



Transitionen von der Erstausbildung ins Erwerbsleben  
Transitions de l'Ecole à l'Emploi  
Transitions from Education to Employment



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BERN

# THE TREE MULTI-COHORT PANEL STUDY: THEORETICAL FRAMEWORK

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## I Introduction

TREE (Transitions from Education to Employment) was conceived as a multi-disciplinary panel study that investigates educational and employment pathways of two Swiss school leavers. The two cohorts left compulsory school after ninth grade<sup>1</sup> in 2000 and 2016, respectively. The study's main objective is to generate high-quality panel data for research on school-to-work transitions and, from a long-term perspective, on life courses up to middle age.

This objective involves the challenge of setting up a survey programme that is coherent not only from a theoretical perspective, but also — and no less importantly — to respondents when they complete the questionnaires. A further challenge lies in the longitudinal nature of TREE: Both «objectifiable» factors influencing educational and occupational pathways and subjective characteristics such as perceptions, attitudes, motivations and identities change over time. This requires theoretical references that do the best possible justice to the particularities of specific biographical phases. Furthermore, the two cohorts encounter differing demographic, familial, educational, institutional, technological, and economic conditions. A comprehensive theoretical framework therefore also has to account for contextual changes at the macro level.

At the inception of the study, we thus sought to lay the groundwork for an open theoretical framework that both connects with the research field's various disciplines and allows for comparative analyses across cohorts. Furthermore, the initial framework had to be open for further development and adjustment of the survey programme — be it due to biographical and life-cycle developments, social changes between cohorts, or methodological or theoretical innovations in the respective fields of research.<sup>2</sup>

In Section 2, we briefly present the general context in which educational and employment pathways of adolescents and young adults unfold, by outlining the most salient features of the Swiss education system and labour market. Section 3 develops TREE's theoretical framework both at a general level and with regard to its multi-disciplinary implementation in the design of the study's survey instruments. Section 4 elaborates on how both the theoretical framework and its operationalisation in terms of the development of our survey instruments have evolved between cohorts.

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<sup>1</sup> Eleventh grade according to a recent adjustment of counting school years in Switzerland that also takes two years of kindergarten into account.

<sup>2</sup> It should be noted that the theoretical foundations of life course research have greatly evolved over the past two decades (Bernardi, Huinink, & Settersten, 2019; Blossfeld & von Maurice, 2011; Diewald & Mayer, 2009). The need for adaptability pertains to adjustments both within (i.e., extensions of the survey programme in later panel waves) and between cohorts (i.e., finding the proper balance between replication of the survey administered to the first cohort and innovations implemented in the second cohort only).

## 2 Switzerland's education system and labour market

This section outlines the most salient characteristics of the Swiss education system and labour market, with a particular focus on the main objectives of compulsory education, the end of which marks the beginning of TREE's longitudinal observation of adolescents.

### 2.1 Education system

A large number of actors are involved in the organisation, governance and funding of the Swiss education system. Its federal structure is a defining feature, and at least at the compulsory levels<sup>3</sup>, political decision-making authority is distributed between the three political levels of the federal state, the cantons and the municipalities. The distribution of public expenditure for education between these three political levels reflects this federal structure accordingly. Nearly two-thirds of public expenditure for education falls on the cantons, a good 25 per cent on the municipalities and only about 10 per cent on the federal government.<sup>4</sup>

The main educational-policy actors are the cantons. With respect to compulsory education (until the end of lower-secondary education), their extensive jurisdiction is constrained by only a few constitutional provisions at the federal level. «Operational» responsibility for the implementation of compulsory schooling lies subsidiarily with the municipalities.

Since 1970, compulsory schooling has been coordinated between the cantons via *concordats*, which are negotiated between them within the framework of the Swiss Conference of Cantonal Ministers of Education (*EDK*<sup>5</sup>). These concordats are treaties that require ratification by the cantons. The most recent one, the *HarmoS Concordat* of 2007 (EDK, 2011), responded to the 2006 amendment of the constitutional provision that requires the cantons' educational institutions to define uniform national standards for the regulation of important parameters<sup>6</sup> in the education sector. The HarmoS Concordat provides the foundation on which «national education targets» or «educational standards» are developed. These standards determine the basic skills that students are supposed to have acquired in certain core subjects at certain points in their educational careers (cf. section 2.3 for more details).

The majority of these cantonal school systems feature a pronounced system of stratification beginning with *lower-secondary school* (*ISCED2*). Most cantons track students, starting at an average student age of about 12, into two to four different types of lower-secondary programmes with varying levels of academic requirements. About 30 per cent of learners are channelled into

<sup>3</sup> Primary and lower-secondary levels.

<sup>4</sup> See the educational indicators provided by the Swiss Federal Statistical Office ([www.bfs.admin.ch](http://www.bfs.admin.ch)).

<sup>5</sup> Schweizerische Konferenz der kantonalen Erziehungsdirektoren.

<sup>6</sup> In addition to organisational aspects such as age of school entry or length of compulsory education, this involves the harmonisation of a range of other parameters pertaining to organisational matters at the school level and curricula such as achievement or proficiency targets for the various levels of compulsory schooling.

the educational programmes with «basic academic requirements».<sup>7</sup> The share of students in these programmes varies by canton between around ten to over 40 per cent.<sup>8</sup> For years, education policy has sought to enhance permeability between lower-secondary tracks (WBF & EDK, 2015). These efforts notwithstanding, initial tracking remains largely irreversible. Although the available data is patchy, we can assume the rate of transition between tracks, both upward and downward, to be between 5 and 15 per cent (Kanton Zürich, 2016; Neuenschwander, Rottermann, Rösselet, & Niederbacher, 2015).

In theory, tracking is supposed to be based on academic achievement. In practice, however, tracking occurs on the basis of extremely vague and unreliable criteria and is socially highly selective, even when we control for achievement (Bauer & Riphahn, 2006; Felouzis, Charmillot, & Fouquet-Chauprade, 2011; Gomensoro & Meyer, 2021; Neuenschwander, Gerber, Frank, & Bosshard, 2013). Track-specific distribution curves of standardised skills scores measured at the end of compulsory school invariably show a substantial overlap (Gomensoro & Meyer, 2021; Ramseier et al., 2002). According to Gomensoro and Meyer (2021: p. 19f.), standardised math scores overlap even between the lowest and the highest track (basic vs. high requirements), which indicates that they may be achieved by an important share of students of any of (three) observed tracks. Previous research drawing on PISA-based reading and maths literacy scores show almost identical distribution patterns (Ramseier et al., 2002).

The findings strongly question the claim that track assignment is mainly performance-based, thus substantially compromising the discriminatory power of tracking at lower-secondary level (see also Kronig, 2007). This is all the more the case as we have to keep in mind that the scores were measured at the end of said level, that is, three years after the beginning of tracking. We may assume that the overlap would be far greater if we take the curricula of the various tracks into account, which strongly differ in terms of extent and level of academic requirements and are known to lead to substantial scissor effects even when controlling for individual student achievement (see e.g., Angelone, 2019; Angelone, Keller, & Moser, 2013).

In Switzerland, compulsory schooling ends with the completion of lower-secondary education at average age 15 to 16. The most recent amendment, the *Intercantonal Agreement for the Harmonisation of Compulsory Education*,<sup>9</sup> redefined the objectives to be achieved at this level of education. They pertain to the basic skills that a student are expected to master by the end of compulsory education and comprise educational objectives geared to basically enable the student to lead an autonomous life.

Compulsory schooling is followed by upper-secondary education, which intends to qualify students either for the pursuit of an occupation or for education and training at tertiary level. In the governance of post-compulsory education, the federal government plays a more

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<sup>7</sup> I.e., the programme with the lowest academic requirements in a canton's track system (except special needs programmes).

<sup>8</sup> See the educational indicators provided by the Swiss Federal Statistical Office ([www.bfs.admin.ch](http://www.bfs.admin.ch)).

<sup>9</sup> Interkantonale Vereinbarung über die Harmonisierung der obligatorischen Schule (HarmoS Concordat) of 14 June 2007 (EDK, 2011).

significant role. In principle, the higher the level of education, the greater the federal role in governance, regulation and funding. Yet, even in those areas in which the federal government assumes a greater role, its involvement usually follows the principle of subsidiarity. Vocational training is essentially subject to corporatist governance. In addition to the federal government and the cantons, the corporatist arrangement involves what is referred to as *Organisationen der Arbeitswelt* (Oda; organisations of the world of work), that is, professional and industrial associations as well as the social partners (employer and labour representatives).

Youths who fail to make a direct transition to upper-secondary education usually enrol in so-called interim programmes,<sup>10</sup> which are designed to support students in overcoming educational deficits or a lack of maturity in their ability to make career choices. Upper-secondary education includes general education programmes (*Gymnasien*),<sup>11</sup> where graduates can obtain an (academic) baccalaureate certificate, upper-secondary specialised schools (*Diplom- and Fachmittelschulen*) and above all basic vocational education and training<sup>12</sup> (VET) (SWIR, 2014; Wettstein, Schmid, & Gonon, 2014), in which 65 to 70 per cent of all school leavers in Switzerland enrol. The majority of VET learners are enrolled in «dual» programmes, in which the training companies select and mentor their apprentices.

Graduation from basic VET opens a path to a vocational baccalaureate, which enables access to the universities of applied sciences. In addition, there exist a variety of options for higher vocational training, which are either paid out of the trainees' pockets or by employers (SCCRE, 2018; SERI, 2022). Despite the stated objective of educational policy to increase vertical mobility in the system of vocational education, the share of individuals with basic VET who obtain a tertiary-level certificate has been stagnating at about one-third (Meyer, 2016).

## 2.2 Labour market

Since the new millennium, the Swiss labour market has enjoyed a thriving economic climate with high labour demand across all skill levels, especially for workers with tertiary education, and very high wage levels by international standards. The employment rate is high and unemployment low across the board.<sup>13</sup>

<sup>10</sup> The usual path in Germany to continue general education in order to achieve a higher-ranking certificate of lower-secondary education is not an option in Switzerland, since no school-leaving certificate is conferred at this level (Hupka-Brunner, Gaupp, Geier, Lex, & Stalder, 2011).<sup>11</sup> This is equivalent to the German *Abitur*. General education programmes of the *Gymnasium* type are classified at (second order) ISCED level 34. The same is true for programmes of *Diplom-* and *Fachmittelschulen*. For details see (BFS, 2015).

<sup>11</sup> This is equivalent to the German *Abitur*. General education programmes of the *Gymnasium* type are classified at (second order) ISCED level 34. The same is true for programmes of *Diplom-* and *Fachmittelschulen*. For details see (BFS, 2015).

<sup>12</sup> Basic VET extends over two to four years. Students can enrol in some 200 occupations and complete their education by obtaining a federal VET diploma or certificate. Dual VET usually comprises work and training in a training company alongside 1–3 days per week of vocational school. (Basic) VET at upper secondary level is classified at (second order) ISCED level 35 (BFS, 2015).<sup>13</sup> This also holds for the (first) two years of the COVID-19 pandemic. For details, see Swiss labour force survey results: <https://www.bfs.admin.ch/bfs/en/home/statistics/work-income/surveys/slfs/pub-findings.html>.

<sup>13</sup> This also holds for the (first) two years of the COVID-19 pandemic. For details, see Swiss labour force survey results: <https://www.bfs.admin.ch/bfs/en/home/statistics/work-income/surveys/slfs/pub-findings.html>.

In the Swiss labour market, which is regarded as being liberal and rather weakly regulated, over 75 per cent of the workforce is employed in the service sector. The high demand for skilled labour is met to a substantial degree via immigration of highly qualified workers<sup>14</sup> from neighbouring countries (Observatorium FZA, 2018; Schellenbauer, Walser, Lepori, Hotz-Hart, & Gonon, 2010; SECO, SEM, BFS, & BSV, 2015).<sup>15</sup> Moreover, the Swiss labour market is characterised by a high level of skill-based segmentation. Apart from a fairly small (low- to unqualified) segment of the labour market that is open to everyone, there are numerous segments to which access is regulated by requiring specific vocational education and training (Sacchi, Kriesi, & Buchmann, 2016).

### 2.3 Curricular objectives to be met at the end of compulsory school

Longitudinal observation of the TREE cohorts starts at the end of compulsory school. At this point, students are expected to have met certain educational objectives that extend, beyond the acquisition of skills and choice of occupation, to other life domains. Other major objectives of schooling pertain to the development of self- and social competences, which are supposed to empower youths to lead an autonomous life (EDK, 2011; WBF & EDK, 2015). This lends school a special status since it is expected to contribute to integrating the young generation into society — while it is first and foremost also the institution tasked with assessing the skills that it itself is supposed to convey (Fend, 1981; Kronig, 2007; Solga, 2005; Titze, 2000). Thus, school becomes a «distributor of life chances» (Fend, 1981; Schelsky, 1957), as it signals to the institutions of further education and training (by means of grades, certificates etc.) a student's academic achievements and the skills acquired. From an analytical point of view, it is therefore particularly interesting to distinguish between various facets of skills and achievement (e.g., grades, lower secondary track attended, standardised assessments of literacy or general cognitive skills). Each of these facets determines youths' further educational pathways in its own, distinct way – with its own, distinct consequences in terms of (educational/career) success. (Coradi Vellacott, Hollenweger, Nicolet, & Wolter, 2003; Moser, 2004; OECD, 2018; Tomasik, Oostlander, & Moser, 2018; Zumbühl & Wolter, 2017).

If we adopt such a broad understanding of education, we can judge whether compulsory schooling was «successful» only in the mid to long term on the basis of criteria that correspond to its educational objectives. Starting from this vantage point not only directs our attention to the next steps in a student's educational career or later position in the labour market. It also tells us how well the individual comes to terms with other tasks of personal development such as leaving the parental home or establishing a partnership, along with other criteria for assessing the «success» of schooling such as the development of self- and social competence, a person's later health behaviour and well-being, and social and political participation. Accordingly,

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<sup>14</sup> That is, workers who graduated from tertiary-level education.

<sup>15</sup> Whereas up to the early 2000s, labour migration to Switzerland was predominantly low-qualified, there has been a substantial shift towards high-qualified migration since Switzerland's agreement with the European Union on the free movement of labour came into effect in 2002 (Observatorium FZA, 2018; SECO et al., 2015).



TREE has designed a broad survey programme that is able to capture and assess, in a longitudinal perspective, relevant aspects of individual psycho-social development and social inclusion.

One of the most consequential junctures that youths face is the transition to post-compulsory education after the end of compulsory schooling. It is at this point that youths and their families must master challenges and mobilise resources to find the best possible solution for taking the next step.

### 3 TREE's theoretical framework and its operationalisation

#### 3.1 Life course theory and the life course cube

TREE draws on life course research as its general theoretical framework. The life course paradigm has become an established strand of research in a number of disciplines (e.g., sociology, psychology, educational science, economics, health studies, history, political science, criminology; see Bernardi et al., 2019). It makes reference to both sociological (Elder, 1975) and psychological issues (Baltes, 1990) that are equally significant in matters of educational transitions. Theoretical traditions in both sociology and psychology consider the embeddedness of individual processes of development in historical and local contexts to be of crucial importance. This commonality notwithstanding, life course sociology views individual life courses as being strongly affected by opportunity structures and institutional frameworks, in the context of which individuals must act according to the resources available to them and the pressures they face. Lifespan psychology on its part devotes greater attention to intrapersonal development and how the individual adapts to external conditions (Bernardi et al., 2019; Diewald & Mayer, 2009). According to Diewald and Mayer (2009), both theoretical traditions assume that individual action is guided by bounded rationality<sup>16</sup> and that individual age or biographical time is an important factor in one's life course and individual decision-making.

Moreover, there is widespread agreement that an individual's life course and development is embedded in social contexts (significant others, institutions) and that transitions are developmental tasks that can be conceived of as challenges in the face of which the individual must make decisions. Understanding individual action also calls for analysing the various areas of life that youths and their families must deal with (Bernardi et al., 2019).

For a multi-cohort panel study such as TREE, the temporal dimension is particularly significant, as it can influence individual development in various ways (Brüderl, 2010). On the

<sup>16</sup> Simon (1959) was one of the first scholars to question the prevailing conception in economics that individuals act rationally on the basis of their self-interest. He emphasised that theories positing strictly rational human behaviour often fail to provide particularly good explanations and that understanding human behaviour also requires taking individual goals and the individual ability to adapt into consideration. In 2002, Daniel Kahnemann received the Nobel Prize in economics for his research on «bounded rationality», which employed two psychological principles («the perceptual primacy of changes over state» and «the representation of categories and sets [averages] in perception and memory») to illustrate that human behaviour is often intuitive, that is to say, it involves quick and effortless judgement. The more complex the underlying problem, the more this seems to be the case (see, e.g., <https://www.nobelprize.org/prizes/economic-sciences/2002/kahneman/lecture/>).

one hand, developments can be driven primarily by age (e.g., because of individual maturation or of certain social expectations, roles or age-dependent rights such as the right to vote), which has been called the *age* or *life-cycle effect*. On the other hand, individual developments can also be triggered by events (e.g., the COVID-19 pandemic<sup>17</sup>), social changes<sup>18</sup> or technological innovation (e.g., digitisation) that change the relevant contexts. To the extent that such events entail changes in all age groups at the same time, this is called a *period effect* (e.g., when an economic slump leads to increasing unemployment). By contrast, if such an event has a specific impact on the behaviour or development of a specific generation, this is referred to as a *cohort effect*. In empirical studies, it is usually not possible to unequivocally distinguish age, period and cohort effects (Brüderl, 2010). Conceptually, however, it is crucial to take the three forms of dependence on time into account properly, particularly for comparative studies of cohorts.<sup>19</sup> Between the first and second cohort we can see a number of societal changes in the contexts relevant to development, which leads us to expect significant cohort effects. Among them specifically are changes in the composition of migrant populations to Switzerland and in the forms of family life, an enormous expansion and change in the use of media services as well as a variety of substantial reforms of the education system (Autorengruppe Bildungsberichterstattung, 2018).

A more recent theoretical development that has guided our work is the approach by Bernardi et al. (2019). This approach starts from the observation that various new developments in life course research agree on key points (the significance of time,<sup>20</sup> domains<sup>21</sup> and different levels<sup>22</sup> at which processes occur) but that so far we lack a unifying theoretical framework. To remedy this, Bernardi et al. propose what they have called the «life course cube» (see Figure 1) to integrate

<sup>17</sup> Considerations concerning the consequences of the Corona virus on the life course can also be found in Settersten et al. (2020).

<sup>18</sup> For example, the agreement on the free movement of persons between Switzerland and the EU [2002], the 2004 amendment of the Swiss Vocational and Professional Education and Training Act or the introduction of shared child custody in 2014 with all its legal implications for families. For more details, see also section 4.1.

<sup>19</sup> The concept of cumulative disadvantage (CDA) (Burton-Jeangros & Widmer, 2009; Dannefer, 2009; DiPrete & Eirich, 2006; Shanahan, Mortimer, & Johnson, 2016; Vandecasteele, 2011) looks at differences in the development of cohorts (or similar groups). Scholars applying this concept have found that differences in a cohort's opportunity structures in various life domains increase over time. CDA is a general process that appears as a regular feature of cohort ageing. An impressively consistent pattern of increasing intra-cohort inequality with regard to income as well as health outcomes based on education or other indicators of social class can be observed (at least for 20th-century U.S.A.).

<sup>20</sup> In life course research, time is significant in various respects. For one, life course research is interested in distinctions between period/cohort and age effects. For another, expectations of the future shape individual behaviour just as much as previous experience. Moreover, life course analyses enquire into path dependencies or cumulative disadvantages.

<sup>21</sup> What we call *domains* are different areas of life such as family, education, employment, leisure, politics and so forth.

<sup>22</sup> The authors (ibid.) identify three levels: 1) The intra-individual level comprises *an individual's biological, physiological and psychological conditions or resources* such as dispositions, values, attitudes or well-being. In a longitudinal perspective, these can also be perceived as outcomes. 2) The individual level pertains to biographical states that can be attributed to the *outcomes of individual actions* over the course of his or her life, such as academic achievement, social status or individual resources that can be utilised, for instance, to gain certain privileges. 3) The supra-individual level refers to the attributes of the «external» *societal opportunity structure* for individual experiences, behaviours and actions. Here, we can identify a host of sublevels (ranging from individual organisations to larger social institutions or legal, cultural and economic frames and collective actors).

various (disciplinary) approaches in the field and thus create a common theoretical foundation. The authors define the life course as

*«a multifaceted process of individual behavior, that is, it evolves from the steady flow of individuals actions and experiences, which modify their [the individuals] biographical states. We define the biographical state of an individual I at age x and time t— $bsi(x)$ —as a vector of (ideally) all attributes that are part of or given to an individual, describing the individual's states in various life domains at age x.»* (Bernardi et al., 2019, p. 2)

With their life course cube, Bernardi et al. provide a useful conceptual scheme that has made a major contribution to creating a uniform terminology and structuring the theoretical debate. A key premise of this theoretical conception is that individuals seek to maintain or enhance their subjective well-being (ibid., p. 2). It sees individual development as a lifelong process that is strongly defined by the individuals adapting to new or changing situations. Individuals are conceived of as actors whose actions are socially embedded and thus understood as «agency with structure» or as «bounded agency».

Against this background we believe that, on the one hand, it is necessary to consider that many ends (and means) of action are genuinely collective or social by their very nature (e.g., the wellbeing of a family) (Crockett, 2002; Dannefer, Kelley-Moore, & Huang, 2016; Marshall, 2000). On the other hand, social embeddedness is not sufficiently understood in terms of individuals engaging with purely external, exogenous structures that themselves remain unaffected by individual action. Rather, social structures emerge and are reproduced first and foremost through the interactions of individuals (which in turn affect individual action).

We view the life course cube as a useful heuristic, which we will rely on to organise theoretical references and concepts, but we also want to emphasise the importance of employing an *open* concept of agency. To model the multiple embeddedness of life courses, we consider various analytical dimensions: levels (intra-individual<sup>23</sup>, individual or supra-individual), time (developmental programmes, life courses, social change) and domains of life (e.g., work, family, health).

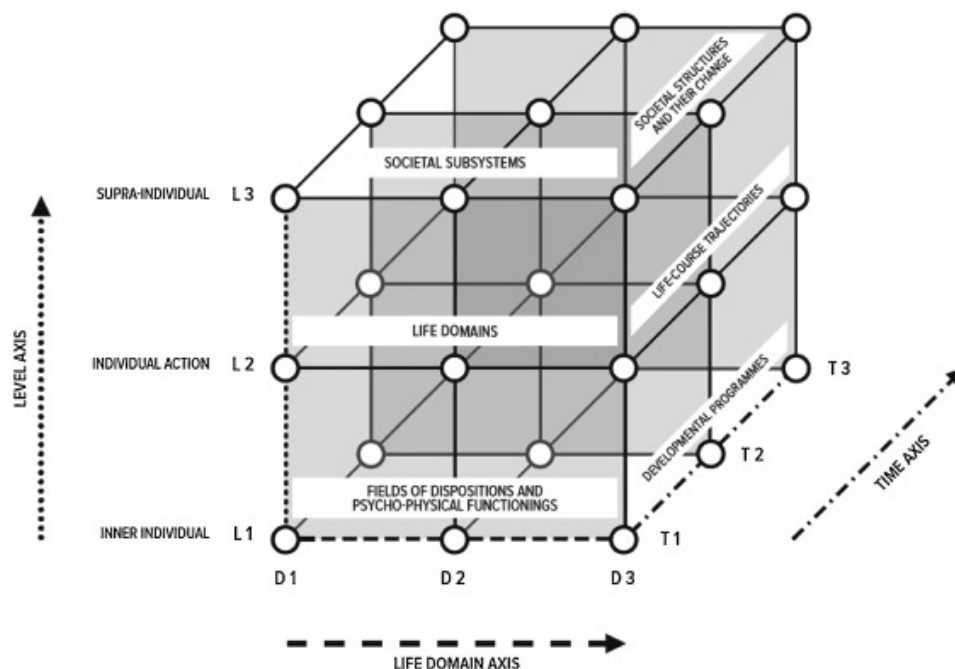
Moreover, the different axes are interwoven both internally and with one another, with life courses being primarily characterised by three kinds of interdependencies:

- a) Temporal interdependency: An individual's previous life history (cumulative experiences and resources as represented in the person's biographical status quo ante) as well as the current circumstances of that person's life shape future events. Typical examples of this in existing research are the conceptions of «path dependency», «accumulation of dis-/advantages», «risk chain models» or «turning points».

<sup>23</sup> Referred to as «inner individual» in Figure 1.

- b) Interdependency of life domains: Actors can acquire resources in different domains of life and in some cases draw on resources from one domain to compensate for a lack of resources in another. The arrangements that families make to reconcile family and employment are a good example of the interconnectedness of domains.
- c) Interdependency of processes: This refers to mechanisms by which social structures and psychological processes, mediated through individual action, mutually affect one another. Research in this area focusses, for instance, on the significance of the social composition of relevant groups or of new legal norms for individual trajectories (e.g., the composition of the school population and the trajectory of children's learning; the Schengen Treaty and the changed migration experiences in Switzerland).

Figure 1: Life course cube (Bernardi et al., 2019, p. 4)



From this, we can derive additional levels of interdependency, for instance, when temporal interdependencies interact with connections between different levels (e.g., when institutional norms influence the individual timing of educational pathways).

As mentioned at the outset of this paper, the theoretical foundations outlined here are not intended to replace specific theoretical approaches to life course issues but rather to provide an integrative framework for various perspectives. We assume that there are typical interdependencies that are strongly influenced by societal structures and arrangements, such as those that result when reconciling work and family. Yet, we also have kinds of interconnectedness in mind that are rather situated at the individual level between different life domains, for instance, when health issues or accidents affect an individual's educational pathway (e.g., termination of a VET contract).

### 3.2 The TREE survey programme through the lens of the life course cube

Similar to Bernardi et al.'s (2019) life course cube, TREE attempted early on to track individual life courses along various dimensions while considering various points in time, domains and levels (see Figure 1).

As TREE's objective is to describe and analyse transitions within and between the education and the labour market systems, its survey instruments focus on the level of 'individual action'. In addition to a detailed survey of educational and employment pathways, TREE therefore also enquires into life domains beyond the curricular-cognitive dimension such as family, significant others, health and well-being. We do so because, on the one hand, some objectives of compulsory school (e.g., health or social integration) pertain to these life domains. On the other hand, these life domains can be expected to have a strong influence on (further) educational and occupational pathways.

Moreover, TREE's survey programme also devotes particular attention to the intra-individual level. This level, too, involves many factors that influence both educational pathways and personal development. Indeed, the latter can be understood as an important educational objective in its own right. Alongside the (cognitive) skills that the respondents have acquired, the TREE survey programme spans various non-cognitive factors (e.g., motivation, self-perception, the regulation of action, global preferences and values). In TREE, the supra-individual level of Bernardi et al.'s (2019) life course cube corresponds with the various federal levels of the education system and the labour market, but also with general social norms and regulations as well as the institutional setting, which may vary by region.

Figure 2 gives an overview (in line with Bernardi et al.'s [2019] life course cube) of the various levels and domains that TREE's survey programme takes into account. The top light-green area titled «supra-individual level» marks the most important societal trends and events that have affected our cohorts' pathways. The segment 'level of individual action' shows the different life domains that the TREE survey has taken into consideration. The keywords refer to the most important issues and concepts in the respective domain. Our observation of the TREE cohorts begins with the end of compulsory education, which was the 1999–2000 school year for the first cohort and 2015–16 for the second. This marks the point of transition to upper-secondary education, which is later followed by the transition to tertiary or further education or to the labour market (shown in the life domain of 'educational and employment activities'). In the domain of 'family, significant others, networks', we highlight two developments that are significant for a large majority of individuals: Detaching oneself from one's family of origin (which involves moving out of the parental home) and, as the case may be, starting a family of one's own at a later time, which involves the effort to reconcile work and family.

In contrast to the two aforementioned life domains, for which certain social age norms exist, it is much less clear when development in the domain of 'socio-cultural participation' becomes particularly relevant. The basic objective is to achieve good integration in the domains of

everyday life and leisure regardless of age. With regard to political integration, we can assume that it gains greater significance, at least theoretically, as the individual comes of voting age.

In the domain of ‘health and well-being’, the focus is on satisfaction with life in various domains and one’s general health. This domain is significant because the knowledge and practice of a healthy way of life is an important educational objective. At the same time, pronounced interdependencies with other domains are conceivable, for instance, when youths’ exploratory behaviour with regard to substance consumption inhibits performance in education or at work. We also consider critical life events, which can occur in different contexts and influence individuals’ well-being or health (and thus their educational and career pathways).

At the intra-individual level, the ‘self’ domain comprises factors such as motivation, regulation of action and personality characteristics as well as various non-cognitive skills. With regard to these factors too, we assume that they may both influence educational and career pathways and be an important outcome of education.

The key idea guiding TREE’s survey instruments was to design the survey programme such that it would cover theories of various disciplines and — where possible — employ concepts and measures that are tried and tested and tie in with international research. As response burden (both per survey wave and across the entire panel) is known to increase panel attrition, TREE uses, where possible, short scales and favours survey instruments that are useful for various theories and research questions («polyvalent constructs»)<sup>24</sup> The overview in Table 1 gives an idea of the theoretical approaches and research questions that can be pursued using TREE data (see also Hupka-Brunner et al., 2021). On the one hand, the TREE survey programme draws on theories that either refer to single life domains or typical interdependencies between them. On the other hand, it captures the intra-individual processes at work in the transitions under scrutiny.

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<sup>24</sup> For an overview of the scales used in TREE1, see (TREE, 2016). For those used in TREE2, see the overview by (Hupka-Brunner et al., 2021) and the detailed documentation in (Sacchi & Krebs-Oesch, 2021).

Figure 2: TREE study and survey instrument design by levels and life domains according to Bernardi et al. 2019 (life course cube)

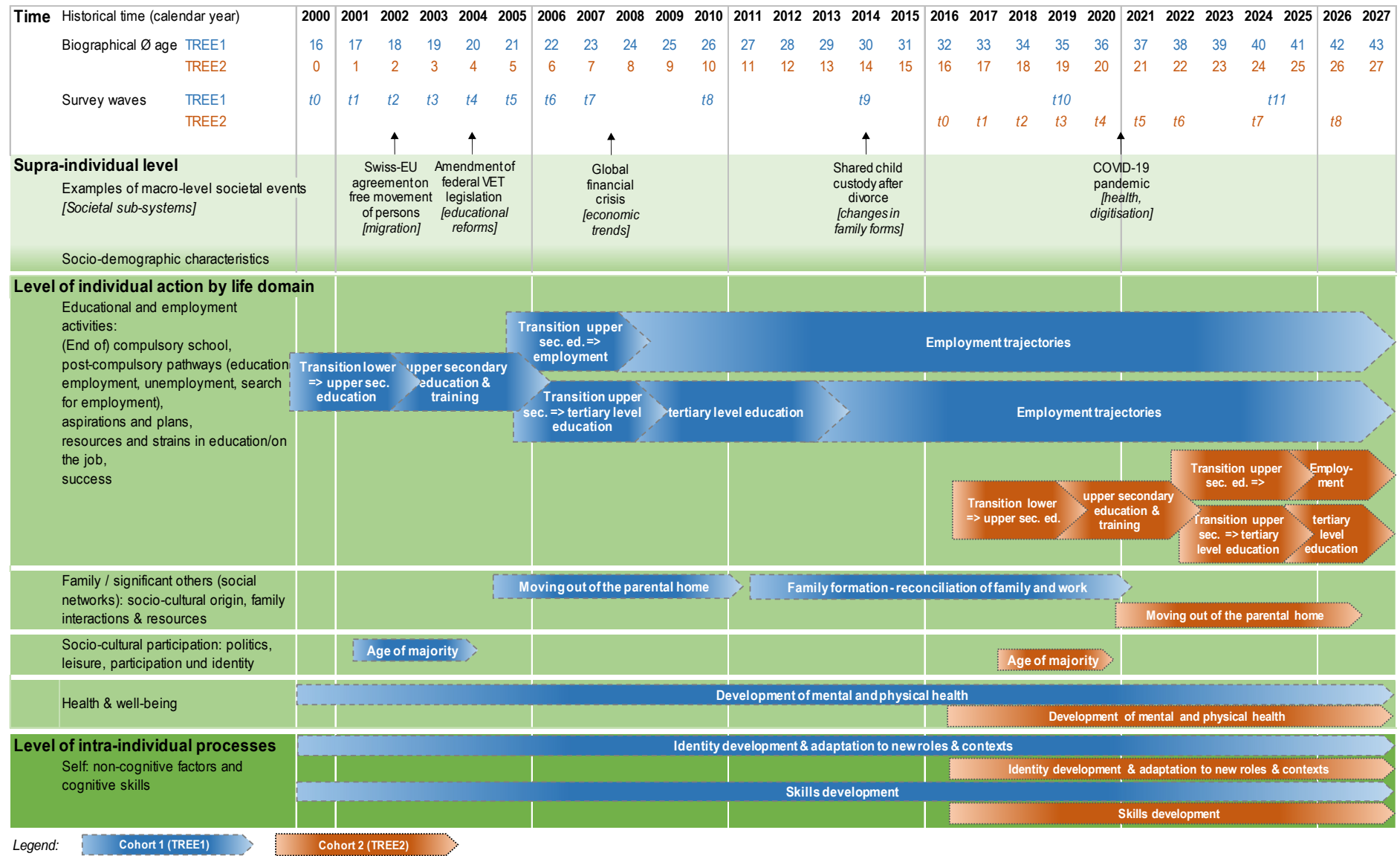


Table 1: Conceptual foci of the TREE(2) survey programme

Survey topics		Comparability with TREE1		
		(partly) comparable	extended or refined	improved time references
Main	Detailed			
Socio demographics	Socio-demographic characteristics and housing situation			
	Age and Gender	C		
	Civil Status	(C)		⊕
	Housing situation	C	*	
	Composition of (own) family	(C)		⊕
	Migration background and nationality			
	Migration background	C	*	
Nationality, residence status		**	⊕	
Education, training and employment	Educational pathways and transitions (lower sec. level)			
	Educational biography (compulsory school)	C	(*)	
	Educational decisions (transitions lower => upper sec. education): perceived cost, benefit and chances of success		**	
	Educational objectives and aspirations	C	**	
	Plans for education and training	C	*	
	Characteristics of maths lessons (end of lower secondary education)		+	
	Educational situation and post-compulsory pathways			
	Attended educational programmes	C		⊕
	Attended schools	C		⊕
	Attended training firms	C		⊕
	Skills requirements for educational activities / media use		(x) / *	
	Absenteeism / intention to change education	C		
	Resources and strains (education)	C	*	
	Credentials and marks	C	**	⊕
	Reasons discontinuing education and training		**	⊕
	Employment situation (incl. internships) and pathways			
	Employment / internships	C		⊕
	Conditions of employment	C	*	
	Job position within company's hierarchy	C		
	Salary	(C)	*	
	Resources and strains (employment)	C	*	
	Job tasks, requirements and job-skills-mismatch	(C)	**	
	Absenteeism / intention to change job	C		
Reasons for termination of employment		*	⊕	
Self-assessment of education and employment pathways				
Assessment of current education and training		**		
Perceived fit and commitment: main activity (?)	C	*		
Other activities, job and training search	Search for education or employment			
	Search for education (end of lower secondary education)		*	
	Search for VET training place (upper sec.)	C	**	⊕
	Job search (upper sec.)	(C)	**	⊕
	Search for general education programme (upper sec.)		**	⊕
	Other activities			
	Unemployment (unregistered and registered)	(C)	*	⊕
Vacation / holidays	(C)		⊕	



Survey topics		Comparability with TREE1		
		(partly) comparable	extended or refined	improved time references
Main	Detailed			
	Military service	( C )		⌚
	Childcare (as main activity)	( C )		⌚
	Illness / accident	( C )		⌚
	Maternity / paternity leave	( C )		⌚
	Gap / missing information	( C )		⌚
	Reasons for non-participation in education and employment			
	Reasons for non-participation in education and employment		*	
	Reasons for non-participation in education		*	
Family, significant others, social origin and networks	Family background			
	Family climate	C	*	
	Socio-economic origin	C	*	
	Social, cultural, and economic resources			
	Social capital (own)		*	
	Cultural capital (family of origin)	C	*	
	Cultural capital (own)	C	*	
	Economic capital (family of origin)	C	*	
	Financial situation (general)	( C )	*	
Social participation	Social and cultural participation			
	Politics	( C )	[**]	
	Leisure		**	
	Group affiliation and sense of belonging (identity)	( C )	*	
Well-being and health	Satisfaction and well-being			
	Satisfaction	C	*	
	School-related well-being		*	
	Critical life events	C	*	
Health	C	[**]	⌚	
Self	Non-cognitive factors			
	Motivational concepts	C	*	
	Self-perception	C	*	
	Emotions related to maths classes		+	
	Volitional strategies	C	*	
	Personality characteristics		*	
	Global preferences (risk, time and social preferences)		*	
	Values and attitudes	C		
	Attitudes related to maths classes		+	
	Cognitive skills (assessments)			
	basic mathematical skills	( C+ )	**	
reading speed		(**)		
cognitive skills		(**)		

Legend for columns on comparison with TREE1:

C = Data (partly) comparable across cohorts. ( C ) Comparable data for both cohorts in upcoming data releases. ( C+ ) Elaborated, but not fully comparable assessment of math competences available for both cohorts (TREE1: randomized split-half sample).

\* Survey programme slightly extended compared to TREE1. \*\* Survey programme strongly extended compared to TREE1. + extended survey programme (AES topic). (\*) = New data on transition primary school to secondary I not in this release. (x) = Skill requirements surveyed in later waves (data not in this release). [\*\*] New survey modules (web only) for randomised split half sample. (\*\*) Assessment data (not in data release 2021).

⌚ Additional or refined data on the timing of activities, transitions or events in TREE2

## 4 The TREE survey programme: Similarities and differences between cohorts

### 4.1 A changing macro context

The survey of the first TREE cohort (TREE<sub>1</sub>) started in 2000 and that of the second (TREE<sub>2</sub>) 16 years later. To facilitate comparisons between the two cohorts, TREE<sub>2</sub> is at least partially designed to replicate TREE<sub>1</sub>. Nevertheless, TREE<sub>2</sub>'s survey programme comprises numerous innovations to account for recent societal developments (cf. also Figure 2). In the 16 years that lie between the launch of the two TREE cohorts, the macro context in which educational pathways and transitions are embedded has witnessed substantial changes, including major reforms of the education system, which are likely to change youths' educational pathways. Global developments in the economy, communication technology, environment, science and demography pose major challenges to education systems worldwide (Blossfeld et al., 2007). The Swiss education system is no exception to the rule, being confronted with challenges such as the advancing economisation and pluralisation of society (change in family forms, changed fertility patterns, increased international and domestic migration) as well as increasing computerisation and virtualisation of everyday life (Akademien der Wissenschaften Schweiz, 2009).

#### (a) Reforms within the education system<sup>25</sup>

Numerous cantons have carried out reforms in lower-secondary education during the period in question. This involved, for instance, the unification of the structures and learning objectives of compulsory schooling defined in the HarmoS Concordat of 2007 (EDK, 2011).<sup>26</sup> What needs to be highlighted from the perspective of the institutional embeddedness of educational pathways in this respect is the unification of the time of transition from primary (eight years duration, including the entry level or kindergarten) to lower-secondary education (three years' duration). In some cantons, this has resulted in a later tracking of students into the various programmes of lower-secondary education.<sup>27</sup> In the literature, this has been associated with a weakening of social selectivity at the point of the transition (see, e.g., Bauer & Riphahn, 2006).

Aside from HarmoS, a number of cantons have enacted or implemented reforms of lower-secondary education since 2000, not least against the backdrop of the political objective, formulated as early as in the mid-1990s, to improve the permeability between the different

<sup>25</sup> Among these reforms are, for example, a major amendment of VET legislation, which was ratified in 2004 ([VPETA](#)), or [HarmoS](#), a scheme geared toward harmonising legislation governing compulsory schooling between the cantons (2007).

<sup>26</sup> This structural unification was mostly also implemented in the cantons that did not officially ratify the HarmoS Concordat.

<sup>27</sup> Prior to the HarmoS Concordat, compulsory schooling (primary and lower-secondary education excluding kindergarten) lasted nine years altogether. In some cantons, the transition from primary to lower-secondary education occurred after the fifth year of primary education, in others after the sixth. Upon the introduction of the HarmoS Concordat, primary education [now] comprises a uniform eight years (including two years of kindergarten or entry-level schooling) and lower-secondary education three years, thus eleven years altogether. An exception is the Ticino canton where the transition to lower-secondary education occurs one year sooner and the latter (*scuola media*) continues to span four years.

tracks of lower-secondary education (Bildungsdirektion Kanton Zürich, 2010; EDK, 1995). Surveys conducted in the cantons by the EDK show that some cantons also introduced or strengthened cooperative and in some cases integrative lower-secondary programmes during the period in question, while others tended to even reinforce their separative models (or let the municipalities choose between different models; see also SCCRE, 2014, p. 88). Yet the differences between the cantonal models today are most likely only gradual (Moser, 2008), as the models labelled as cooperative or integrated also incorporate elements of tracking.<sup>28</sup> Moreover, most of the cantons have restructured the last two years of lower secondary education in response to the scarcity of apprenticeships and in order to better prepare students for the transition to upper-secondary education and their choice of a training occupation (SCCRE, 2014, p. 90). Finally, we should also mention the reforms in special education that have increasingly led to greater inclusion of students with special needs in regular curricula (SCCRE, 2014, p. 46).

The period in question also saw significant reforms in post-compulsory education. One such reform that merits special attention is the amendment of the Vocational and Professional Education and Training Act (VPETA). It entered into force in 2004 at a time when the first TREE cohort had already completed VET (Bundesversammlung, 2004). Since that time, the training regulations have been revised for numerous training occupations (SCCRE, 2014). The reform reduced the number of VET programmes and strengthened inter-company training programmes as a third organisational form of VET.<sup>29</sup> Moreover, significant occupational fields that were once regulated at the cantonal or industry level (particularly in the health sector) are now subject to the 2004 amendment of VET legislation VPETA. Alongside the introduction of specialised schools (*Fachmittelschulen*) and specialised baccalaureates (*Fachmaturitäten*), this has led to an upvaluation and a greater recognition of occupations in the health, social and education sectors as well as in the arts and design, which are mostly chosen by women.

Another major amendment was the introduction of the federal VET diploma,<sup>30</sup> a two-year VET programme designed to grant an upper-secondary degree for low-achieving students. At just under ten per cent of an age cohort, the rate of federal VET diploma graduates today is about three times as high as the rate of the previous (one-year) programmes<sup>31</sup> that have been replaced by the new scheme (SCCRE, 2018, p. 122). The completion rate is at about 75 per cent (Schmid & Kriesi, 2016). Federal VET diploma graduates are entitled to ‘upgrading’ their degree by subsequently completing a full apprenticeship programme leading to a federal VET certificate,<sup>32</sup>

<sup>28</sup> It should be noted that there are more or less accentuated organisational forms of track separation: In some lower-secondary schools students of different tracks are taught in “mixed-track” classes (in all or some subject matters), while other schools teach their students in classes entirely separated by track/programme. The website of the Swiss Conference of Cantonal Ministers of Education (EDK, see [www.edk.ch](http://www.edk.ch)) provides detailed information outlining the organisation of each canton’s lower-secondary-level programmes.

<sup>29</sup> In addition to the «dual» and the school-based form.

<sup>30</sup> *Eidgenössisches Berufsattest (EBA)*.

<sup>31</sup> *Anlehre/formation professionnelle élémentaire*.

<sup>32</sup> *Eidgenössisches Fähigkeitszeugnis (EFZ)*.

usually in the same training profession. Nevertheless, only around a quarter of diploma graduates subsequently enter a 3-4 years apprenticeship (BFS, 2018).<sup>33</sup>

As for their labour-market prospects, most VET diploma graduates are in stable employment after graduation, earn a living wage and are satisfied with their training (BFS, 2018; Hofmann & Häfeli, 2015; Kammermann, 2015). However, Hofmann & Häfeli (2015) point out that holders of a federal VET diploma more frequently experience phases of unemployment and precarious employment than holders of a full apprenticeship certificate (see also BFS, 2018). With regard to the position of the federal VET diploma within the education system's hierarchy, there are different concerns: On the one hand, it has been argued that access to post-compulsory education has become more difficult for low achievers because the new programmes are harder to complete than the previous one-year programmes (Kammermann, 2015). On the other hand, in view of the increasing «tertiarisation» of the education system<sup>34</sup> and the «occupational upgrading» (Kriesi & Leemann, 2020) that it entails, there are concerns of «occupational downgrading» by forcing learners into a two-year programme of this kind who could or would have completed a full apprenticeship under the old system.<sup>35</sup>

### (b) Changes in the labour market and the market for VET training places

The first TREE cohort completed compulsory education in 2000. The situation at the time was marked by a recession during the 1990s and a pronounced lack of VET training places (Hupka-Brunner, Sacchi, & Stalder, 2011). The period was also characterised by a tight coupling between the labour and apprenticeship market, which became somewhat looser from the mid-2000s onward. At the same time, a number of educational policies were adopted (*Lehrstellenbeschluss II*<sup>36</sup>), and the system of transition was systematically expanded and refined. Thus, a comparison between the two periods from 1998–1999 and 2014–2015, which were crucial for the two TREE cohorts in terms of gaining access to VET training places, shows that both the absolute number of VET contracts and the share of training positions that could not be filled increased (see «*Nahtstellenbarometer*»<sup>37</sup>).

<sup>33</sup> In most cases, they are allowed to «skip» the first year of a full apprenticeship.

<sup>34</sup> That is, higher enrolment and completion rates of higher (tertiary-level) education programmes.

<sup>35</sup> Two other elements of reform worth mentioning are the amendment of the vocational baccalaureate directive of 2009 (SCCRE, 2014, p. 126) and the creation of training networks, which was triggered by the funding opportunities introduced by the new Vocational and Professional Education and Training Act in 2004 (see Leemann & Imdorf, 2014). The training networks were intended to create additional VET training places in modern service businesses and occupations, in which the traditional apprenticeship model shaped by industry and the trades has only weak roots (see Leemann & Imdorf, 2014).

<sup>36</sup> Second Agreement on VET policy. See [https://www.fedlex.admin.ch/eli/fga/1999/t\\_5115\\_4734\\_4437/de](https://www.fedlex.admin.ch/eli/fga/1999/t_5115_4734_4437/de).

<sup>37</sup> The «*Nahtstellenbarometer*» is an annual survey, commissioned by the State Secretariat for Education Research and Innovation (SERI), among VET place seekers and training companies with the goal of determining the relation between supply and demand in the apprenticeship market. Since 2018, the name of this survey has been changed from «*Lehrstellenbarometer*» to «*Nahtstellenbarometer*» (*Nahtstelle* ≈ interface or juncture). See <https://www.sbf.admin.ch/sbf/de/home/bildung/berufliche-grundbildung/nahtstellenbarometer.html>.

From a purely quantitative perspective, this indicates a moderate easing in a tight apprenticeship market and an easier transition for the second cohort. However, there are also various indications suggesting that such a perspective may fall short because of increasing qualitative disparities in the labour market (Glauser & Becker, 2016; Schellenbauer et al., 2010). We see evidence of this in the Swiss VET Barometer (*Lehrstellenbarometer*),<sup>38</sup> which shows discrepancies between industries and regions. The share of school leavers who initially enrol in interim programmes (intermediate or preparatory programmes, motivational semester and similar) remains substantial, which suggests persistent allocation problems that are independent of the apprenticeship market (see, e.g., BFS, 2021b; Landert & Eberli, 2015). It is fair to assume (although the available data do not provide indisputable evidence; on this, see Moser, 2004; Schweri & Scharnhorst, 2005) that the disparities between supply and demand can at least partly be traced to increasing requirements on part of the training companies, similar to what can be observed in the labour market for career entrants (Salvisberg & Sacchi, 2014). An indication of this is the high and increasing share of apprenticeship positions that remain vacant, in the face of which training companies lament the lack of sufficiently qualified applicants.

All in all, the second cohort is thus faced with a less tight apprenticeship market than the first, yet for many would-be apprentices the situation has most likely not become much easier. A more plausible assumption is that the successful search for an apprenticeship position still depends substantially on local and/or occupation-specific apprenticeship markets as well as on the apprenticeship seeker's family background, the training profession and the track attended at lower-secondary school.

### **(c) Demographic changes**

The number of school leavers in Switzerland increased by approximately 10% from 2000 to 2010, while decreasing back down to the level of 2000 between 2010 and 2020 (BFS, 2021b). In absolute figures, the school leavers' cohort of 2000, on which TREEr is based, comprised approximately 80,000 individuals; while the respective figure for the cohort of 2016 was at approximately 82,000. However, there is considerable demographic variation across cantons, which can result in regionally greater or lesser demographic pressure at the time of transition from lower to upper secondary education.

### **(d) New patterns of migration**

Another important factor that affects educational and career pathways is migration background. Comparison of the two cohorts suggests that we must reckon with a slight increase in youths with a migration background. That said, the composition of the population with such a background has changed considerably. Whereas migration of low-skilled labour (traditionally from southern and south-eastern Europe as well as Turkey) has been declining, migration of high-skilled workers (mostly from north-western EU countries) has increased substantially

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<sup>38</sup> Cf. footnote 37.

since the agreement on the free movement of persons between Switzerland and the EU (ratified in the early 2000s).

Among the second cohort, we can therefore expect a considerably higher share of youths with migration background from families with above-average socio-economic status (Observatorium FZA, 2018; SCCRE, 2014; SECO et al., 2015). These families typically exhibit high educational aspirations and provide their offspring with above-average financial and learning support. Moreover, and compared with some of the typical countries of origin of the first cohort (e.g., the Balkans and Turkey), these families usually come from countries that are less associated with negative stereotypes in Switzerland. Various pertinent findings suggest that this can be an advantage when applying for an apprenticeship position (Beck, Jäpel, & Becker, 2010; Imdorf, 2010). For this specific group of migrant we can expect rather straightforward educational pathways and above-average educational success (e.g. Griga & Hadjar, 2013; Imdorf, 2010). Apart from this group, however, there are numerous other school leavers from disadvantaged migrant families, so that we must reckon with a growing heterogeneity of significant familial factors and ascriptive attributes among learners with migration background.

#### **(e) Changes in family forms and the way families live together**

Against the backdrop of a persistently high divorce rate, we see a growing diversity of family forms for the period in question, which is reflected in a significant share of single parents and patchwork families (BFS, 2021a). Over the life course, we observe an increasing number of transitions, for instance, from single parent to a patchwork situation (SFSO, 2016). Quite a few youths whose parents have divorced live in more than one household, typically split between father and mother.

Mothers who live with a partner have further increased their participation in the labour force during the period in question, whereas the division of labour in matters of childcare and housework within these families has changed little during this time (Imdorf & Hupka, 2015; Levy & Widmer, 2013).

Finally, more participative styles of childrearing seem to have gained ground in Switzerland as well (Brake, 2014; Oelkers, 2008). Despite the various findings based on cross-sectional data (the PISA studies in particular), the implications of these multifarious changes in family structures and familial living for the youths are not yet sufficiently understood (for a summary, see Brake, 2014). For instance, we are currently not able to judge whether and, if so, how changes in the youths' families of origin affect these youths' well-being and educational pathways (e.g., via changes in familial support for learning).

#### **(f) ICT use**

Today, almost all youths possess their own smartphone and have access to a computer and the Internet at home at the time of entering lower-secondary education. Mobile access to the

Internet and the newly emerged social media have greatly expanded and deeply transformed the second cohort's media usage compared to the first (Waller, Willemse, Genner, Suter, & Süss, 2016). We must assume that youths' use of the Internet and social media, which varies in intensity from individual to individual and spans a broad range of subject matter, affects extra-curricular learning and skills acquisition, leisure activities and interactions within and between adolescent peer groups in diverse ways (e.g., Hinrik Schmidt, Paus-Hasebrink, & Hasebrink, 2009). Today's schools increasingly use ICT and social media as a means of instruction in class (e.g., Berger, Keller, & Moser, 2010). For the second TREE cohort, new opportunities for communication and social networking have opened up as well as uses of the Internet and social media that potentially foster creativity and the development of skills (Krüger, Keßler, & Winter, 2016; Zemp & Bodenmann, 2015). At the same time, this cohort is also exposed to new risks (e.g., new types of media addiction and compulsive gaming, cyber bullying, sexting etc.; see Bodmer, 2013; Weiss & Pöge, 2016).

#### 4.2 Commonalities in the survey programme of both cohorts

The educational and career pathways of both cohorts are the centrepiece of the survey, which has been improved over time and adapted to the situation of the second TREE cohort in terms of the instrument's ability to capture the various activities and episodes. Moreover, both cohorts were asked a set of questions pertaining to the life domains of 'family and significant others', 'socio-cultural participation' and 'health and well-being', albeit in varying degrees of detail. In principle, the survey instruments administered to the second cohort sought to establish a balance between replication with TREE1 on the one hand and innovations aiming at the improvement of the survey programme (see also section 4.4).

Another commonality between the survey programmes for the two cohorts is that both can draw on large scale assessment of skills measured at baseline, that is, at the end of compulsory education (PISA 2000 for the first cohort and AES<sup>39</sup> for the second). Whereas PISA 2000's main test domain was reading literacy skills<sup>40</sup>, the focus of AES was on mathematics. Moreover, TREE2 implemented an intelligence (kft) and a reading-speed test (Zimmermann, Gehrler, Artelt, & Weinert, 2012).

The survey modes administered in the second cohort (TREE2) are also oriented by the well-proven survey design applied to later panel waves of the first cohort.<sup>41</sup>

<sup>39</sup> Assessment of the Attainment of Educational Standards (German: ÜGK). See Hupka-Brunner et al. (2021) for details.

<sup>40</sup> With mathematics and science tests for a partial sample of about one third of the total sample.

<sup>41</sup> During the first four panel waves, the first cohort was surveyed using the paper-and-pencil mode. Questionnaire-based standardised telephone interviews (not computer-assisted) were employed as a secondary or alternative mode. Since the fifth panel wave (in 2005), the first cohort was surveyed using the two-stage survey design, which employs the CATI interview and a complementary written questionnaire also used in surveying the second cohort.

### 4.3 Particularities of TREE1

TREE1 had very little influence on the programme of its baseline survey, PISA 2000. Although PISA 2000 surveyed numerous key predictors (resources of the family of origin, current school situation, skills, plans for the next year as well as envisioned occupation at age 30), only a few questions are suitable for a longitudinal survey. For this reason, TREE mostly used other concepts in its first follow-up wave that seemed of greater significance from a longitudinal perspective. Although this break between the baseline and the follow-up surveys poses no major problem for the analysis of the transition to upper-secondary education, it does limit the ability to subject a number of concepts to longitudinal analysis. From the fifth panel wave onward (i.e., at average cohort age of about 21 years), the TREE1 survey programme was extensively adapted and expanded, as the majority of this cohort had completed upper-secondary education at this time and other issues gained (greater) significance at this point in their life course. For instance, the survey programme pertaining to partnership and starting a family was expanded in later waves. Proceeding in this manner did not always capture events or issues in a timely fashion that may have occurred in the lives of some individual respondents very early on.

### 4.4 Particularities of TREE2

A tremendous benefit of the second TREE cohort is that TREE was able to participate in designing the baseline survey to a larger extent, thus making it possible to integrate more constructs that would be of interest in the subsequent panel waves and hence considerably closing the gap between the baseline and the subsequent panel surveys (Hupka-Brunner et al., 2015). All in all, the relevance of different issues and concepts was conceptualised from a longitudinal perspective from the very beginning and implemented accordingly. An example is starting a family, which TREE1 addressed only from the fifth panel wave onward. TREE2 addresses this issue from the very beginning, so that data on starting a family early in the life course, which is rather rare in Switzerland, and its impact on educational and career pathways can be collected systematically. In addition, compared to the first cohort, more comprehensive data was collected on motivational aspects, family climate and social networks. Moreover, in contrast to TREE1 respondents, TREE2 participants were surveyed at several points in time about their media usage. In each panel wave, TREE2 also enquires not only about migration background, but also about nationality and residential status. TREE2 further considers the life domains of health and politics in more depth by means of separate survey modules for each those two domains (see Hupka-Brunner et al., 2021).



With regard to cognitive skills, TREE2 has also implemented two additional elements:

(1) Cognitive ability was assessed using a nonverbal subtest of the *Kognitiver Fähigkeitstest* (KFT 4-12, subtest N2 figure analogies, see Heller & Perleth, 2000), a well-established test which is frequently used in German performance studies.<sup>42</sup> The nonverbal subtest N2 measures deductive reasoning and is an indicator of fluid intelligence. The cognitive skills test was initially designed as a paper-and-pencil test and has been adapted by TREE for web-based online administration. After a detailed introduction, the respondents have eight minutes to solve 25 problems of figural analogy.

(2) Reading speed is considered a basic measure of reading proficiency and is implemented as a very efficient test of only two minutes' duration (Zimmermann et al., 2012). In cooperation with the German National Education Panel Survey (NEPS), TREE has adapted the test<sup>43</sup> and administered it in panel wave 1 and, as a repeated measure, in panel waves 3 and onward (see Krebs-Oesch & Sacchi, 2023 for details).

By systematically including various life domains, TREE2 has also increased the response burden (Hupka-Brunner et al., 2023). To keep this within acceptable limits across individual respondents and panel waves, we developed a concept that comprises all panel waves up to the age of 30 (both completed and planned) and defines which instruments need to be administered in which survey wave (ibid.). Selected characteristics are surveyed on the basis of an individualised, process-dependent timing. Crucial predictors of relevant outcomes are measured both cross-sectionally in selected waves (to estimate intra-individual changes) and at individualised points of measure shortly before a given critical transition.

Overall, we are confident that this balance between replication of TREE1 and innovative adjustments and extensions of TREE2 fosters the scientific community's strive to further investigate educational and labour market pathways in Switzerland in a cohort-comparative perspective (see also section 5), while at the same time allowing to address present-day issues that primarily concern the second cohort TREE2.

## 5 Conclusions and outlook

In an international perspective, TREE is one of the very few panel studies that (a) comprise more than one cohort, (b) are inter-disciplinary in their design, (c) draw on large, both nationally and regionally representative samples, and (d) cover a long observation period.

TREE's survey instruments are based on established, widely used, and versatile concepts and constructs that meet the analytical needs and interests of a variety of disciplines. This enables

<sup>42</sup> E.g., in PISA or KESS (Kompetenzen und Einstellungen von Schülerinnen und Schülern)

<sup>43</sup> Adaptation for web-based use and translation to French.

interdisciplinary and comparative research at both national and international levels. Comparability is further enhanced by the fact that, owing to Switzerland's multilingualism, TREE's survey instruments are available in four European languages (i.e. the three Swiss national languages German, French and Italian, complemented by an English version in the data documentation).

It is important to note that the TREE panel study is ongoing. This applies to both cohorts in the field to date. By the mid-2020s, the first cohort (TREE1) will have reached an average age of approximately 40 and will have responded to a total of 11 survey waves (see Figure 1). With the advent of biographical middle-age and a cumulative panel observation span of 25 years, we expect research foci to gradually shift from the school-to-work transition to other phases of the life course such as the progress of family formation or the development of further stages of respondents' professional career, including lifelong education. Likewise, the second TREE cohort (TREE2) will be in its mid-twenties on average by 2026 and will have responded to a total of seven survey waves. This will allow to analyse further stages of the cohort's transition from education to employment and young adulthood.

In step with each additional panel wave and thus extension of the panel's observation span, the potential of the TREE data for cohort comparison multiplies. Owing to the multi-cohort design of the study, the data lend themselves for cohort comparison not only at a descriptive level, but also in view of research questions pertaining to how changing macro-contexts shape the observed trajectories and affect the dynamics between structure and agency in which they unfold.

In view of the reforms and changes in the education system, the labour market and society as a whole, it seems for instance immensely promising to have a cohort-comparative look at the issue of reconciliation of family and work. Furthermore, as the measurement of skills (both at baseline and longitudinally) has been greatly refined and enhanced for the second TREE cohort, the TREE2 data will allow more in-depth analysis of skills formation throughout post-compulsory education. Finally, as we have introduced an extensive COVID-19 module in panel waves five and six (2021 and 2022) of the second cohort, the TREE2 data will also shed light on the relevance of the pandemic for education and labour market trajectories as well as other life-domains and well-being from a mid- to long-term perspective.

The promise and analytic gain of comparative research also pertains to international comparisons. In view of the effects of macro-societal contexts such as the regimes that countries adopt in the areas of family, fiscal, social and gender policy, it is, on the one hand, of utmost interest to compare the Swiss education-to-employment transition system with other VET-dominated countries such as Germany or Austria. In an extended perspective, on the other hand, it would be promising to embark on comparisons with countries characterized by a predominance of general education.

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