historical contexts. Empirical studies then often served as an illustration that it is worthwhile to complement and replace cross-sectional and static observations by dynamic ones. While the merit and fruitfulness of the *life course paradigm* can hardly be overrated, it has, however, become clear that such heuristics alone increasingly prohibit the advancement of the field. What we are lacking are the development of testable theories, the corroboration of hypotheses and an inventory of key empirical findings. What we are also often lacking is a sense of the relative weight of the life course variance in comparison with differences across historical time and differences between countries (Mayer, 2015; Van Winkle & Fasang, 2017). In other words, we often have been admonished to look for changes across the life course while the counterpostulate of (relative) stability has been given much less attention. Moreover, more than other fields life course research was and is analytically – in regard to its basic concepts and questions – selectively defined by its respective dominant methods: biographical narratives, age-period-cohort analysis, event history analysis and sequence analysis.

It is therefore important and timely that Laura Bernardi, Johannes Huinink and Richard Settersten took the initiative to look at and map New Frontiers in Life Course Theories and Methods. For both a prior conference and this volume, they have assembled a series of original contributions. In this commentary I will mostly concentrate on the question of "theoretical advances."

The most important paper of the volume is by the editors themselves: "The Life Course Cube: A Tool for Studying Lives." They claim that the *Life Course Cube* is more than the conventional heuristic principles and more than a "framework," not a general theory, but a theoretical foundation "to guide the development of life course research and its integration across disciplines." Indeed, they are succeeding in making much more than just a "promising step towards mastering the significant complexity of contemporary life courses." How are they doing it? Their *life course cube* has three dimensions: time, levels (intra-individual, individual, supra-individual) and domains. An action/agency-theoretical construction of the individual (as a welfare producer) dwells on the Beletage, the organism and the (psychological) person share the souterrain, and anything above the individual (relations and networks, society, culture) inhabits the loft. For each of the three dimensions they postulate first order interdependencies (past-present-future; inter-domain and multilevel). First-order time aspects relate to specifying the functional form of time and aspects of action (path dependency, anticipation and turning points), first-order domain interdependency postulates connections across domains, such as qualification requirements for jobs. And first order level connections connect, for instance, psychic resources (sublevel) and institutional constraints (supralevel) such as entrepreneurial motivation and entrepreneurial opportunities.

The logical construction of the life course cube is convincing, but the derived first-order dependencies seem unfortunate and flawed in one respect. The time axis is something analytically different from the other two dimensions. Time (as one should know from Kant) is just a marker, it is empty. Levels and domains are substantive; time is not, or at least not in the same way. A first order time-related life course dependency is always one in at least one domain. One cannot formulate a life course research question or hypothesis without specifying at least one substantive domain plus time. Time might therefore be more fruitfully constructed as the basis of all first order interdependencies. It makes little sense, for example, to mark the *cross-sectional* interdependencies between levels and between domains as the corner stone of a theoretical foundation for the life course. Apart from that logical fault the life course cube works well and that fault could easily be corrected: as first order interdependencies, then, we should denote changes in any given domain on the individual level, the intra-individual level and the collective level such as occupational careers, cognitive development and economic growth. Consequently, second order interdependencies can then be formulated as inter-domain effects

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across life time, and inter-level interaction across life time.

The above weakness has also the curious consequence that probably the most important set of research questions, namely those in relation to single domain time interdependencies – at least in the specified set of x-order interdependencies – somehow fall out of focus. The present construction works well in regard to the interaction of time and levels (e.g., organismic aging on the sub-individual level and socio-cultural change at the supra-individual level.) It also prompts the authors to take up explicitly the interdependencies of the time axis with multiple domains (such as the impact of careers on fertility). But paying explicit attention to the interaction of single domains and time could have led to more attention to the aspect that there are multiple time-clocks (Featherman & Petersen, 1986) not only between levels but also within domains. Almost each domain can have its own time. Not only - as the authors acknowledge - is the timing of *functional aging* often different from chronological age since birth. Work lives start with entry into the labor market. Unions with entry into marriage or non-marital unions, etc. Not least the life course cube in its present formulation neglects *historical* time and thus actually falls even back behind the age/period/cohort accounting model of demography.

On might therefore ask whether a fundamental life course cube should not have five instead of three dimensions: not only life time, domains, and levels, but also historical time (cohort) and nations/populations (Mayer, 2015).

But let me emphasize that, despite these criticisms, the life course cube must be appreciated as a major step forward in developing life course theory.

First of all, it is a great tool for specifying research questions and seeing them in their contexts. Second, the life course cube is highly productive in suggesting hypotheses on multiple life trajectories, their complex interwoven pathways and is a formidable toolbox for suggesting causal relationships and outcomes. And the authors already go a long way in formulating a number of such hypotheses. Third, the Appendix constitutes a heroic effort to formalize the complex processes unfolded in the life course cube. This, I believe, is a great achievement, not least – as the authors emphasize – in bringing disciplinary approaches into a common theoretical construct. Where the authors are less courageous is in regard to the issue whether a more general theory of the life course is possible or even desirable. They already discuss a number of such fairly general theories: human capital theory on investments, discounting and outcomes in economics, selective optimization with compensation and primary/secondary control in psychology, the life cycle theory of the tradeoffs between reproduction and longevity in biology as well as Gossen's law of maximizing investments of time and resources in more than one life domain. For the first two it has already been shown that they are analogous, if not identical (Behrman, 2003), the life cycle theory of reproduction and longevity also relates to investments and trade-offs and could therefore be integrated. The authors' own significant contribution in this direction is the formulation of a general *action* theory of the life course (they call it a *behavioral* theory, but why?): "… actors try to improve, or at least maintain, aspects of their physical and mental wellbeing over time, all the while avoiding considerable losses … they try to achieve as much certainty as possible on what to do or to look for …". Actors are informed by their past biographical experience – the 'shadows of the past,' current circumstances and the anticipation of the future (Bernardi, Huinink, & Settersten, 2018).

I see several theoretical challenges here. One is that a general action theory of the life course is obviously given almost exclusive primacy here. It is as if Max Weber would have stopped at even a selection of his ideal types of action without proceeding then to a theory and inventory of institutions and his powerful views on societal and cultural historical development. In other words, the challenge is – among all else – to develop a theory of when and under which (institutional/cultural) conditions a) the *individual* actor became the overriding historical subject, and b) when and under which (institutional/cultural) conditions the individual *biography* becomes the main point of reference.

The paper by Bidart provides a welcome illustration of how the self-reflecting, purposive and anticipating actors of Bernardi et al.'s general theory navigate their "life cubes", especially if unexpected circumstances intervene from other life domains and other levels. Their empirical findings from three rare ten-year qualitative longitudinal studies in France, Canada and Argentina testify to the fruitfulness of casting such findings within the framework of the life cube. Apart from their illustrations from individual life histories they also looked at the distribution of how life courses change due to the interaction between life domains: out of 97 interferences of career plans due to non-work influences 31 were related to the "romantic" domain such as life choices of partners, 24 related to family such as parents in need, 13 were due to residential choices and 10 to non-family and non-partners networks. This draws attention that more is involved here than the formal interaction between life domains, namely something which was captured well in Elder's heuristic principle of "linked lives." So, we might have to imagine something like "linked life cubes" to do justice to the overwhelming salience of social relations.

A powerful explication and application of the Life Course Cube is also provided by the paper of Marlis Buchman and Jutta Heckhausen, "Towards a Comprehensive Multi-Disciplinary Life-Course Framework: Life-Course Agency, Status Transitions and Path Dependency." Well-developed psychological theories on motivation and action regulation offer a rich tool box for bringing the idea of agency to life: expectancies, action phases: goal setting, goal engagement and disengagement phases and more. Building on epigenetics and political science they employ the notion of path dependency and the role of psychological dispositions at crucial branching points. The macrolevel is brought in by the historical context, social institutions with their embedded status transitions and the structure of social inequalities. These scenarios allow Buchmann and Heckhausen then to unfold the dynamic interplay between life course, social structure and individual agency, i.e., to understand which agency components matter to what degree under which macro-contextual conditions.

"Agency" is not constant across the life course, it is highly salient when paths have to be selected, transitions have to be coped with, or deviations are to be corrected and compensated. It is less required and mobilized when routine paths and careers are followed. Action has to be "on time" for time related transitions. Expectancies and goal setting do not occur in a vacuum, but are shaped by institutionalized tracks.

Finally, where persons can go to is defined by the starting point of the family of origin. But (parental) aspirations can play a heavy role here. Migrant families are often overambitious for their children and upper middle class parents succeed to place their less talented children in advanced upper secondary schools despite contrary teacher recommendations.

Buchmann and Heckhausen introduce the very useful concepts of developmental path dependency and institutionalized path dependency as two major partially independent, partially related mechanisms by which life course interdependencies are brought about. Developmental path dependencies might be adaptive: forcefully propelled forward by general expectancies like dispositional optimism and selective optimization of goals. Or they might be maladaptive, driven by secondary control of adjustment to external forces. Institutionalized path dependency is structured by opportunities or their lack, cumulative advantage and disadvantage and the long shadows of parents and even grandparents. These shadows might also compensate for initial failures.

The Buchmann and Heckhausen paper constitutes true progress both in regard to theory building and in regard to the integration of life span psychology and life course sociology. But I have a few critical reflections. On the one hand, they are portraying an actor with clear life designs who is at most captive to his own prior goal selection and decisions. On the other hand, they envision many institutional constraints of a mostly normative character. This raises the issue to which extent

contemporary persons are still "inner-directed personalities" or are, rather, flexible selves constantly adapting to outside pressures and fashions (Meyer, 1986). Also their theory horizon tends to underplay the extent to which persons are not selecting, but are being selected and allocated into tracks.

Although the striking analogy of Waddington's epigenetic landscape suggests the early divergence of pathways, there is both the issue of which mechanism bring this about and how strong divergences are Heckman (2006) work on early intervention and on the role of non-cognitive dispositions might have been an important reference in this context. Moreover, the resilience of persons with bad starting conditions and the "skidding" of children with excellent starting conditions raise the issue of the reversibility of trodden paths (Schoon, 2006), as well as the underlying mechanisms for surprising reversals of downward careers, as in the case of Sampson's and Laub`s (1993, 2003) hard core criminals. As Harkönen and others have shown under some societal conditions (Sweden!) adverse events, such as unemployment, divorce or mother leave employment interruptions do not leave long term "scars" (Härkönen, Manzoni, & Bihagen, 2016). I would further question whether the predominant picture of social structure as predominantly age-graded normative is sufficient (Mayer, 2003), social inequalities are also positional stratification orders resulting in unequal distributions of resources and hierarchies of power.

What I am missing in the contributions by both Bernardi et al. and by Buchmann and Heckhausen is the recognition that the distinction between the individual and the supra-individual is not just one of "levels," but implies processes of the aggregation of individual life outcomes and the repercussion of such aggregation of life decisions and trajectories. That is to say individual life events are actually producing one type of supra-individual level. A well -known case is how individual marriage chances are affected by age-graded marriage pools. Likewise the role of the number of siblings and cohort size are long established theoretical tenets which are worthwhile to be more systematically incorporated. As Willekens, Bijak, Klabunde, and Prskawetz (2017) state: "… a mechanism-based theory of population change rests on two pillars: a theory of action and a theory of social diffusion."

This brings us back to the open issue whether the life course cube could be advanced beyond merely a "theoretical foundation", and be transformed on the one hand into a number of more explicit theories and on the other hand into an accounting scheme like the age, period and cohort model in demography with invariances and numerical parameters.

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