

# Adult Learning Open University Determinants study (ALOOD): Biological lifestyle factors associated with study success

Citation for published version (APA):

Gijselaers, J., De Groot, R., & Kirschner, P. A. (2012). *Adult Learning Open University Determinants study (ALOOD): Biological lifestyle factors associated with study success*. Poster session presented at ICO International Fallschool 2012, Girona, Spain.

## Document status and date:

Published: 14/11/2012

## Document Version:

Peer reviewed version

## Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
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- The final published version features the final layout of the paper including the volume, issue and page numbers.

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# **Adult Learning Open University Determinants study (ALoud): biological lifestyle factors associated with study success**

## ***Introduction***

Life expectancies keep rising as our society develops (The World Bank, 2012). Changes in our knowledge economy are fast and as a result the value of personal knowledge and experience diminishes at a high rate. This leads to an ongoing demand for employees to develop their knowledge and experience far into adult age. However, the ability to learn decreases over time. Research shows that biological lifestyle factors can possibly influence the ability to learn. Probably this is partly caused as cognition is a key condition for normal learning (Bull & Scerif, 2001; Espy et al., 2004) and cognition can be influenced by biological lifestyle factors (Barenberg, Berse, & Dutke, 2011; H Taras, 2005; Howard Taras & Potts-Datema, 2005).

Three biological lifestyle factors which are associated with learning, study success, academic achievement, and/or cognition are the focus of this study. These biological lifestyle factors are physical activity (Barenberg et al., 2011), sleep (Curcio, Ferrara, & De Gennaro, 2006), and nutrition (Kesse-Guyot et al., 2012). Physical activity leads to increased cerebral blood flow (CBF), neuronal repair and plasticity modulated by neurotrophins, and upregulation of particular neurotransmitters (i.e. norepinephrine and dopamine) (Barenberg et al., 2011). The exact function of sleep is unknown, but it is related to plasticity in the brain. Furthermore, the storage and consolidation of information acquired during the previously waking period is promoted by sleep (Hobson & Pace-Schott, 2002). Nutrition provides the body with not only energy, but also with important building blocks for the different parts, such as cell membranes, enzymes, and neurotransmitters, that maintain correct functioning of the body and especially the brain. Neurotropic and neuroendocrine factors are affected by nutritional status. These factors, such as for instance the growth factor brain-derived neurotropic factor (BDNF), affect learning and memory (Dauncey, 2009). Maintaining a positive balance within these biological factors through lifestyle could lead to increased cognitive function which could contribute to study success.

Research into the effects of biological lifestyle factors on cognition and/or school performance has been done within primary, secondary, and university education. However,

research into these biological lifestyle factors with regard to adults is lacking. The goal is to gain insight in the association between biological lifestyle factors and study success in adults participating in distance education. Expected is that healthy lifestyles will be positively associated with study success. The results will offer possibilities to develop tailored strategies to enhance study success of students in adult education.

## ***Methods***

The biological lifestyle factors are physical activity, nutrition, and sleep. The associated variables vitality, body mass index, and health status will also be measured. Cognitive tests will be administered to measure cognitive status. The background variables composition household, educational level, previous GPA, age, sex, ethnicity, mood, job information, computer skills, and study time will be also taken into account. The objective dependent variables are study success, course result, and course duration. As subjective measures, life satisfaction and health related quality of life will be measured.

Six thousand Master students of the Open University (OU) will be approached. Calculated with a resposerate of 33%, which is normal for this kind of research, 2000 participants are expected. All participants will be approached via an official e-mail from the educational office.

Both the survey and cognitive tests will be administered via a website available via the internet to only the invited participants. Therefore, they can participate from there homes or, via any other place were a computer is available. The survey and cognitive tests will be completed within a period of maximum two months after registration as a new student at the OU was successful. Participants receive an invitation e-mail via the educational office in which a link is provided to the survey and information about the research. They can participate at any time they wish. Each time they go back to the survey they can start exactly were they left off before. At the end of the survey they are directed to the cognitive tests. All dependent objective data will be gathered via the exam registration office of the OU.

First, associations between biological lifestyle factors and study success will be analyzed. Second, the association between cognition and study success and third, the association between biological lifestyle factors and vitality, health related quality of life, and life satisfaction will be analyzed. For demographic variables (e.g. sex and age) will be controlled. All these associations will be analyzed with multiple regression analyses, multilevel analyses and eventually structural equation modeling.

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