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Commentary

Lost – and Found – in Translation

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In 2017, the National Institute on Aging (NIA) with the support of the Foundation for the National Institutes of Health on behalf of the McKnight Brain Research Foundation, held the Cognitive Aging Summit III. This third Summit was focused on cognitive reserve and resilience, highlighting the increasing importance of these concepts towards understanding age- and pathology-related cognitive change. At the same time, the Summit also highlighted important gaps in our shared understanding of how to characterize terms such as *reserve, resilience*, and *maintenance*; moreover, these gaps appeared to result from a lack of clear and consistent definitions of these and related terms. Disagreements over nomenclature and terminology are hardly new in psychology and neuroscience; indeed, the recognition of Jingle/Jangle fallacies in the measurement literature (Kelley, 1927) has long exposed the obstacles to knowledge advancement that these create. Especially clear at the Summit was that differences in usage of key terms had become serious enough to be more than just a nuisance, impeding (among other things) the ability of researchers using human vs. animal models, cross-sectional vs. longitudinal designs, or neuroimaging vs. neuropsychological approaches to appreciate each other's scientific contributions, much less potentially collaborate. In order to know whether and how a lifestyle, a gene or genes, a personality trait, other factors, or all of the aforementioned confer cognitive reserve, brain maintenance, or resilience to neurodegenerative disease, we need common definitions and a universal language.

When we use the same term to refer to different things (the Jingle Fallacy) or different terms to refer to the same thing (the Jangle Fallacy), fundamental knowledge accumulation and progress predictably grind to a halt. Given the gravity of the inconsistencies in the field, the NIA published a funding opportunity announcement (RFA-AG-18-024, "Collaboratory on Research Definitions for Cognitive Reserve and Resilience to Alzheimer's Disease") to drive the development of operational definitions for the constructs of resilience and reserve, as well as related and often used terms such as compensation, brain maintenance, and even resistance.

In 2018, an award was made to support a unique structure to develop uniform, research-based definitions. Designated as the Collaboratory, the award allowed the investigators to use multiple routes to build definitions and consensus by forming working groups and holding workshops, and to enable the cross-validation of proposed definitions and concepts by supporting small pilot projects.

Besides fostering a common language and thus understanding among researchers for these constructs, the framework developed by the team and presented in this issue of *Neurobiology of Aging* will have far-reaching impact. Understanding, treating, and preventing Alzheimer's disease and Alzheimer's disease related dementias is a national priority for the U.S. If we can harness the knowledge of what confers reserve and resilience, treatments could be targeted to mimic these factors and hopefully prevent or slow disease progression.

The paper in this issue describes the thought processes in which the blue-ribbon Executive Committee for the Collaboratory, aided by many experts around the globe, engaged to reach consensus and provide distilled guidance for the scores of researchers hoping to crack the code on how to gain or maintain successful cognitive performance and brain function with age. As the authors note, these definitions may be subject to revision as we gain more knowledge, but it is the generation of operational definitions like

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these in this framework that will help us more clearly communicate.

Uniformity has its benefits - a common language, operational definitions, and a platform from which to propose alternatives. If we aren't speaking the same language, we will be lost in the translation. This effort insures we can find a path forward.

Reference

Kelley, T.L., 1927. Interpretation of educational measurements. World Book Company, Yonkers-on-Hudson, NY.