A validity study of the potential for a specific game environment for training emotion regulation
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The EU project xDELIA (Xcellence in Decision-making through Enhanced Learning in Immersive Applications, www.xdelia.org) seeks to enhance the quality of investment decisions made by private investors. Investors' financial capabilities are believed to be correlated with their skills in managing their emotions; less skilful investors are more prone to emotional biases in decision-making, such as the disposition effect, i.e. selling stocks that have risen in value fast and holding on to losing stocks yielding a net loss (Shefrin & Statmanand, 1985), and hyperbolic discounting, i.e. valuing present wins over than delayed wins, even if the latter are bigger (Harris & Laibson, 2001).

The work presented here aims to validate a training game prototype that could later be used as a learning platform for training in emotion regulation by the investor group. Emotion regulation can occur in many ways, the two methods addressed in our current work concern emotional suppression (henceforth suppression) and cognitive reappraisal (henceforth reappraisal). Suppression is defined as “inhibiting ongoing emotion-expressive behavior“ and reappraisal is “construing a potentially emotion-eliciting situation in nonemotional terms“ (Gross, 1998). Reappraisal is commonly thought to be more effective and to have positive effects on wellbeing since it acts before the emotional response is elicited, while suppression acts after the emotional response is elicited and is associated with negative effect on wellbeing, impaired memory and is generally less effective than reappraisal (Gross, 2003). Also, reappraisal appears to put less strain on cognitive resources, making them available for other task, thus improving task performance (Wallace et al., 2009).

Gameplay may be defined as goal-directed and competitive activity conducted within a framework of agreed rules (based upon Lindley, 2004). Serious games are games that are created or played for a specific purpose other than mere entertainment. The field of serious games has long sought a way to blend fun and education in order to improve learning. Such approaches have been taken by, e.g., Malone (1980) and Garris et al. (2002). Other approaches, such as simulation training, base the gameplay in a simulation environment. Pierfy (1977) did a meta-analysis of 22 studies where learning was better in three cases with games instead of conventional teaching, worse in three cases, and it did not make any difference in the remaining cases. Biofeedback has been shown to help with learning to influence blood pressure (Glasgow et al., 1982), pain (deCharms, 2008), and self-reported emotional responses (Allen et al., 2001).

Because of these successes with biofeedback, we have created a two-dimensional shooting game, named the Aiming Game (Cederholm et al., 2011), that utilizes biofeedback for training in emotion regulation. The biofeedback device used was the Emotiv EPOC™ (www.emotiv.com), a commercial EEG headset created for gaming applications. The goal of the Aiming Game is to acquire as many points as possible, which is achieved through shooting down black airplanes. There are also pink airplanes that act as distractors and that will cost the points if they are shot down. Every shot has a cost as well, so it is important for players to not waste shots. During play, the player's instantaneous
excitement is recorded using data from the EPOC™. This data is fed back into the game and used as a measure of player excitement, divided into five intensities. Before each game level the player is informed what intensity of excitement he or should aim for. The further away from the goal intensity they are, the harder the game gets, by manipulating two factors: the screen becomes increasingly blurry; and an aiming offset occurs, randomly misplacing the aiming crosshair every 0.5 seconds away from the mouse position. The misplacing radius grows bigger the further away from the goal excitement intensity the player is, encouraging the player to handle their emotions well in order to regulate their level of excitement.

We have tested out the game with groups instructed to use methods of suppression, reappraisal and control (i.e. no instructions on how to handle emotions). These results indicated that subjects’ tendencies toward emotion regulation strategies are correlated with game performance and will be described in detail later on.

References