

## Neurocognitive Development through Systematic Knowledge Compilation among Young Adults

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### Abstract

According to The National Board of Health and Welfare in Sweden almost 190.000 children and young adults suffer from mental illness. Between 2006 and 2016 there was also a 70 percent increase in this kind of unhealth in the age group of between 18 and 24 years. Regarding the extent of mental ill health, this situation is considered to indicate causality in terms of living conditions during the entry into the labor market and adult life. The influences of knowledge accumulation are discussed.

**Keywords:** Neurocognition; Knowledge; Mental health

### Introduction

In the creation of a salutary working-life and/or career debut, a systematic knowledge compilation in the context of neurocognitive development among young adults poses an important condition [1-3]. The superior physical strength and mental speed of a young individual may conceal easily the vulnerability from the immaturity of both the individual brain anatomy and patterns of function of the brain that last until the age of 30 years. In addition to this still ongoing organic development in young adults they also have to develop necessary automatized functions patterns in the brain that are of dominating significance for everyday functioning. These automatized functions in terms of skills or implicit knowledge could in everyday language be translated into being “an experienced person”. The training of the brain in this regard is based on ongoing everyday experiences of the individual that in turn employ increased mental effort from the already mentioned still maturing functions of the brain. At the same time, these s.c. executive functions are very sensitive to stress. Logically, it appears that with the entry into the middle age the stress from working life decreases. In line with this, researchers have from functional magnetic imaging (fMRI) shown how young physicians presented effortful increase in brain activity during stress as compared to middle aged colleagues who instead used their brain resources “economically” based on the from experience exercised patterns of function that were protective concerning load from demanding work related tasks. In our time life is marked by an excess of processing decisions, intensity of information and a working life without boundaries between work, home and leisure. The knowledge on the neurocognitive level of qualification of specifically the young is presently insufficiently known and summed up. An important objective is therefor to scientifically and systematically search the literature and to examine and to put together what is found and translate these findings into assignments regarding the psychosocial working environment in terms of structuring support.

### Psychological Health during Youth

According to the report “Development of mental illness among children and young adults until 2016” from The National Board of Health and Welfare, close to 190 000 children and young adults in Sweden suffer from mental health issues and the increase during the last decade has been dramatic. In the age group between 18-24 years the increase between 2006 and 2016 corresponds to 70 percent and the new sickness cases are also long-lasting. In the leading morning paper Dagens Nyheter on the 12<sup>th</sup> of December 2017 the assessment

from The Nations Board of Health and Welfare is described in terms of that stress from the current situation concerning school or situation in life needs to be identified early in the process of care. The authority also put emphasis on that since the extent of suboptimal mental health concerns a large part of the total group of young persons. According to The National Board of Health and Welfare this suggests that more general causes concerns conditions of life during the period of in time in school or at the entry into working life.

### The Obvious Strengths of the Young should not be Confused with their Neurocognitive Needs

The obviously superior resources in young persons could be described in terms of that e.g. oxygen metabolism (fitness) in 20 year olds is in average 60% higher than in 60 year olds [4]. The same applies to the comparably superior speed concerning mental abilities [5].

The image of the physical strengths of young individuals creates a risk concerning the remaining organic developmental needs regarding the anatomy and functional patterns of the brain are forgotten at the same time as the developmental needs at a nervous cell and nervous cell -communication level remains until age 30 [6]. Parallel to this organic maturational process there is also a need to build a “bank” of automatized mental functions. This training of the brain is based on the ongoing experiences of the individual and is even of domineering importance for every day functioning. This training of the brain is done through the so called executive functions [7] that flexibly register and deal with what is new and unique in every situation. The training is done through a sharp increase in mental effort [7,8]. According to Bargh [8] these automatizations are thereafter the servants of the brain who play the part of releasing capacity for executive tasks. At the same time as the executive functions are those who conquer the

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automatisations the executive functions are not fully developed in young adults [9]. These in young individuals intensively used executive functions (that in the young still are at an immature stage) are in all ages very vulnerable to different kinds of stress, sorrows and lack of fitness/a physical bad condition, insufficient sleep [7] or emotional load Arnsten [10]. Diamond [7] describes also how a disadvantaged executive function diminishes the ability to reasoning logically, solving problems or execute control over life.

The significance of a good executive functioning is also its connection to mental health [11]. Zoer et al. [12] describe specifically the vulnerabilities of the young in working life in terms of an increased risk for mental health issues based on high emotional demands in working life.

### The Ability of Working Life to Benefit or not to Benefit Health

That stress from work seems to diminish by increasing age was documented by e.g. the Swedish Union of University Graduates of Law, Business Administration and Economics, Computer and Systems Science, Personnel Management [12-14]. From the AFA Sweden's labour market parties owned Insurance organization research project nr 130329 is clearly shown a heightened work related fatigue in ¼ of the participant in the age group of 18-35 years. In the other age groups the corresponding figures were 1/6 (Wentz, manuscript in preparation). A recently published report from the Swedish Working environment Authority also shows that in the age group 16-29 years there is an increased rate during two years (from 25 to 35 percent) of employees that assess the demands at work as higher or much higher than their own corresponding knowledge or skills. For an association between suboptimal mental health and less favorable working conditions speaks also Melchior et al. [15] who found that work stress appears to precipitate depression and anxiety in previously healthy young employees. From a more mechanistic perspective Durning et al. [16] used functional magnetic resonance imaging (fMRI) and examined the functional patterns of the brain in younger and middle aged healthy employed physicians. During the experimental condition both groups of physicians processed clinically relevant tasks and a significantly different pattern of functioning of the brain was recorded from the younger group of participants with also defined but limited symptoms of emotional exhaustion. In this group the activity in the frontal lobe was reduces while in other parts of the brain it was clearly increased. This pattern of functioning added to an already high level of load regarding the brain. This pattern did not concern the middle-aged group with similar symptoms. The older group of physicians instead used the total resource of their brains economically through exercised and thereby automatized functions which counteracted the effect from emotional exhaustion complaints.

### Relevance

Our time is marked by an abundance of processing of decisions [11] a working life without boundaries between work, home and leisure [17], intensity of information at work and insecure employments. At the same time the knowledge about the neurocognitive presumptions and thereby also the needs of young adults in working life is insufficiently compiled and known and therefore also not applicable. The specific neurocognitive needs of the young have to be systematically investigated based on current results from research in order for concrete applications to be made possible in working life in turn aiming at safety and health, development and socioeconomic security.

### Conclusion

An important task in today's society is to carry out a scientific systematic search of the literature and compile the current situation of knowledge about the neurocognitive needs of young individuals in working life from the perspective of a not fully matured central nervous system and an unfinished development of automatizations regarding cognitive functioning. Such a put together result should be presented in an applicable form with specific instructions regarding the psychosocial work environment of the young. The expected result concerns that this research based knowledge could mean foundations regarding advice and guidance concerning the needs of young adults that sets of from their neurocognitive developmental level. This knowledge needs to be integrated into working life. Methods that can meet the needs of young persons with a not fully matured executive functioning in terms of the ability to plan or using problem solving skills or setting boundaries might deal with a genuine introduction at the work place, reinforced and encouraging work management and mentorship. Solid experience regarding work should be regarded as more important for mental health in working life. When this experience is successively built up the need for e.g. tutoring/guidance and structuring support could be much more acknowledged. The significance of different kinds of insecure employments could appear and the mentally stressful exposure to working life of young individuals could thus be counteracted.

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