examined whether 1) MCI patients could independently use MST, 2) MST was more effective than spaced retrieval training (SRT), 3) prefrontally-based cognitive control regions were critical for MST success. **Methods:** Sixty patients with MCI were randomly assigned to MST or SRT. Participants completed five sessions within 2 weeks. During sessions 1 and 5, participants underwent fMRI scanning during both the encoding and retrieval of object location associations. During sessions 2-4, MST participants were taught a 3-step process where they attended to a salient environmental feature, developed a verbally-based reason linking the feature and object, and then created a mental image. The SRT group was matched on number of stimulus exposures and recalled the location of each object after a number of progressive delays of 0-128 seconds. Participants completed a follow-up memory test at 1-month. **Results:** During training, MST patients independently developed cues on over 80% of the trials. Both groups were highly accurate in recalling the location of objects after a single trial and after the final (9th) learning trial (all >90% correct). However, MST patients were significantly more accurate than SRT patients during both the post-training (Cohen’s d=1.03) and 1-month (d=0.83) memory tests. Increased accuracy was inversely related to both the severity of memory impairment and medial temporal lobe atrophy in the MST but not SRT group. The MST group also demonstrated increased activation (post-relative to pre-training) within a number of brain regions, including the PFC. Conclusions: Combined with earlier work, these findings indicate that MST is more effective than spaced retrieval training (SRT), 3) prefrontally-based cognitive control regions were critical for MST success. 1) Does training enhance specialized brain regions or recruit new regions? 2) Is cognitive training restorative (i.e., repairs dysfunctional regions), or compensatory (i.e., recruits intact regions) 3) What brain regions are modified by cognitive training, and do any of these regions form a generic training network? To address these questions we propose an integrative model that accounts for training-induced brain changes in older adults and persons with mild cognitive impairment (MCI). **Methods:** Across a number of studies we compared healthy older adults and persons with MCI using structural and functional brain imaging (fMRI) before and after cognitive training. Training-related functional changes including the level and locus of activity were analyzed as a function of training format (strategic training vs. repeated practice) and type of training (memory vs. attentional training) We also examined whether the regions being modified are those that are impaired in MCI. **Results:** The level and loci of training-related neuroplasticity varied widely as a function of training type. Brain activity increased when training involved learning new strategies to complete a task. For example, using interactive visual imagery in order to learn new words, or learning to modify the deployment of attention while performing a dual-task. In turn, brain activity decreased when repeatedly practicing a familiar activity (for instance, making alphabetical verifications) Furthermore, both intact and dysfunctional brain regions may be modified by cognitive training, provided that the training format was targeted the cognitive processes mediated by those regions. **Conclusions:** The INTERACTIVE model proposes that neurophysiological outcomes are a result of an interaction between training format and individual factors. However, training format is particularly critical in determining the type of training-induced neuroplasticity. The INTERACTIVE model highlights how different training formats impact neurophysiological outcomes, and can therefore be used as a guide when attempting to select a potential program that is most likely to be useful for older adults with MCI.

**F2-01-03**

**COMPUTER-SUPPORTED PERSONAL INTERVENTIONS FOR OLDER PEOPLE WITH COGNITIVE IMPAIRMENT AND DEMENTIA**

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**Background:** Non-pharmacological interventions have important therapeutic potential for cognitive decline. Cognitive training and reminiscence therapy are used widely for this indication, but the evidence remains inconclusive. Technology has a growing relevance in the field of cognition. We thus designed a study using computer-based programs for cognitive training and reminiscence therapy in subjects with cognitive impairment and dementia. **Methods:** We performed a randomized controlled study to evaluate two computerized interventions, namely personalized reminiscence therapy and cognitive training. The reminiscence system was developed specifically for the purpose of this study and the cognitive training system utilized the Sav-ion software program. Participants in adult day-care centers older than 65 years with cognitive impairment or dementia were randomized to either one of the interventions or to a control group, where subjects continued usual activities. Outcome measures included global cognitive function (using the Mindstreams computerized cognitive assessment battery), well-being (using QoL-AD, Will To Live and NPI questionnaires), and caregiver burden (using the short version of Zarit Caregiver Burden Interview). The study received institutional Ethics Committee approval. **Results:** Of the 167 subjects recruited for the study, 95 were suitable for randomization to one of the study arms. Subjects in the intervention groups participated in 2 supervised weekly sessions of 30-minute duration each, for a period of 3 months. Assessments were performed at baseline, at one month (T1) and at 3 months (T3). When comparing the reminiscence group vs. the control group, group effects were found at both T1 and T3 for the following variables: global cognitive score, QoL-AD-patient and WTL. When comparing the cognitive training and the control groups, group effect was found only at T1 for orientation. **Conclusions:** Although this study found promising results for both the computer-based reminiscence and cognitive training interventions, the findings were not adequate to draw firm conclusions. More randomized controlled trials with a greater sample size and longer periods of evaluation should be encouraged.

**F2-01-04**

**INTERACTIVE: A MODEL TO ACCOUNT FOR TRAINING-INDUCED NEUROPLASTICITY IN OLDER ADULTS AND PERSONS WITH MILD COGNITIVE IMPAIRMENT**

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**Background:** There is increasing evidence that cognitive training can benefit older adults. Nonetheless, a number of important questions remain unanswered regarding the neural impact of cognitive training for older adults: 1) Does training enhance specialized brain regions or recruit new regions? 2) Is cognitive training restorative (i.e., repairs dysfunctional regions), or compensatory (i.e., recruits intact regions) 3) What brain regions are modified by cognitive training, and do any of these regions form a generic training network? To address these questions we propose an integrative model that accounts for training-induced brain changes in older adults and persons with mild cognitive impairment (MCI). **Methods:** Across a number of studies we compared healthy older adults and persons with MCI using structural and functional brain imaging (fMRI) before and after cognitive training. Training-related functional changes including the level and locus of activity were analyzed as a function of training format (strategic training vs. repeated practice) and type of training (memory vs. attentional training) We also examined whether the regions being modified are those that are impaired in MCI. **Results:** The level and loci of training-related neuroplasticity varied widely as a function of training type. Brain activity increased when training involved learning new strategies to complete a task. For example, using interactive visual imagery in order to learn new words, or learning to modify the deployment of attention while performing a dual-task. In turn, brain activity decreased when repeatedly practicing a familiar activity (for instance, making alphabetical verifications) Furthermore, both intact and dysfunctional brain regions may be modified by cognitive training, provided that the training format was targeted the cognitive processes mediated by those regions. **Conclusions:** The INTERACTIVE model proposes that neurophysiological outcomes are a result of an interaction between training format and individual factors. However, training format is particularly critical in determining the type of training-induced neuroplasticity. The INTERACTIVE model highlights how different training formats impact neurophysiological outcomes, and can therefore be used as a guide when attempting to select a potential program that is most likely to be useful for older adults with MCI.