

Emotion Regulation in Enhancing Adolescents' Academic Performance

Yuliana^{a, 1}

^a Faculty of Medical Sciences, Universitas Udayana, Indonesia

¹ lee.yuliana@gmail.com

Abstract

Adolescence is a transition period between children and adult. There are many changes in physical, sexual, cognitive, and emotion. Aside from coping with those changes, they have to handle their academic performance very well. In order to tackle with those challenges, they need a lot of support from parents, teachers, and peers to prevent maladaptive adolescent behavior and psychopathology. Brain involvement in emotion and learning are amygdala, hippocampus, prefrontal cortex, limbic system, and insula. Emotion regulation is very important in enhancing adolescent academic performance. Emotional competence is the key for success in life.

Keywords:

Emotion; Academic; Performance; Regulation; Enhancing; Adolescence



This is an open access article under the CC-BY-NC license.

INTRODUCTION

Students have increased pressure from their parents to achieve success in academic nowadays, include adolescence students. However, adolescence students also face emotional upheaval, tremendous changes in biological and psychological well being. They are at risk of depression and panic due to numerous adolescence and school challenges. Adolescence students are not merely learners but they have special need in emotion regulation to enhance academic performance (Crede et al., 2015).

Adolescence students usually are more likely to understand and retain information when they are involved emotionally in learning process. One of the ways is by role playing. Through role playing, teachers are able to make the students feel safe while maintain emotionally challenging teaching way. Strong emotion (positive or negative) is usually better than neutral emotion in learning (Heyward, 2010).

Emotion regulation is intended to influence the duration, intensity, and type of emotion. Once emotion is well regulated, then social functioning, physical

and psychological well-being, also academic performance can be stabilized. Adolescence is a transition between childhood and adulthood (12-18 years old). There will be fast and fundamental changes in biology, emotional, and cognitive domains (Theurel & Gentaz, 2018). Psychopathology during adolescence tends to be more severe and lasting longer than adult onset (Fairchild, 2011). Adolescents had intense emotion fluctuation. They are vulnerable to depression if this transition phase is not well managed. Thus, emotion regulation is very important in this phase (Theurel & Gentaz, 2018).

Adolescents have a growing need for independence, academic and fluctuating social relationships. These challenges are often accompanied by increased emotional reactivity and stress. Development of cognitive processes include development of prefrontal cortex and the remodelling of connections between prefrontal and limbic regions. Adolescents are learning to negotiate in these neurocognitive processes. Adolescent emotional processing and regulation development might follow non-linear trajectory. Good emotion regulation in adolescence will have long-term consequences for future

regulatory success and mental health (Ahmed et al., 2015).

Adolescents face big changes in social, emotional, physical, and relationships. Conflicts are likely to peak in early adolescence and these are the processes to form mature adult. Managing conflict will help adolescent going through unpredictable strong feelings and intense emotions. This happen because their brain is still learning how to control and express emotions in a grown-up way (Heller & Casey, 2016).

Adolescents might feel self-conscious about their physical appearance. They might compare her body with friends and peers. Strong relationships with family and friends are vital for social and emotional development. Parents can be adolescence role model for positive relationships with friends, children, partner and colleagues. Adolescents will learn respect, empathy and positive ways of resolving conflict. Dealing with difficult emotions and moods is important emotional competence (Heller & Casey, 2016).

THEORETICAL PERSPECTIVES

Emotion

Emotion has an obvious influence on the cognitive process, including learning,

memory, perception, attention, and problem solving. Emotion has tight linked to learning processes. Emotion also helps recall of information efficiently. However, emotion could enhance or impair learning and long-term memory (LTM) retention, depending on a range of factors (Tyng et al., 2017).

Emotional experiences are numerous in academic settings. There are tests, homework, and deadlines. Those experiences are associated with frustration, anxiety, and boredom. Emotional stimuli consume more energy and attention than non emotional stimuli. Nevertheless, emotional stimuli will retain more information than non emotional one (Tyng et al., 2017).

Human emotions consist of complex interactions between subjective feelings as well as physiological and behavioral responses that are triggered by external stimuli. These emotions are subjectively perceived as "personally significant". There are some similar terms related to emotions such as moods, feelings, affects, and drives. Moods last longer than emotions. Moods can be negative or positive. Feelings are good or bad mental experiences accompanied by internal physiological

changes in the body, such as heart, lungs, and gut. In psychological term, emotion includes affective, behavioral, cognitive, expressive and physiological changes. Emotion is triggered by external stimuli. It is combination of feeling and motivation (Damasio & Carvalho, 2013).

Changes in emotional states can be monitored through three approaches such as subjective approaches, behavioral investigations, and objective approaches. Subjective approaches are related to subjective feelings and experiences. Behavioral investigations consists of facial expression, vocal expression, and gestural changes. Objective approaches include heart rate, respiratory rate, skin temperature, and blood volume pulses (Jack & Schyns, 2015).

Emotions are responses to environmental stimuli at multiple levels. The levels are subjective level (affect), physiological level (stress responses via the peripheral nervous system), and regulatory level (success in emotional experiences). Adolescents experience intense emotional responses. Stressors result stronger negative affect among adolescents than children. There is stronger associations between stressful events and negative

affect in adolescents (McLaughlin et al., 2015).

Adolescents spend less time with their parents and more time with peers. They start to decide something independently on a very limited experience base. Independence and inexperience can alter consequences for their education. Adolescents have dramatic changes in physical state such as growth spurts and pubertal hormonal surges. They also have changes in sleep patterns. Challenges are quite tremendous because they have to understand and manage their physical, relationships, and responsibilities changes (McLaughlin et al., 2015).

Emotional reactivity involves physiological responses such as activation of the sympathetic division of the Autonomic Nervous System (ANS) and the Hypothalamic Pituitary Adrenal (HPA) axis. Adolescents have amplified physiological reactivity to social evaluation and to performance related stressors as compared with children. Heightened physiological reactivity such as pupil dilatation is observed in response to social rejection among adolescents. Adolescents have greater sense of embarrassment than children and adults. However, these responses are not consistent. Response is

depend on self-relevant social information (McLaughlin et al., 2015).

Stressors are potent risk factors for many forms of psychopathology. Perceptions of stress increase during adolescence. Higher levels of conflict with parents and peers are dominating. Each of these emotional antecedents has increased the risk for psychopathology. Elevations in physiological reactivity and greater emotional lability also contribute to psychopathology risk in adolescence. Frequent interpersonal stressors are associated with disruptions in adolescents' ability to regulate their emotions. Negative emotion are anxiety, depression, aggressive behavior, substance use problems, and eating over (McLaughlin et al., 2015).

Emotional Regulation

Emotional regulation is intended to influence the duration, intensity, and type of emotion. It also include the monitoring, evaluation and modifying of emotional reactions in order to accomplish goals. The process can be implicit and explicit. Implicit means processes occur automatically and mostly outside awareness. It usually occur at very early stages of the emotion regulation process. Explicit emotion

regulation means using conscious strategies to modify emotional responses. Emotional fluctuations ceased by late adolescence (18 years of age) (Ahmed et al., 2015).

Fully emotion regulation requires the ability to recognize the emotional significance of perceived stimuli, to select and implement an appropriate strategy. Finally, it requires the coordination of executive functions and social cognitive skills (Sheppes et al., 2015). Once emotion is well regulated, then social functioning, physical and psychological well-being, also academic performance can be stabilized. Adolescence is a transition between childhood and adulthood (12-18 years old). There will be fast and fundamental changes in biology, emotional, and cognitive domains. Adolescence is vulnerable to depression if this transition phase is not well managed (Theurel & Gentaz, 2018).

Emotions are regulated at behavioural and neural levels brain regions. It involved limbic system and prefrontal cortex. Adolescence is a time of poor emotion regulation, including depression, anxiety and antisocial behaviour. Manage development of emotion regulation is a preventative target for psychopathology (Ahmed et al., 2015).

Adolescents have improvements in emotion regulation abilities in their late phase of adolescence. Upgrading in cognitive control efficiency enhance ability to regulate emotions, particularly through cognitive reappraisal. Cognitive reappraisal is an emotion regulation to alter the meaning of an emotional cue through cognitive reinterpretation. Adolescents have reappraisal strategies better than children. In addition, adolescents are more likely to ruminate in response to stress relative to children (McLaughlin et al., 2015).

One of the emotion regulation method is distraction and appraisal. Social learning is important in reactions to emotion. Adolescent students raised in compassionate environments, are able to effectively manage emotions. Secure feelings increased empathy and inhibit distress. They found an inverse relationship between self-reports of attachment anxiety and avoidance related to empathy. Moreover, attachment anxiety was positively related to personal distress (Veale et al., 2015). Poor emotion regulation skills increased negative attitudes. Emotion regulation skills is important in the development of self-compassion. Anxiety and fear are related

to difficulties in emotion regulation. Poor emotion regulation skills increased negative emotion (Farnsworth et al., 2016).

Adolescents have unpredictable temper. It makes adolescents more vulnerable to developing risk for psychopathology. One of good emotional strategy is corumination. It is excessive discussion of personal problems with friends. It will increase friendship quality. Establishing autonomy from parents, independent self-exploration, learning, and forming close relationships with peers are advantages of emotional regulation in adolescents. Emotional life of adolescents can't be prevented and it is the important final stage of psychological and neurobiological development (McLaughlin et al., 2015).

Role of Parents

Parents need to know their children's friends and welcome them. It will have good effects on children's social relationship. This means the children's sense of self will increase. Active listening can be a powerful way of strengthening parents and children relationship. Listening actively means the parents stop what they're doing when children want to talk. Parents have to

respect children's feelings and try to understand their perspective, even if it's not the same. Telling honestly the parents' feelings are also good ways to help children responds to emotion well (Borghuis et al., 2017).

Discussing about relationships and sexuality in an open and non-judgmental way will prevent adolescents from sexual abuse. In addition, it will promote trust and build relationship between parents and adolescents. It's often good to find out what children already know. Discussion gives parents good chance to correct any misinformation and give the facts about appropriate sexual behaviour. It is important to let adolescent know that parents are always provide time to be their best friend in discussing any questions or concerns (Goddings et al., 2012).

Reinforce the positive aspects of child's social and emotional development by praising children will strengthen bonding between adolescents and their parents. Doing sport together is one way of enjoying the adolescence period. Parents should keep on feeling positive about their adolescent children (Drury & Giedd, 2009). Any emotional psychopathology of early adolescents may influence ongoing emotion regulation skills

and emotional well being (Davenport et al., 2011).

Role of Teacher

Given its broad influence, teacher emotional support can be a target of intervention. Emotionally-supportive teacher in the beginning of the school year will increase adolescents' academic behavioral engagement and mastery motivation. Emotionally-supportive classrooms will give appropriate opportunities to exercise autonomy for adolescents in their day-to-day activities. These will attract more positive relationships with their peers (Ruzek et al., 2016).

Positive connections among companions in the homeroom can be advanced by instructors. These will expand positive friend connections. Instructor's comprehension of youngsters' passionate skills is a basic piece of a triumph well-working study hall. This circumstance will make a viable learning condition for understudies (Piotrowski et al., 2015). There are changes of social collaboration and physical advancement in early pre-adult. Understanding about youthful understudies' enthusiastic wellbeing is

critical amid this period (ages 9-13 years) (Ellis & Zarbatany, 2017).

Passionate skills involve enthusiastic understanding and enthusiastic insight (Keefer, 2015). Enthusiastic Intelligence is identified with comprehend and overseeing of one's feelings, and view of feelings (Poulou, 2016). Hypothesis of Brain (ToM) is the capacity to get feelings, wants and convictions, and after that utilizing this capacity to foresee one's self as well as other people's practices (Valle et al., 2015). Such aptitudes are generally present amid center youth. They will most likely translate social standards and respond to their own and other individuals' enthusiastic setting (Kuhnert et al., 2016).

Friend communications offer opportunity to rehearse relational arrangement abilities (Lam et al., 2012). Compassion assumes a job in self-recognitions. Past investigations have demonstrated that young men principally associate in bigger same-sex peer bunches that emphasis on competitiveness (Rose & Asher, 2017). Young ladies are typically close with more modest number of gatherings (Kuhnert et al., 2016). Sympathy is expanded in young ladies around thirteen years of age (Lam et al., 2012). Young men had an impermanent

increment in compassion, anyway a decrease in sympathy occurs by the age of 13 years (Lam et al., 2012).

Measurement of Emotional Competencies

The Interpersonal Reactivity Index (IRI) is the most widely used assessment of self-report children's emotional competencies. It is a scale used to measure empathy. In addition to adolescents' self-reports, it is important to get reports from teachers and parents to gain an accurate picture of adolescents' social and emotional skills (Keefer, 2015).

Interpersonal reactivity index is divided into four subscale description, i.e. perspective talking, fantasy, empathetic concern, and personal distress. Perspective talking is ability to understand other people's point of view. Fantasy is ability to put oneself in the fiction's characters. Empathetic concern is able to feel empathy for others. Personal distress is negative feelings as reaction to other's emotion (Keefer, 2015).

There is discrepancy between how teachers and students view their emotional competencies. Empathy and compassion are emotional understanding needed to be developed for students. Teachers should encourage students to share and integrate

mental state talk every day by being role models. Teachers could encourage male students to share about their feelings about their friendships or sports competition. Those life skills are essential for early adolescents of all gender orientations and need to be main focus of high school social-emotional skill (Smith et al., 2019).

Brain

There are some important areas in brain for remembering such as amygdala, hippocampus, medial temporal lobe, and prefrontal cortex (Heyward, 2010). Amygdala modulates memory consolidation. Prefrontal cortex mediates memory encoding and formation. Hippocampus is important for learning and long term memory retention. Understanding of emotional influences on learning and memory processes may be useful for the design of effective educational strategy to enhance adolescence academic performance (Tyng et al., 2017).

The prefrontal cortex is important in the generation and maintenance of emotion regulation strategies. Subdivisions of the prefrontal cortex is dorsolateral (dlPFC), ventrolateral (vlPFC) and

ventromedial regions (vmPFC). Prefrontal cortex is protracted. There are reductions in cortical grey matter volume, density and thickness continuing into adolescence and even into the third decade of life. It might be related to elimination of redundant synapses. Synaptic density gradually increases during childhood. It peaks in early adolescence, and finally it reduces by 40% during adolescence. It shows an inverted-U shaped pattern. Synaptic pruning in adolescence might turn remain connections into specialized functional networks and it might increase efficient cognitive processing (Ahmed et al., 2015).

Emotional feelings require anterior insular cortex the central nervous system as integrative role. Emotional operating systems consist of caudal and medial subcortical brain regions. These regions generate emotional experiences via localized electrical stimulation of the brain stimulation (Damasio & Carvalho, 2013).

Ventral striatum activates in response to learning, emotional and motivational aspects of behavior, also processing and anticipation of reward. Ventral striatum has significant anatomical and functional connectivity with the medial frontal cortex. It is also connected with other limbic frontocortical structures such as amygdala,

hippocampus, midline thalamus, insula and perigenual anterior cingulate cortex (Bjork et al., 2011).

Amygdala is important in detecting emotion. It is a structure in the medial temporal lobe. Amygdala is connected to prefrontal brain region. There are exaggerated reactivity patterns in adolescents compared with children. Prefrontal cortex has a central role in the effortful emotion (include fear response). It could constrain the efficiency of emotion regulation. Dynamic neurodevelopmental changes in emotion processing circuitry might contribute to the intensity of emotions during adolescence (McLaughlin et al., 2015).

Role of Emotion in Learning and Memory

The impact of emotion on learning processes is well established. Some studies report that positive emotions facilitate learning and improve academic achievement. It might be mediated by self-motivation and satisfaction with learning materials (Um et al., 2012). However, a recent study reported that negative learning-centered state (confusion) facilitate learning due to increased focus of attention on learning material (D'Mello et al., 2014).

Confusion is not an emotion. It is a cognitive disequilibrium state due to contradictory data. A confused student might be frustrated and he will seek more information. Motivated students will study more (Vogel & Schwabe, 2016).

Mild and acute stress enhance learning, while severe and chronic stress impairs learning and memory. Stress causes overactivity hypothalamic-pituitary-adrenal (HPA) axis. Attention enhance perceptual processing and organize information to higher brain functions and awareness. Curiosity encourages further exploration and stimulate the brain to learn and remember (Oudeyer et al., 2016).

Stimulating selective attention increases long term memory storage. It is associated with sensory pathways that are modulated by the frontal and parietal cortices. This is an indirect influence on perception and attention that regulates selective sensory processing and behavioral determination (Tyng et al., 2017).

Human sensory systems are not able to process everything at once. They need attentional mechanisms. Brain regions such as ventromedial prefrontal cortex and superior temporal sulcus, along with the primary visual cortex will help to realize

both emotion and conceptualization. Amygdala plays a crucial role in emotional processing. Insular cortex, the secondary somatosensory cortex, the cingulate cortex and nuclei in the tegmentum and hypothalamus regulate attentional focus to create emotional feeling states. Emotional are important in the process of encoding new information (Tyng et al., 2017).

Emotion Regulation

Mentoring programs, which pair youth with caring, non-parental adults with the goal of promoting positive youth development, are an increasingly popular strategy for early intervention with at-risk youth. However, important questions remain about the extent to which these interventions improve youth outcomes (Arnold & Cater, 2016).

Emotional well-being includes a cognitive appraisal of life satisfaction. It is related to happiness. The positive feelings are happiness and life satisfaction. Positive emotions are one of the pillars in Positive Psychology. A positive emotional well-being can be regulations of emotions. Emotional well-being includes positive subjective experience of the past, present, and future. Positive emotions strengthen

attention and thinking. Thus it will improve academic performance in students (Lamers et al., 2011).

Social Emotions and Interpersonal Relationship

Students' understanding is affected by their interpersonal relationship. Working a task in group will yield cooperation, enhance social skill, and increase emotional experience in learning process. The information that is studied in group will be retained longer than study alone (Heyward, 2010).

Emotionally Competence and Social Adjustment

Passionate abilities incorporate learning and aptitudes to comprehend and oversee feelings, accomplish objectives, keep positive connections, show sympathy and empathy for other people. These aptitudes are related with social, conduct and scholastic results. In any case, there remains an absence of learns about enthusiastic capabilities of young people inside the homeroom (Weissberg et al., 2015). Young people accentuate social prizes higher than grown-up (Ahmed et al., 2015).

CONCLUSION

Emotion fluctuates in adolescent. Emotional regulation is very essential to tackle the transition period smoothly. Brain is involved in the emotion regulation, learning, and memory. Giving adolescents some space to improve their abilities will enhance their emotional competencies. Academic performance will be better when adolescents can manage their emotion. Last but not least, teacher and parents role are very critical in supporting adolescents going through their adolescence phase.

REFERENCES

- Ahmed, S.P., Hewitt, A.B., Sebastian, C.L. (2015). Neurocognitive bases of emotion regulation development in adolescence. *Developmental Cognitive Neuroscience, 15*, 11–25.
- Arnold, M.E., Cater, M. (2016). From then to now: emerging directions for youth program evaluation. *Journal of Youth Development, 6*(3), 80–92.
- Bjork, J.M., Smith, A.R., Chen, G., Hommer, D.W. (2011). Psychosocial problems and recruitment of incentive neurocircuitry: Exploring individual differences in healthy adolescents. *Developmental Cognitive Neuroscience, 1*, 570–577.

- Borghuis, J., Denissen, J., Oberski, D., Sijtsma, K., Meeus, W., Branje, S., Koot, H.M., & Bleidorn, W. (2017). Big five personality stability, change, and codevelopment across adolescence and early adulthood. *Journal of Personality and Social Psychology, 113*(4), 641-657.
- Crede, J., Wirthwein, L., McElvany, N., Steinmayr, R. (2015). Adolescents' academic achievement and life satisfaction: The role of parents' education. *Frontiers in Psychology, 1*, 1-9.
- D'Mello, S., Lehman, B., Pekrun, R., and Graesser, A. (2014). Confusion can be beneficial for learning. *Learn. Instr.* 29, 153–170.
- Damasio, A., and Carvalho, G. B. (2013). The nature of feelings: evolutionary and neurobiological origins. *Nat. Rev. Neurosci.* 14, 143–152.
- Davenport, E., Yap, M.B.H., Simmons, J.G., Sheeber, L. B., Allen, B. N. (2011). Maternal and adolescent temperament as predictors of maternal affective behavior during mother–adolescent interactions. *Journal of Adolescence 34* (5), 829-839.
- Drury, S., & Giedd, J. (2009). Inside the adolescent brain. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*(7), 677-678.
- Ellis, W., & Zabatany, L. (2017). Understanding processes of peer clique influence in late childhood and early adolescence. *Child Development Perspectives, 11*, 227–232.
- Fairchild, G. (2011). The developmental psychopathology of motivation in adolescence. *Developmental Cognitive Neuroscience, 1* (4), 414-429.
- Farnsworth, J.K., Mannon, K.A., Sewell, K.W., Connally, M.L., Murrell, A.R. (2016). Exploration of caregiver behavior on fear of emotion, spirituality, and self-compassion. *Journal of Contextual Behavioral Science 5*, 160–168.
- Goddings, A., Burnett, S., Klapwijk, E., Bird, G., Viner, R., & Blakemore, S. (2012). The relationship between puberty and social emotion processing. *Archives of Disease in Childhood, 97*, A62-A63.
- Heller, A., Casey, B. (2016). The neurodynamics of emotion: Delineating typical and atypical emotional processes during adolescence. *Developmental Science, 19*(1), 3-18.
- Heyward, P. (2010). Emotional Engagement Through Drama: Strategies to assist

- learning through role-play. *International Journal of Teaching and Learning in Higher Education*, 22(2), 197-204.
- Jack, R.E., Schyns, P.G. (2015). The human face as a dynamic tool for social communication. *Curr. Biol.*, 25, R621–R634.
- Keefer, K. V. (2015). Self-report assessments of emotional competencies: A critical look at methods and meanings. *Journal of Psychoeducational Assessment*, 33(1), 3–23.
- Kuhnert, R.L., Begeer, S., Fink, E., & Rosnay, M. D. (2016). Gender-differentiated effects of theory of mind, emotion understanding, and social preference on prosocial behavior development: A longitudinal study. *Journal of Experimental Child Psychology*, 154(13), 27.
- Kuhnert, R.L., Begeer, S., Fink, E., & Rosnay, M. D. (2016). Gender-differentiated effects of theory of mind, emotion understanding, and social preference on prosocial behavior development: A longitudinal study. *Journal of Experimental Child Psychology*, 154(13), 27.
- Lam, C. B., Solmeyer, A. R., & McHale, S. M. (2012). Sibling relationships and empathy across the transition to adolescence. *Journal of Youth Adolescence*, 41, 1657–1670.
- Lamers, S. M. A., Westerhof, G. J., Bohlmeijer, E. T., Klooster, P. M., & Keyes, C. L. M. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of Clinical Psychology*, 67(1), 99–110.
- McLaughlin, K.A., Garrad, M.C., Somerville, L.H. (2015). What develops during emotional development? A component process approach to identifying sources of psychopathology risk in adolescence. *Clinical research*, 1, 403-410.
- Oudeyer, P.Y., Gottlieb, J., and Lopes, M. (2016). Intrinsic motivation, curiosity, and learning: theory and applications in educational technologies. *Prog.Brain Res.* 229, 257–284.
- Piotrowski, A.S., Singer, A., Patterson, M. (2015). The role of the teacher in children's peer relations: Making the invisible hand intentional. *Translational Osues in Psychological Science*, 1(2), 192–200.

- Poulou, M. S. (2016). An examination of the relationship among teachers' perceptions of social-emotional learning, teaching efficacy, teacher-student interactions, and students' behavioral difficulties. *International Journal of School & Educational Psychology*, 5(2), 126–136.
- Rose, A., & Asher, S. (2017). The social tasks of friendship: Do boys and girls excel in different tasks? *Child Development Perspectives*, 11, 3–8.
- Ruzek, E.A., Hafen, C.A., Allen, J.P., Gregory, A., Mikami, A.Y., Pianta, R.C. (2016). How teacher emotional support motivates students: The mediating roles of perceived peer relatedness, autonomy support, and competence. *Learning and Instruction* 42, 95-103.
- Sheppes, G., Suri, G., Gross, J.J. (2015). Emotion regulation and psychopathology. *Annu. Rev. Clin. Psychol.* 11, 379–405.
- Shulman, S., Scharf, M. (2018). Adolescent psychopathology in Times of Change: The need for integrating a developmental psychopathology perspective. *Journal of adolescence*, 65, 95-100.
- Smith, S., Dutcher, K., Askar, M., Talwar, V., Bosacki, S. (2019). Emotional competencies in emerging adolescence: relations between teacher ratings and student self-reports. *International Journal of Adolescence and Youth*, 24, 19-28.
- Theurel, A., Gentaz, E. (2018). The regulation of emotions in adolescents: Age differences and emotion-specific patterns. *PLoS ONE* 13(6): 1-24.
- Tyng, C.M., Amin, H.U., Saan, M.N.M., Malik, A.S. (2017). The Influences of Emotion on Learning and Memory. *Front.Psychol*, 8, 1-22.
- Um, E., Plass, J. L., Hayward, E. O., and Homer, B. D. (2012). Emotional design in multimedia learning. *J. Educ. Psychol.* 104, 485–498. doi: 10.1037/a0026609
- Valle, A., Massaro, D., Castelli, I., & Marchetti, A. (2015). Theory of mind development in adolescence and early adulthood: the growing complexity of recursive thinking ability. *Europe's Journal of Psychology*, 11(1), 112–124.
- Veale, D., Gilbert, P., Wheatley, J., & Naismith, I. (2015). A new therapeutic community: development of a

compassion-focused and contextual behavioral environment. *Clinical Psychology & Psychotherapy*, 22(4), 285–303.

Vogel, S., and Schwabe, L. (2016). Learning and memory under stress: implications for the classroom. *Sci. Learn.* 1, 1–10.

Weissberg, R. P., Durlak, J. A., Domitrovich, C. E., & Gullotta, T. P. (2015). Social and emotional learning: Past, present, and future. In J. A. Durlak, C. E. Domitrovich, R. P. Weissberg, & T. P. Gullotta (Eds.), *Handbook of social and emotional learning: Research and practice* (pp. 3–19). New York, NY: Guilford.