Childhood Determinants of Occupational Health at Older Ages

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Morten Wahrendorf and Panayotes Demakakos

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Abstract

Occupational health research increasingly recognizes the necessity to adopt a life course perspective that considers different stages of the life course to explain health later on. This approach includes not only studies that demonstrate the long-term effects of work and employment conditions on health beyond working life but also an increasing number of studies that recognize that working conditions are often related to disadvantaged circumstances at earlier stages of the life course, including childhood socioeconomic disadvantage, psychosocial adversity, and poor-quality parenting. The present chapter therefore provides an

M. Wahrendorf (✉)
Centre for Health and Society, Faculty of Medicine, Institute of Medical Sociology, Heinrich-Heine University Düsseldorf, Düsseldorf, Germany
e-mail: wahrendorf@uni-duesseldorf.de

P. Demakakos
Department of Epidemiology and Public Health, University College London, London, UK
e-mail: p.demakakos@ucl.ac.uk

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overview of life course models and research that link early life and childhood conditions with adverse work and employment conditions and adult health. Concluding remarks underline that working conditions should not be isolated from the broader life course context, especially early life and childhood factors, and point to open issues for future studies.

Keywords

Early life conditions · Life course epidemiology · Employment histories · Working conditions

Introduction

Early life and childhood are key stages of human development that are linked to numerous health outcomes in adulthood. Epidemiological research has examined early life and childhood exposures to explain health outcomes across the life course with a focus on older ages where morbidity and mortality peak. This has substantially added to our understanding of health and disease development in adulthood (Ben-Shlomo et al. 2016) and led to the realization that studying critical periods of human development, trajectories, and pathways over the life course should be an integral part of any inquiry into disease causation. Such a life course approach – combined with the conceptual framework of the social determinants of health – shifts our attention to fundamental causes or "upstream" factors and the societal context. This had led to a considerable expansion of the dominant paradigm of risk factor epidemiology: from a static to a more dynamic one. As a result, health is now considered the product of multiple factors that interact over the life course within societal, historical, and cultural contexts.

Models of Life Course Epidemiology

To understand better the links between early life and health at older ages, life course epidemiology has proposed different conceptual models. These models help to elucidate the way disease develops across the life course (Kuh and Ben-Shlomo 2004). The main life course health models are the following: the accumulation of risk model, the pathways model, and the critical-sensitive period model (Kuh et al. 2003).

The accumulation of risk model is based on the idea that people are exposed to multiple risk factors over the life course and that ill-health is a product of the accumulation of these risk factors across the life course (Kuh et al. 2003). The accumulation of risk model is in essence an "attrition" model that represents ill-health as the product of a process of gradual loss of health reserve, where each risk factor exerts an independent effect on health. The more the "insults," and the more powerful they are, the greater the health damage and the earlier its manifestation. The

implicit assumptions of this model are the differential exposure to risk factors, both in terms of intensity and timing of the exposure, and differences in vulnerability, resilience, and availability and access to protective factors. Everyone is exposed to multiple risk factors and their cumulative effect, but some individuals are exposed earlier and much more than other. The accumulation of risk model also implicitly presupposes that risk factors often cluster together either concurrently (several risk factors at the same time) or longitudinally (several risk factors across the life course). If severe health-damaging exposures start accumulating early in life, especially in combination with limited access to protective factors and low levels of resilience, then this likely will expedite the normal wear-and-tear of bodily functions with some individuals never being able to achieve their full health potential and experiencing a lifetime of suboptimal health.

The pathways model is based on the idea that there are pathways that enable and mediate the association between an initial exposure and an adverse health outcome. In contrast to the risk accumulation model (where each risk factor exerts an independent effect on health), the assumption is that the action of a risk factor, usually early in life, triggers and catalyzes the action of other risk factors and initiates a long-term sequence of risk, which leads to increased risk of ill-health, disease, and death. This sequential process is causal in the sense that each part of it is caused by a previous part and will cause the next one. The conceptualization of this process as sequential contributes to a better understanding of the hierarchical and chronological ordering of the different interacting factors but obscures the fact there might be multiple interconnected pathways leading from an initial exposure to ill-health. For example, there are multiple interrelated biological, behavioral, psychological, and social pathways that link social disadvantage in childhood with ill-health later in life. The pathways model is an accumulation of risk model in the sense that it presupposes the cumulative action of multiple risk factors as a necessary condition for health to deteriorate and disease to develop, but in addition, it is a model that concentrates on the pathogenic processes leading to ill-health and highlights the importance of mediating factors. The focus on the process and mediating factors not only improves our understanding of disease aetiology but most importantly helps to identify prevention targets at different stages of the life course – parts of the causal pathways that are amenable to change and can be targeted by prevention strategies.

The critical-sensitive period model focuses on the long-term health consequences of the action of risk factors during periods that are critical for human development (Ben-Shlomo and Kuh 2002). The core idea is that the action of risk factors during periods of maturation and development, when the brain and other systems, organs, and functions in the human body are particular plastic and sensitive to external stimuli, has the potential to bring about permanent bodily or functional changes that can reduce the health potential and increase the risk of disease and premature death later in life. There is no consensus about the subtle differences between critical and sensitive periods, and these terms have been used loosely and interchangeably to describe important periods of human development. It can be supported that a critical period is a developmental stage during which the action of risk factors will irreversibly affect normal development (Kuh and Ben-Shlomo 2004; Voss 2013). A

sensitive period is a developmental stage during which the action of risk factors can be disproportionately damaging, but is neither irreversible nor necessarily inhibitory of normal development. Critical periods can be seen as a subset of sensitive periods (Voss 2013).

An example of a critical period is the period of fetal growth. Risk factors that affect fetal growth and in utero development can inflict irreversible lifelong health damage. The archetypical application of the critical period model is the fetal origins hypothesis by Barker, which postulates that inadequate nutrition in utero, as measured by birth weight, will result in increased risk of obesity, metabolic abnormalities, and cardiovascular disease in adulthood (Barker 1990; Barker et al. 2002). A key aspect of the critical-sensitive period model is latency; the health consequences of the pathogenic action of risk factors during critical-sensitive periods of human development might be latent and take decades to realize and manifest as disease at older ages. Another key feature is that of "biological programming"; the action of risk factors during critical-sensitive periods of human development triggers a cascade of subclinical biological changes, which decades later might result in disease. The critical-sensitive period model is not an accumulation model. Under this model, no accumulation of "insults" is necessary for disease to develop at older ages; the action of a single risk factor during a critical period of development is potent enough to initiate a biological cascade that would result in disease later in life. Further, it does not presuppose the existence of multiple adult mediators. In fact, it postulates that the opposite can also be true; a damaging exposure in early life or childhood can directly via biological mechanisms be associated with disease later in life with little, if any, mediation by adult factors.

Taken together, the three life course health models describe and specify how early life and childhood factors may lead to poor health at older ages. These models are not supposed to be mutually exclusive and can act in parallel. But each model has a different focus; risk factors may either have direct independent consequences if they occur during a critical period (critical period model) or indirectly affect health through intermediate factors (pathway model) or cluster with additional risk factors that each negatively affects health later on (risk accumulation model).

The Three Childhood "Pillars" of Lifelong Heath

Given the importance of socioeconomic position (SEP) within the social determinants of health framework, and a voluminous literature suggesting a causal association between SEP and health, effort has been put to examine the role of childhood SEP and adult health. There is extensive evidence suggesting associations between childhood SEP and adult health outcomes. Galobardes et al. found that lower childhood SEP is associated with increased risk of all-cause and cause-specific mortality (Galobardes et al. 2004). They found particularly strong inverse associations between childhood SEP and mortality from stomach cancer and hemorrhagic stroke mortality, while childhood SEP was also inversely associated with mortality from coronary heart disease, lung cancer, and respiratory-related diseases and

possibly external and alcohol-related causes. Furthermore, a recent review found significant associations between lower maternal and paternal education and suicide risk (Orri et al. 2019). Childhood SEP is also inversely associated with the risk of cardiovascular disease, especially stroke (Galobardes et al. 2006), diabetes (Demakakos et al. 2012; Tamayo et al. 2010), and established adult cardio-metabolic risk factors such as obesity (El-Sayed et al. 2012; Slopen et al. 2012), reduced physical activity (Elhakeem et al. 2015; Juneau et al. 2015), and chronic inflammation (Liu et al. 2017; Milaniak and Jaffee 2019). In relation to cancer, lower SEP in childhood is associated with increased risk of stomach and lung cancer and possibly colorectal, liver, cervical, and pancreatic cancer (Vohra et al. 2016).

Another set of childhood risk factors that has been proven to be a major determinant of lifelong health are adverse childhood experiences. Adverse childhood experiences (ACEs) are an umbrella term for a variety of negative exposures and experiences in childhood including experiences of neglect, abuse, having been brought up in a risky and adverse family environment, having lived in children's home or with foster parents, and unfavorable life events and circumstances such as the parental death and being reared in a single-parent family. All these powerful and overwhelming negative experiences can affect human development and consequently adult health in different ways. It was the original ACE study in California, USA, that has sparked interest in childhood experiences of abuse and risky family environments as major determinants of adult health (Felitti et al. 2019). Since then, there has been a growing interest in ACE and their association with health (Herzog and Schmahl 2018; Hughes et al. 2017). Most major chronic diseases are positively associated with ACE including cardiovascular disease (Appleton et al. 2017; Su et al. 2015), diabetes (Huang et al. 2015), and cancer (Holman et al. 2016), while unhealthy behaviors such as substance abuse and sexual risk taking and mental health problems are very strongly associated with ACE (Hughes et al. 2017; Norman et al. 2012).

A third emerging factor, which is important for human development and consequently for adult health, is the parent-child relationship and one's childhood experiences of parenting (Demakakos et al. 2016). The focus here is not on abusive parents or neglectful parenting, which is best classified as ACE, but rather on everyday parenting style and practices, the ordinary interaction between parent and child within the normal behavioral range, and what is transmitted through this relationship to the child. An unsatisfactory problematic relationship with parents that is characterized by limited care and affection, overprotection, autonomy restriction, and lack of parental involvement can be a chronic stressor from which influence the child cannot easily escape.

Most people have been brought up by natural or adopted parents, and consequently their relationship with their parents exerted a catalytic formative influence on their cognitive, emotional, psychosocial, and physical development. The relationship with one's parents is one of the most important social relationship one may have in their lifetime. From a child's perspective, the relationship with the parents is the single most important relationship during the period between birth and adolescence. Evidence suggests that experiences of poor-quality parent-child relationship and

parenting are associated with multiple developmental problems including a dysregulated stress response (Lupien et al. 2009), obesity (Sleddens et al. 2011), risky behaviors, and aggression (Chan and Koo 2010; Kawabata et al. 2011). There is also evidence linking poor quality parent-child relationship with adult psychopathology (Weich et al. 2009), but very limited research has focused on the effect of poor-quality stress-generating parenting on the offspring's physical health at older ages. Recent findings suggest that poor-quality parenting style, characterized by limited maternal and paternal care, overprotection, and autonomy restriction, is associated with an increased risk of all-cause mortality, incident and prevalent cancer, and adverse reproductive outcomes (Demakakos et al. 2016, 2018, 2019), but more research is needed to establish how damaging is poor-quality stress-generating parenting for offspring's health over the life course.

On the basis of both theory and empirical evidence, it can convincingly be argued that the three factors, socioeconomic disadvantage, psychosocial adversity, and poor-quality parenting, are major childhood exposures that have the potential to determine health over the life course and should be conceptualized as the three childhood "pillars" of lifelong health. The interrelationships between these three exposures have yet to be fully understood in relation to health over the life course. A recent review suggested that ACE are associated with low childhood SEP and should not be examined as decontextualized "individual" characteristics but rather as products of socioeconomic position and social disadvantage (Walsh et al. 2019). Given the complexity of this association and the existence of different types of ACE, it is clear that much more research is needed on this key issue – especially when evidence has convincingly showed that ACE are associated with adult health independently of childhood SEP (Kelly-Irving et al. 2013).

Adult Mediators: The Case of Work Stress and Adverse Working Conditions

The risk accumulation and the pathways models require the action of adult factors to enable, catalyze, and effectuate the influence of childhood exposures on adult health. Labor force participation and working conditions are known to be strongly associated with health at older ages with unemployment, adverse working conditions, and work stress being major risk factors for health (Marmot et al. 2006). Based on these assumptions and the centrality of work in adult life, adverse working conditions and work-stress can be important adult mediators linking childhood disadvantage and psychosocial adversity with health at older ages. The critical-sensitive model is mostly about the biological cascade that childhood exposures initiate, which involves different stress-related biological pathways including immune, neuroendocrine, and epigenetic pathways that can jeopardize health in adulthood with little mediation by adult factors (Agorastos et al. 2019). While the possibility of a direct biological effect is very real, it does not preclude the possibility of synergies and interactions between the biological cascade that was initiated by the childhood exposure and adult factors. In fact, such synergies are expected given that many of

the stress-related biological adaptations affect multiple domains of human life. In the case of adverse working conditions, it is expected that a person with a dysregulated stress response would be more vulnerable to work stress, while ACEs are known to be associated with a greater allostatic load (Danese and McEwen 2012), which effect on human health would only be exacerbated by adverse working conditions.

The rest of the chapter will examine how early life conditions, in terms of the three major childhood exposures described above (socioeconomic disadvantage, psychosocial adversity, and poor-quality parenting) may be related with adverse working conditions and present existing evidence.

Why Should Early Life and Childhood Circumstances Lead to Adverse Employment Histories and More Stress at Work?: Some Conceptual Thoughts

To answer the question why early life and childhood exposures are linked to adverse working conditions, it appears helpful to study this association in the light of three potential mechanisms: (1) social causation, (2) stress responsiveness, and (3) health selection.

Social Causation

Probably the most obvious explanation for why early life and childhood conditions are linked to poor working conditions follows the idea of "risk accumulation" (Dannefer 2003), where people growing up in a context of socioeconomic adversity are more likely to end up in poor jobs – especially through lower educational attainment. This includes working in jobs that generally involve more stress (e.g., low-skilled occupation) and affect one's entire career pattern (Caspi et al. 1998) leading to discontinuous and precarious careers. Likewise, psychosocial adversity and poor-quality parenting during childhood may also impact later life working conditions. Early life and childhood may therefore be seen as the starting point in one's work trajectory with obvious implications for the nature of jobs one has and their working careers.

Stress Perception

Stress theory postulates that the experience of job stress is determined not only by the nature of a job but also by individual perception of the situation faced (or "appraisal"). Specifically, according to transactional models of stress processing (Lazarus and Folkman 1984), situations are only perceived and recognized as stressful, if individuals appraise the situation as challenging or threatening and believe that the available resources are not sufficient to cope with the threat (often labeled "primary" and "secondary" appraisal, respectively). This means that there is no uniform perception of the same stressor and that not all individuals who face the same working conditions

will report the same levels of stress. A personal report of stress depends not only on the nature of the job but also on individuals' appraisal of the situation and available resources and coping abilities (McLaughlin et al. 2010). These coping abilities may be less adequate for people who grew up under disadvantaged circumstances during childhood (Kristenson 2006), which may be a "critical" or "sensitive" period for the development of effective coping skills and strategies. Psychosocial adversity and poor-quality parenting may be particularly important, and disadvantaged children may be at higher risk of perceiving and reporting more stress in adulthood (McEwen 2012). Studies showing that the developing child brain is more receptive to adversity than the adult brain further support our hypothesis that childhood is a critical period for the development of effective appraisal and coping skills. These studies show that the recurrent experience of stress during childhood affects both the size and the structure of the brain and the threshold at which stress regulation is activated at older ages (Shonkoff et al. 2009; Sapolsky 2004). In these cases, it is less the nature of the job and more the underdeveloped coping abilities that lead to an increased perception and recognition of stress at work at older ages (Kristenson 2006; Yoshikawa et al. 2012; Ohtaki et al. 2017).

Health Selection

A third explanation of why early childhood conditions may be linked to experiencing higher levels of stress at work has as a starting point one's health status in childhood and its consequences for one's career and later work and employment conditions. Specifically, because adverse childhood conditions are often accompanied by poor health, it is likely that children with poorer health are selected into unfavorable jobs in adulthood. Young people with chronic illnesses or disabilities, for example, may be less likely to gain a high educational degree, which in turn influences opportunities on the labor market (Caspi et al. 1998). Poor health, therefore, may force to enter occupations with less reputation and employment security, that is, to work under precarious and stressful working conditions.

In summary, early childhood may be linked to different levels of stress during working life in three ways: (1) early life and childhood adversity including socioeconomic disadvantage may influence the nature of subsequent working careers and the jobs a person has (social causation), (2) early life and childhood adversity may influence the extent to which work and employment conditions are perceived as stressful and stress response (stress responsiveness), and (3) early life and childhood adversity leads to poor childhood health, which, in turn, may influence opportunities in the labor market (health selection).

Empirical Evidence

The next section reviews evidence on the association between early life and childhood factors and adverse employment during adulthood. The term adverse employment includes both psychosocial stress during working life and career

characteristics. The review relied on a search in popular databases (e.g., Pubmed and Scopus) and studies that have been collected over the years in own reference management systems. The section does not aim to provide a systematic literature review but rather to summarize current empirical evidence. Only studies that were published in peer-reviewed journals were considered. Table 1 lists all the studies and presents some key characteristics, such as a brief description of the sample, the study design, as well as how childhood conditions and adverse employment were measured and a brief summary of the main finding.

With regard to study design, many of the examined studies analyzed birth cohorts (Elovainio et al. 2007; Power et al. 2002; Power and Matthews 1997; Kuh et al. 1997) or cohorts of adolescents (Westerlund et al. 2012; Hemmingsson and Lundberg 2006). In these studies, information on childhood conditions usually referred to life circumstances at birth or childhood. However, most of these cohorts, especially those using birth cohort data, are still relatively young and consequently can only be used to assess working conditions up until midlife (Kuh et al. 1997; Westerlund et al. 2012). In contrast, a growing number of studies examined the association between retrospectively collected information on childhood conditions and current work and employment conditions (Hardcastle et al. 2018; Sampasa-Kanyinga et al. 2018; Wang et al. 2018; Flores and Kalwij 2014). Finally, some studies used data where both childhood conditions and working conditions were measured retrospectively. In that case, information on working conditions also covered an extended time frame that included characteristics of entire working careers (Hoven et al. 2017; Wahrendorf and Blane 2015; Wahrendorf and Siegrist 2014).

In relation to the measurement of childhood conditions, measures were heterogeneous across studies and covered different aspect of the three childhood "pillars" described above (socioeconomic disadvantage, psychosocial adversity, and poor-quality parenting). Measures either summarized different types of adversity into an overall index or "adverse childhood experience (ACE) score" (Hardcastle et al. 2018; Wahrendorf and Blane 2015; Westerlund et al. 2012; Sampasa-Kanyinga et al. 2018) or investigated the impact of individual childhood factors (e.g., Power et al. 2002). More specifically, studies measured dimensions of childhood adversity that pertained to child abuse (Sampasa-Kanyinga et al. 2018), problematic family environment (Power et al. 2002), relationships with parents, and mental and physical illness of parents (Westerlund et al. 2012; Power et al. 2002), housing quality (Wang et al. 2018; Wahrendorf and Blane 2015), educational support (Power et al. 2002; Kuh et al. 1997), the experience of major life events (Kuh et al. 1997; Westerlund et al. 2012), as well as material and socioeconomic circumstances during childhood. With the exception of three studies (Westerlund et al. 2012; Hardcastle et al. 2018; Sampasa-Kanyinga et al. 2018), all other studies also considered father's occupational position (at birth or during childhood).

Turning to the measurement of adverse employment during adulthood, some studies focused on individual perceptions of stress at work (often measured according to the DC-Model or ERI (Hintsa et al. 2010; Wahrendorf and Siegrist 2014; Westerlund et al. 2012; Elovainio et al. 2007)). Other studies used more "objective" factors that describe employment situations (e.g., unemployment (Flores

Table 1 Overview of studies investigating associations between early childhood and adverse employment during adulthood

Author, year	Sample	Study design	Measure of early childhood	Measure of adverse employment history	Main finding
Hardcastle et al. (2018)	2881 men and women in England and Wales (aged 18–69 years)	Representative cross-sectional study in 2015 with retrospective information on childhood conditions	Index measuring adverse childhood experiences (ACEs) based on nine forms of abuse and family dysfunction before 18	Current employment situation (unemployment and long term sickness absence)	ACEs are related to unemployment and long-term sickness absence, irrespective of educational attainment
Sasmpasa-Kanyinga et al. (2018)	14,518 working men and women aged 20 to 74 in Canada	Representative cross-sectional study in 2012 with retrospective information on childhood abuse	Childhood experience of violence questionnaire (CEVQ) covering physical abuse, sexual abuse, and witnessing family violence	Various measures of current work stress, incl. self-perceived work stress, job insecurity, and stress according to the demand-control model (measured in terms of single dimensions and job strain)	Child abuse is associated with all measures of work stress (irrespective of current occupational position, education, income, and lifetime mental disorders)
Wang et al. (2018)	1390 working men and women age between 31 and 41 years in Australia	Cohort study (baseline 1985 with two follow-ups (2004–2006 and 2009–2011)	Socioeconomic position (SEP) at the age of 12 (incl. education and occupation of parents, number of rooms, and home ownership), as well as school-related factors (e.g., engagement) and health during childhood	Effort-reward imbalance (ERI; measured as ERI-ratio)	Poor childhood health is related to higher ERI, but no consistent associations were found between childhood SEP and the ERI-ratio
Hoven et al. (2017)	5857 men and women aged 70 or older in Europe	Cohort study with retrospective information on employment histories	Occupational position of main breadwinner at the age of 10	Typology of late life employment histories (derived with sequences analyses)	Early adversity is associated with discontinuous histories

		and childhood conditions (SHARE)			and histories with preliminary retirement
Wahrendorf and Blane (2015)	10,272 retired men and women in Europe (aged 50–80)	Cohort study with retrospective information on employment histories and childhood conditions (SHARE)	Index combining four measures of adverse socioeconomic conditions at age 10 (books in the household, father's occupation, overcrowding, and housing quality)	Labor market disadvantage through involuntary job loss, low main occupational position, and episode of unemployment	For both men and women, childhood adversity was related to labor market disadvantages
Flores and Kalwij (2014)	25,296 observations (based on 5999 men and 7614 women, aged 50–64)	Cohort study with retrospective information on childhood conditions (SHARE)	Three measures of adverse socioeconomic conditions at age 10 (books in the household, father's occupation, and overcrowding)	Employment situation at older ages (in paid work or not)	Higher childhood SEP is related to higher employment probability at older ages. Same is true for childhood health
Wahrendorf and Siegrist (2014)	11,181 retired men and women in Europe	Cohort study with retrospective information on childhood conditions (SHARE)	Index combining four measures of adverse socioeconomic conditions at age 10 (books in the household, father's occupation, overcrowding, and housing quality)	Stressful work based on work stress in main job (referring to core dimension of the DC- and ERI model) and an overall assessment of the entire occupational career, as well as labor market disadvantage through involuntary job loss, low main occupational position and episode of unemployment	Childhood adversity is both related to stressful work and labor market disadvantage. Links between early childhood and stressful work are partly explained by labor market disadvantage

(continued)

Table 1 (continued)

Author, year	Sample	Study design	Measure of early childhood	Measure of adverse employment history	Main finding
Westerlund et al. (2012)	673 men and women in Sweden (aged 43 in 2008)	Population-based cohort study (aged 16 at baseline in 1981, and 4 follow-ups till 2008)	Index counting the presence of six conditions at age 16: Residential mobility, residential crowding, parental loss, parental unemployment, parental physical illness, and parental mental illness	Job strain (incl. single scales) at age 43 based on the demand-control questionnaire (DCQ)	No consistent association between early childhood and probability of high job strain, but support for higher vulnerability (for AL) once persons with adverse childhoods are exposed
Hintsa et al. (2010)	6435 British men aged 35–55 years	Cohort study with retrospective information on childhood conditions (Whitehall II study)	Socioeconomic position (father's education and occupational class), and number of siblings	Job demand and job control (based on the JCQ-questionnaire) and organizational justice	Low job control was related to low parental education or social class and greater number of siblings. Results for job demands and organizational justice were less consistent
Elovainio et al. (2007)	4293 men and women in Finland (aged 31 at follow-up)	Prospective birth cohort study (baseline 1966 and follow-ups at age 14 and 31)	Father's occupation at birth and educational factors at age 14 (learning difficulties, teacher ratings, school absence)	Job strain (incl. single scales) at age 31 based on the demand-control questionnaire (DCQ)	Lower parental occupational position is linked to psychosocial stress, particular low control, and job strain
Hemmingsson and Lundberg (2006)	49,323 men in Sweden (aged 40–53 during follow-up)	Prospective cohort study with young Swedish males (aged 9–11) based on census data from 1960 and follow-ups in 1985 and 1990, combined with	Father's occupation at birth, overcrowding till the age of 16 and 9–11 (given by parents)	Job control (measured indirectly on the basis of occupational titles when respondents were 39–41 years)	Adverse childhood circumstances were clearly linked to lower job control during adulthood

		administrative data (death register till 2002)			
Power et al. (2002)	12,537 British men and women (at the age of 33)	Birth cohort study (1958 British birth cohort) baseline in 1958 with repeated follow-ups till the age of 33	Fathers occupational position at birth, housing tenure at age 11, overcrowding before age 16, as educational support from parents (reading and interest shown in education), family moves, parental divorce or death during childhood, alcoholism in the family	Reported job insecurity at age 23 and 33, unemployment before age 33, work demands and level of job control at age 33	Adversity during childhood is associated with poor working conditions during adulthood, including job insecurity, unemployment, and psychosocial work factors
Power and Matthews (1997)	11,407 British men and women (at the age of 33)	Birth cohort study (1958 British birth cohort) baseline in 1958 with repeated follow-ups till the age of 33	Fathers occupational position at birth	Unemployment episode till the age of 33, experience of job insecurity at age 23 and 33, negative psychosocial work characteristics	Negative association between higher occupational position and adverse working conditions till the age of 33, including job insecurity and poor psychosocial conditions
Kuh et al. (1997)	1628 women aged 43	Birth cohort study (1946 British birth cohort) baseline in 1946 with 19 follow-ups	Fathers occupation at age 11, family size, parental education, death of parent, divorce of parents during childhood	Time spent in current job, months not in paid work, between 36 and 43	Adverse childhood circumstances are linked with economic success, most importantly via educational attainment

and Kalwij 2014; Hardcastle et al. 2018; Power and Matthews 1997)) or characteristics of entire employment careers (e.g., involuntary job losses or typology of histories (Hoven et al. 2017; Wahrendorf and Siegrist 2014)).

Despite heterogeneity in the measurement of childhood adversity, the overall picture clearly points to an association between adversity during childhood and adverse employment during adulthood. In the case of psychosocial work characteristics, this holds true for perceived job insecurity (Power et al. 2002; Power and Matthews 1997), perceived stress at work (Hemmingsson and Lundberg 2006; Wang et al. 2018), and an overall career assessment (Wahrendorf and Siegrist 2014). In addition, there are associations between childhood adversity and unemployment (Hardcastle et al. 2018; Flores and Kalwij 2014), discontinuous employment histories, and weaker labor market attachment (Hoven et al. 2017 ; Kuh et al. 1997).

Some studies explored the role of potential mediators in these associations. Education was found to be an important mediator (and to reduce associations once considered), but most studies suggest that educational attainment could not entirely explain the reported associations (Hardcastle et al. 2018; Power et al. 2002). The same held true for occupational position or income during working life (Wahrendorf and Siegrist 2014). While this finding suggests that education or occupational position partly explain the association between childhood factors and working condition, it also suggests that parts of the association between childhood factors and work stress and adverse employment remain largely unexplained. It remains unclear, however, if the unexplained part is due to differences in coping abilities.

Summary and Concluding Remarks

This chapter provides a summary of some core perspectives of life course research and illustrates how these could help to understand better occupational health within a life course framework. The focus was on three different childhood factors, childhood SEP, psychosocial adversity, and poor-quality parenting, and the chapter described how these factors may be linked to poor working conditions during adulthood. Despite heterogeneity in their measurement, evidence suggests that these three childhood factors are related to adverse employment during adulthood, both in terms of work stress or adverse employment histories. The majority of studies indicates that adverse working conditions are due to social causation or "risk accumulation" (where poor childhood conditions lead to further disadvantages later in life). However, much more research is needed to understand the underlying mechanisms. For example, the role of coping abilities in explaining differences in adverse employment remains largely unclear. In this context, a pertinent question would be to examine if childhood adversity increases one's vulnerability to adverse employment and the role of coping mechanisms in this association. Despite the necessity to investigate the role of coping mechanisms in greater detail, this chapter also shows that a more critical and systematic measurement of childhood factors is needed, with a measurement approach that goes beyond the use of adverse childhood experience (ACE) summary scores (Appleton et al. 2017; Kelly-Irving and Delpierre

2019; Lacey and Minnis 2019). Along these lines, the chapter distinguished between three different childhood factors, childhood SEP, psychosocial adversity, and poor-quality parenting, and described how each of these three factors could lead to poor occupational health later in life.

To conclude, in relation to occupational health research, this chapter suggests that life course epidemiology is much more than just linking work exposures to health at older ages. Adverse employment during adulthood is often a part of greater trajectories of disadvantage that often started in early life and childhood. Although more research is needed to understand the implicated mechanisms, this chapter illustrates how a life course framework could help to understand better occupational health and highlights a growing number of studies in this field. Future research should add to our understanding of the role of childhood factors in employment and health in adulthood and elucidate how childhood factors are related to adverse employment and poorer health at older age – this may help to develop more effective prevention programs and policies.

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