



OBLIGATORY EXECUTIVE FUNCTION FOR ALL LEARNERS – INHIBITORY CONTROL

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ABSTRACT

Executive functions are the higher order cognitive skills required by the individuals, especially for a successful life. The core aspect of executive function is the inhibitory control, an essential commodity which cultivates the virtues within the younger generation. It is liable for a better academic achievement and a sustainable normal behaviour in the classroom and in any societal environment. This paper aims to enlighten the facts about inhibitory control, its significance and the neuroscience bases of it. These demonstrate the techniques adopted to do betterment for the well being of individuals from their school life itself.

KEYWORDS: executive function, inhibitory control, neuroscience, cognitive skills .

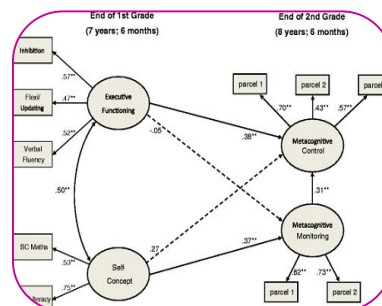
INTRODUCTION:

An elite person has the mental ability to consider another person’s perspective thus keeping down their own perspective to complete an action purposefully. Human beings are known for their best quality of maintaining self control and that is how they are defined exactly. Self control is needed for sure to achieve a variety of life outcomes. Interestingly, individual differences in inhibitory control abilities are due to the various social emotional outcomes. Significant differences emerge with respect to age and gender. Individual differences in effortful control, although, due partly to heredity are also associated with the quality of mother-related interactions (Eisenberg, 2012). Inhibitory control is responsible for the quality of children’s social interactions and their learning capacity. This factor is a predictor of adaptive development across domains. This requisite ability inhibitory control dynamically modifies or cancels the planned actions according to the surroundings and is considered as a fundamental component of flexible cognitive control (Nigg, 2000).

EXECUTIVE FUNCTION

Executive Function refers to a set of top-down processes that allow regulating one’s thoughts and behaviours (Miyake & Friedman, 2012). The abilities that refer to these processes are inhibitory control, planning, cognitive flexibility and working memory. Interference control, cognitive and behavioural inhibition represents a set of abilities related to executive functions defined by Nigg (2000) as executive inhibition. These are experienced in some situations based on a fast cognition and behavioural adjustment of novel or shifting requests of environment.

Executive function skills are important for school readiness and furthermore their personality development. In particular, inhibitory control independently predicts both math and reading competence



throughout the school years (Duckworth & Seligman, 2005). Improving young children's executive function skills will improve their long term acquisition of academic skills and also life skills. Those abilities can be improved even in preschoolers. This can be done in regular classrooms with regular teachers without special equipment. Executive function skills are to be made superior for a better life.

INHIBITORY CONTROL AND SELF REGULATION

Self regulation is a broad term that includes self control, will power, effortful control, delay of gratification, emotion regulation, inhibitory control and overlapping constructs with their own specific definition and measures. Inhibitory control together with other cognitive control functions is deeply entangled with other cognitive processes (Badre & Wagner, 2004). The paradox underscores the importance of research investigating inhibitory components of self regulation (Rothbart et al., 2011) as predictors of healthy child development across domains.

There is much overlap among executive functions especially its inhibitory component and self regulation. Historically executive function researchers have focused most on cognition at times using objective, behavioural measures. Here, emotion is seen as something to be controlled. The self regulation researchers have emphasised more the social situations, often with strong motivational components. They argue that the emotions need expression as well as they can be controlled. So executive functions are the requisites, whenever going on automatic would not suffice or would be detrimental such as when learning new or challenging material in a noisy or distracting environment or there are strong temptations to be undisciplined.

INHIBITORY CONTROL

Inhibition or inhibitory control is the ability to inhibit or control impulsive responses and creates pleasant and useful responses by using attention and reasoning. It contributes to anticipation, proper planning and goal setting as per the capabilities of oneself. It may be defined as 'A deliberate overriding of a dominant or pre-potent response (Miyake & Friedman, 2012) eventhough inhibition is a multidimensional construct by itself and comprehends many difficult abilities such as managing impulses and interferences, both behavioural and cognitive (Diamond, 2013). Barkley (1997) mentioned that inhibitory control is comprised of three inter related processes namely inhibition of a pre-potent or dominant response, stopping of an ongoing response and interference control. Behavioural regulation enables goal-oriented behaviour, by overcoming all the unwanted and competing desires, emotions or impulses interfering with the goal achievement. Switching to a more appropriate new goal is another important aspect of behaviour regulation.

INHIBITORY CONTROL AND NEUROSCIENCE

Prefrontal cortex, an area of the brain, is relatively immature during childhood with development thought to be a protracted process that continues at least until early adolescence (Anderson, 1998). Prior behavioural studies showed that adolescents differ from adults in these inhibitory control abilities (Luna, Garver, Urban & Sweeney, 2004). As shown by prior research (Gogtay et al., 2004), myelination and gray matter pruning processes are still ongoing during adolescence and early adulthood in prefrontal regions that are often engaged in tasks require a certain level of this regulation (Badre & Wagner, 2004). Parietal areas also appear to be relevant for the very same skills in adults (Garavan, Ross & Stein, 1999) apparently by supporting attentional processes that enable the implementation of this expertise (Corbetta & Shulman, 2002).

Higher-order association areas in the prefrontal and temporal regions supporting cognitive control and social cognition show prolonged changes in cortical thickness and grey matter volumes until early adulthood (Mills, Goddings, Clasen, Giedd & Blakemore, 2014). The frontal structures of the brain are the last ones to mature during development, that's the reason of some kind of maladjustments in some young children and they have trouble in managing the unexpected changes or events. Structural and functional

changes particularly in the dopamine brain pathways that occur during this adolescent age period are believed to play a key etiological role (Steinberg, 2010).

PROMINENCE/SIGNIFICANCE OF INHIBITORY CONTROL

Inhibitory control is one of the most used cognitive functions for a thriving future and the enchanting fact is that the brain corrects the behaviours usually. It is crucial as it helps us to be calm and react as usual irrespective of the difficult and different situations. A successful student will be able to inhibit the disturbing and distracting actions, react to unforeseen or risky situations safely and quickly and therefore will likely to perform better academically at work, on the road and with friends. Handling distractions and unexpected changes depend directly on inhibition. This is why inhibitory control should be assessed in a variety of different environments. Due to this complexity, inhibition lately has been theorised as ability that more than being a dimension per se may be a general factor executive control that may also influence all the other abilities (Miyake & Friedman, 2012). Rhoades, Greenberg and Domitrovich, 2009 found that young children with greater inhibiting capabilities had higher social skills and lower internalising behaviours which include symptoms of anxiety and depression.

The superficial ability has an important control and filter role that involve being able to manage thoughts, actions and in general, interferences. It allows us to keep the attention focussed, to suppress the override of a pre-potent response or as usually, automatic action in case of need or danger. Inhibitory control implies the ability to regulate behaviour and emotions, without this kind of control, we would be at the mercy of impulses and in constant danger of taking bad decision or to not be able to manage complex situations. It is very imperative as it prevents our mental space to be overwhelmed by information, resisting to proactive interference and deleting no longer relevant facts or materials (Zacks & Hasher, 2006). Cognitive inhibition is a chief attribute in supporting the working memory which selects carefully only the relevant information in order to let the goal guide our behaviour decreasing the probability of being driven by an automatic response that could imply a failure in pursuing the goal.

Inhibitory control is a determinant of cognitive and socio emotional development (Borst, Aite & Houde, 2015). Children with better developed inhibitory abilities are more likely to comply with explicitly stated rules in unsupervised situations and to behave in socially competent ways at school. Development of complex skills such as arithmetic, reasoning, and theory of mind, decision making, and creativity rely on increasingly efficient cognitive control processes.

INHIBITORY CONTROL AND DEVELOPMENTAL STAGES

Individuals continue to improve their abilities to regulate their own emotions and behaviours throughout childhood, adolescence and even adulthood (Kopp, 1982). Indeed inhibitory control abilities in childhood predict later academic and professional success and social adjustment (Diamond, 2013). Children are already capable of performing response inhibition tasks but these tasks are not mastered until adolescence (Luna, Garver, Urban & Sweeney, 2004). Inhibitory control is associated with multiple indicators of well being from middle childhood into adolescence. Adolescents represent a critical period for brain development. Two decades of cognitive neuroscience research suggest that adolescence is associated with increased use of top down cognitive control skills, which allows adolescence to focus their attention and regulate their emotions and behaviour in order to achieve their goals (Crone & Dahl, 2012).

Adolescence is defined as the transition period between childhood and adulthood (Crone & Dahl, 2012). It is characterized by hormonal, physiological and physical changes as well as changes in social roles and responsibilities. In adolescence, these knacks are the core dimensions of inhibition because scaffold is the ability to assist staying focussed and not to get distracted by irrelevant information. Inhibitory control skills may play a role in adolescents' ability to resist an impulsive risky choice or instead behaviour may be mainly driven by increased sensation or reward-seeking (Steinberg, 2008). Adolescents engage in more risk taking than children or adults (Albert, Chein & Steinberg, 2013). Adolescents often fail to maintain a

behavioural standard or pledge to work towards a desired outcome, most commonly because of the presence of temptations or more attractive, alternative short term goals (Web & Sheeran, 2006).

BOOSTING UP THE INHIBITORY CONTROL

Like other cognitive skills, inhibition can be learned, trained and improved. Frequent exercise will be assistance for such an inhibition, the brain connections and its structure will become stronger as well. Like muscles, the brain and its connections need to be used and challenged in order to get stronger and work better. Neuroplasticity is one way of rehabilitating and improving inhibition and other cognitive skills. A consistent and challenging cognitive stimulation is the best way to improve inhibition. There are a number of interactive games and activities to play on a computer, tablet or mobile phone.

Motivation and encouragements do some drastic changes within the students in raising their behavioural regulation. Parenting has also been a sector pinpointing its importance in the well growth of a child. In general, young children's self-regulation has been positively associated with maternal support and sensitivity and negatively related to a directive and controlling care giving style (Eisenberg, 2012).

EDUCATIONAL IMPLICATIONS

Proactive school-based preventive program aimed at reducing behavioural problems, promoting socio emotional competence will surpass the inhibition characteristics of children. Because of the relation between the inhibitory control and healthy psychological and socio-emotional development, service providers and policymakers are well advised to implement procedures in the curriculum adopted paving the real way for a supportive parenting and teacher-child interactions. Taken together, educational and psychological arena clearly depict that this unique dimension of cognition is required for the multiple aspects of well-being. Sure it is a malleable construct with widespread improving strategies.

CONCLUSION

By providing the novel experiences to the students, inhibitory control is to be improved a lot. Not only the school atmosphere but also the home must be a pleasant place with good care and beloved parenting features. Teachers and parents must discuss about the wards in recognising them and their skills. As a result, any problematic issues can be handled smoothly. Also, the interventions may be done to energise the cognitive control processes whirling them to reach the heights in their life. Still the inhibitory control is an ongoing developing task for a few. Bureaucratic persons do some changes every now and then to promote the pupils' self regulatory attributes by way of curriculum and the school associated activities.

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