

## **Train Your Brain!**

### **Social Dance and Neurology**

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Medical achievements and an increased balanced lifestyle have resulted in a higher life expectancy. In the coming 10-15 years, the share of people above the age of 60 will increase from 24% to 37% of the total population of Austria. Besides enjoying a longer life, we (i.e. the society as a whole, but mainly everyone individually) have to seize the opportunity of a longer life and prepare ourselves for getting older. We have to protect our health and our physical fitness, from illnesses, like stroke for example, that are more likely to occur at a higher age. At the same time, we should not forget our cognitive health and fitness. It doesn't help to be 'fit as a fiddle' or as the German translation says, 'fit as a gym shoe', if you no longer know what a fiddle or a gym shoe is. Lifelong education therefore is not an empty phrase but the key to the amount of our cognitive reserves. If we don't constantly train our brain performance, our brain will degenerate and there is nothing we can do to counteract the ageing process. Taking into account the above-mentioned increased ratio of people above the age of 60 in the total population, it should be mentioned that up to 20% of those above the age of 65 already suffer from mild cognitive deterioration (*Gauthier et al 2006*). Those cognitive reserves can be understood as an 'airbag' of our brain and its activities to have the biggest possible capacity to regenerate in case of brain and brain-related diseases.

There are many methods to stay mentally fit; there are no limits to individual interests. This is driven by the curiosity towards new things; it is reinforced by social integration to exchange with other people, including those with dissenting opinions. There is an especially complex, but rewarding way to train brain performance, regardless of age: Learning and hopefully enjoying the practice of social dancing. Why? We have to activate our brain and make use of almost our entire cognitive network while dancing. In the case of social dancing, it is the combination of cognition, power, coordination, stamina and social interaction:

- Sensory perception: visually, auditive, haptic, vestibular, position, movement
- Judgement of perception(s), including memory, approach, values, desires, self-image, social context
- Matching of existing feelings
- Incentives for action
- Comparison with alternative actions, selection and decisions, including balancing them towards feelings of anxiety or disgrace
- Performing an action
- Activating the skills to stay in balance, using and adapting the body tone to step patterns and rhythm

- (social, motoric, haptic, mimic, ...) adjustment to match the dance partner and the group
- Planning of the next (dance) steps and figures
- Evaluation of the action including the comparison with others
- If necessary, adjustments and/or correction
- 'Programming' and 'automatization' of studied items
- Emotional processing, like increased motivation, joy
- Expanding already learnt things to more complex action
- And a lot more

While dancing, we are truly “multi-tasking”. We dedicate ourselves to various activities and actions at the same time in order to bring them together as a “performance”.

In general, those cycles which are activated in our cognitive network through dancing, are assumptions based on the demands and the effects of dancing. Scientific evidence is currently scarce and should be deepened and expanded. But there are some hints that can be taken from smaller studies: Dancing can stimulate neuronal plasticity in pre-motoric areas (*Karpati et al 2015*) of professional dancers (*Bar RJ and Souza JFX 2016*) and seniors (*Rehfeld et al 2017*). Tango dancers, for example, show increased cortical activities in pre-motoric and motoric supplementary brain areas (*Sacco et al 2006*). It has already long been known that rhythmic auditory stimulations (through music with different beat frequencies) have an influence on the walking and running speed, in particular areas of the brain (thalamus and cerebellum) (*Thaut MH 2005, Thaut CP und Rice RR 2014*). Social dancing has a proven positive influence on cognitive abilities (*Kattenstroth et al Front Aging Neurosci 2010*), mental flexibility (*Coubard et al 2011*) and the whole range of the cognitive reserves (*Porat et al Dement Geriatr Cogn Disord 2016*). Of course, there is a big difference in the expected cognitive activation through social dancing, if it is learnt and practiced only once a year or in a systematic and continuous manner, for example once or twice week over a longer period of time (*Fletcher et al 1996*).

To sum up, there are various, very good reasons from a neurological point of view to: “Train your Brain”! Social dancing in particular, no matter of the age, seems to contribute to both physical and mental health and therefore helps increase our living quality. Isn't that the aim of our life?

Selected Literature:

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