



**UNIVERSITY OF OSLO**  
FACULTY OF MEDICINE

**Uniwersytet Jagiellonski**  
Instytut Socjologii  
Dr hab Andrzej Bukowski  
Krakow

**Institute of Health and Society**  
PO Box 1130 Blindern  
0318 Oslo  
**Bjorgulf Claussen**

Phone: (+47) 22 85 06 14 / 91 71 86

Telefax: (+47) 22 85 05 90

E-mail: [bjorgulf.claussen@medisin.uio.no](mailto:bjorgulf.claussen@medisin.uio.no)

URL:

<http://www.med.uio.no/nonv/forskning/fagfolk/researcher.php?id=2811&org=185131140>

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**Evaluation of the doctoral thesis of Zuzanna Drożdżak “The influence of vertical intergenerational mobility on health: the analysis of the social mechanism based on Polish population data”**

Heartly thanks for the honour to evaluate a doctoral thesis from the Uniwersytet Jagiellonski, and this chance to study the doctoral work of Zuzanna Drożdżak.

She has asked for the chance to defend the present monograph for the doctoral degree. My conclusion is that the present work fulfill all demands for getting such a degree as far as I can see today, and I advice the University to let her defend her work at a disputation.

The monograph describes her efforts to analyse the influence of vertical social mobility on health. She has also published an article with a literature review in the *Studia Sosjologiczne* in 2015 and two posters at international conferences in the same year.

Some of her hypotheses concern the effects on distribution of health in adult social classes of upward and downward social mobility from the original classes of the parents in childhood. Earlier research from Western societies has found that those moving upwards have better health than their class of origin but worse health than their class of destination, and opposite for those moving downwards. Her most original and novel hypotheses concern a question which is hardly studied before, if the processes of moving have an independent effect on health.

The present thesis is extraordinarily well done, both theoretically and empirically, and is very well written. The candidate goes through a lot of former research, and she presents, in a very good sociological way, many interesting theoretical issues. She criticise former researchers, including myself, quite rightly for using too simple theories and models, and she develops more realistic models for the associations between health and different social positions and mobility trajectories. Her reasons for doing the present work is easy to understand and to applaude, that social determinants of health is the major factor for population health in affluent countries today. In addition, social inequalities in health is unfair. She also discusses briefly what she thinks is the best measures to reduce unfair social inequalites in her country. Friedens pyramid of disease prevention and effective measures is applied very well. She states briefly that psychosocial factors are the main ones explaining these social inequalities in modern societies. That may be discussed in relation to the so-called neo-materialistic theory.

Her main theoretical stand is that the distribution of good and poor health must be explained in a life course perspective. Critical periods in foetal and childhood ages may be important. Accumulation of advantages and disadvantages for health during the entire life course may be important. Most novel is her theoretical and empirical work with the effects on health of the mobility process in itself.

Her empirical work is large. She has used a mixed methods design because “it is problem-driven, rather than technique-driven” (page 41), and I fully agree.

For the quantitative studies she has used the Polish part of the EU\_SILC database twice, first one sample of all  $\geq 16$  years of age ( $n=30,421$ ) in order to make a new sociological classification of occupational status, and second, the main sample of those in ages 45-59 in 2011 ( $n=7,377$ ) to analyse the effects of intergenerational social mobility on two health variables, self-reported general health and chronic illness, both dichotomised.

The first sample was used to make a new and original classification of social positions into three classes, based on economic activity status, occupations according to the commonly used classification ISCO08, education, self-reported household income and supervising duties. These variables were used in a cluster analysis yielding thee clusters, low, middle and high position.

As much as 99.7% got a value after many decisions of how to treat those economically inactive,  
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and all over, these procedures seems to be reasonable. The index was validated by a lot of methods, and showed good properties. I may be tempted to conclude that I find the number in low position of only 33% in 2011 to be too few and 43% middle position and 24% high position too many, while the distribution when the sample was 14 years of age in 1968-76 of 49%, 36% and 14%, respectively, seems to be probable. However, there is no correct answer to such a classification, and all over these procedures seem to give a good index of social position. I think the candidate has done a very valuable job here.

In the quantitative analyses of the main sample, she has used logistic regressions in the statistical programme STATA. She starts by discussing four different equations for these regressions (pages 59-60). Here are large problems with some of the equations, especially because they are not well described. As I manage to understand, equation 1 will give an intercept for health in each of the three mobile groups, upwards mobile people, downwards mobile and stable people, but that is only a part of the aims of the study, and hence this equation is not used. Equation 2 gives among other results the effect of interaction between the upward mobile and the downward mobile groups but needs a intercept term. It will, as the candidate correctly states, give no measure of the effect of mobility in itself, but could have done that, as far as I understand regression methods, if the term  $\beta(\text{cl. of destination})$  was replaced by the mobility term,  $\beta(\Delta)$ . Equation 3 is not described clear enough for me to understand it, and is not chosen either. Equation 4 cannot be used in the present study because it will give complete collinearity ( $\Delta = \text{cl. of destination} - \text{cl. of origin}$ ). This equation is said to be the chosen one, and so is stated on page 88 in the Result chapter, only added intercept and age. It seems to me, however, that these two similar regression equations will not be accepted by STATA, the candidate must have used other equations when getting the crucial Tables 4.7-4.11 and the Figures 4.8-4.9 because these analyses seem to give reasonable results according to the crude results in Tables 4.2-4.4.

Maybe this conclusion is based on my restricted knowledge of regression methods or on me not reading the thesis well enough. Still the thesis must be rewritten here before publication because I am a potential reader of this thesis, and thus it should be possible to understand for me.

The four correspondence analyses are also difficult to understand. In Figure 3.4, the candidate states that the y axis cannot be interpreted, and hence the figures are not understandable. Figures 4.2 and 4.3 are simpler, however, and understandable in spite of lacking defined axes. Figure 3.4 is not very important, it is used in the validation of the occupational index, and it merely gives a visual picture of themes well discussed in the text. But in a revised edition of the thesis all these correspondence analysis figures should be better defined in the headings of the figures.

Results of the quantitative studies were, first, that those having a father with low social position when they were 14 years old, about 48% were in the same position in 2011, while 22% had moved one step up and 10% two steps up (Table 4.1). Also half of those with middle position as children were stable, while 22% had moved one step up and 27% one step down. Nearly half of the children in a upper class position had kept stable, 37% had moved one step down and 15% two steps down. These are relatively high mobility rates, and that corresponds to what the candidate tells us about the tremendously large social and economical changes in Poland after 1989. To put the percentages in the opposite way, 26% of those in the upper class in 2011 came from low class childhood and 40% from middle class childhood, while only 34% had lived a stable upper class life (Figure 4.1).

Current social position is a good predictor of whether the respondents tell that they have a good or poor health, and also whether they report of having a chronic illness or not (Table 4.2). Childhood position also predicts health but is a far poorer predictor than current position. This is interpreted as a support to the mentioned “accumulation hypothesis” saying that health is an effect of accumulation of different positive and negative factors affecting health during adolescence and adulthood, and indicate that the critical period of childhood age are not important for the two measures of health in middle ages of the present population.

An independent effect of mobility was also found, especially as a strong prediction of poor health, stronger than the effect of the class of destination.

However, the candidate does not regard social mobility as a separate life course but rather an extension of the accumulation model. It is stressed that the present results of health effects of mobility is obtained within an accumulation model of regression. Theoretically, we should

regard the social position of an individual as the most important influence of health, and not the change between a childhood and a middle-aged position.

Generalisability seems to be reasonable enough to do for the whole Polish population who moved from the communist context before 1989 into the present day society. But because the present study is the only one to examine these great social changes on a large scale, as far as I know, it is difficult to conclude about generalising to other societies at other times. But I imagine that much of the present results may very well be applicable to other modern societies.

A tremendous strength of the present study is that the candidate takes into consideration the large changes in Poland in the years of the study, her main sample being born in 1952-66, and were 23-37 years of age in 1989. She describes both class structure and typical social mobility in Poland before this change and after, especially around 2011. This mobility was relatively large which is shown by the Gini indices increasing from 0.28 before 1989 to 0.38 in 2000 and then stabilising.

In order to find a more vivid picture of the importance of these Polish contextual conditions for social mobility that the quantitative study could give, but more important, to get a better description of factors that may be of importance for the influences of social mobility on health, she used a mixed model. She has done a qualitative study by interviewing 18 persons, three of each having followed the six possible trajectories of one or two steps upward and downward at the social ladder. She has recruited these 18 persons, also aged 45-69 years, by an online screening survey asking for childhood and present social position and offering 150 Zlotys for answers, giving 65 responses of which 18 participants were selected according to the wished pattern. The candidate interviewed them in their homes, taped the interviews and analysed them according to standard methods in qualitative research.

At the end of the quantitative analyses, the candidate states: "The finding that in the general population the social mobility parameter ... has an independent effect on health, an effect which cannot be reduced to accumulation of exposures over the life course, is the major quantitative finding of this work" (page 101). Especially this result is illustrated by the qualitative study.

The informants had all experienced a far better standard of living after 1989. What seems to surprise the candidate most during the interviews was that this was not often mentioned. What most often was discussed was changes in the social organisation of family life, professionalisation of occupational life, and higher work discipline. Social mobility was not much discussed explicitly. A main result was that people do not always prioritise health in their choices but often have other decisions in mind, like taking care of pride and respect, or reducing humiliation and shame. Grandparents often appeared in the narratives. For instance do some of her impoverished informants want to cultivate their heritage. So in her next study the candidate wants to take them into her research on social inequalities in health. She is heartily welcome.

Sincerely yours

Bjorgulf Claussen  
professor in community medicine