**Clarification of the student’s approach and his/her contribution to the thesis**

**Short, rather humble version**

This study concerned investigating the effect of non-uniform parameterizations on the evolution of small-world networks in coupled logistic maps via adaptive rewiring. It was conducted by MohammadHossein (Manuel) Haqiqatkhah, henceforth student, as his thesis project of master's program in Psychology (Theory and Research track) at the Faculty of Psychology and Educational Sciences, KU Leuven. Over two years, he worked under supervision of Professor Cees van Leeuwen, the head of the Perceptual Dynamic Lab (part of KU Leuven's Experimental Psychology Research Group).

This project was principally a modeling study and was written exclusively in R programming language. All the steps of writing the scripts for modeling, analysis, and reporting, and further adaptation of the codes for parallel computing (and the subsequent execution) on the High-Performance Computing (HPC) clusters of the Flanders Supercomputing Center (VSC) was solely performed by the student. However, on several occasions, the code was debugged with the help of the supervisor, without which the modeling could not have proceeded.

This study was based upon two strands of literature, one in adaptive rewiring and dynamic systems, and the other concerning methodological matters, mainly revolving around graph theory and its applications. The former resources were provided by the supervisor, and the latter was explored by the student. Throughout this project, the student profited from close contact with the supervisor and his valuable feedback. The supervision helped to put what mattered in the spotlight and provided crucial insights into model specification, characterization, and interpretation. The student also benefitted from feedback and insights provided by a post-doc colleague at PDL, Dr. Ilias Rentzeperis, in interpretation of the results.

The dissertation was written by the student and underwent multiple revisions by the supervisor, mostly language and structure of the text. The revisions were thus applied by the student. In line with the values and standards of Open Science, all scripts are available on the project's repository on GitHub (<https://github.com/psyguy/thesis-codes>) and all results can be fully reproduced using the scripts. However, since this study required massive, computationally costly computations to generate models, all model files (500 files amounting to 101 GB of data, produced on HPC clusters) are made publicly available on a repository at the Open Science Framework (<https://osf.io/625d8/>). The OSF repository also includes additional plots and visualizations not included in the manuscript. Please contact the student for additional information on using the online material.

**Long, crappy/braggy version – just ignore it I guess**

This study concerned investigating the effect of non-uniform parameterizations on evolution of small-world networks in coupled logistic maps via adaptive rewiring. The study was conducted by MohammadHossein Manuel Haqiqatkhah, henceforth student, as his thesis project of master's program in Psychology (Theory and Research track) at the Faculty of Psychology and Educational Sciences, KU Leuven. Over the course of two years, he worked under supervision of Professor Cees van Leeuwen at the Perceptual Dynamic Lab (part of KU Leuven's Experimental Psychology Research Group).

~~This master's thesis project started off as computational implementation of adaptive rewiring on large-scale network of coupled neural mass models (CNMMs). In the first phase of the project, after studying the literature, a simple CNMM (with two neural populations) was implemented in Matlab via stochastic differential equations. Soon after trial and error, the intricacy of such model was revealed, especially due to infeasibility of optimization in the vast high-dimensional parameter space. Consequently, we decided to move on to a much simpler model based on coupled logistic maps (CLMs). After this change in direction, …~~

This master's thesis project was essentially a modeling study and was written exclusively in R programming language. The stepping stone of the project was the implementation of the adaptive rewiring algorithm discussed in the literature on a modified version of coupled logistic maps unique to this study. The new implementation, unlike its forerunners, used matrix algebra. Moreover, a state-of-the-art method of network comparison, i.e., NetSimile, was used and the HHG algorithm was utilized in this study to make statistical inference on the degree of network similarities. Using HHG for such task was unprecedented in the literature, and is thus a novelty of this study. Moreover, unique methods were used to draw the final conclusions by aggregating NetSimile and HHG outcomes.

This study investigated multiple conditions and multiple instantiations per condition (50 in total) for a large number of iterations (20 million per model instantiation). For that reason, and due to the emphasis on subgraphs of each network, simulations required complicated handling and organization of model files and required ample computational resources. Consequently, object-oriented programming was utilized and the simulations were run in parallel on the High Performance Computing (HPC) clusters of Flanders Supercomputing Center (VSC). The code required adaptation and optimization before being pushed to the cluster. HPC facilities were also used to produce visualizations and calculate a computationally costly algorithm (i.e., HHG) for 2500 pairs of comparisons. All the computational steps, including programming thousands of lines of code, simulations, and reporting, on both the local machines and the cluster, were solely carried out by the student. However, in several occasions, the code was debugged with the help of the supervisor, without which the modeling could not have proceeded.

This study was based upon two strands of literature, one in adaptive rewiring and dynamic systems, and the other concerning methodological matters, mainly revolving around graph theory. The former resources were provided by the supervisor, and the latter were explored by the student. Over the course of this project in two years, the student profited from the close contact with the supervisor and his valuable feedbacks. The supervision helped putting what mattered in the spotlight and provided crucial insights into model specification, characterization, and interpretation. The student also benefitted from feedback and insights provided by Ilias Rentzeperis in interpreting the results.